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# ATTACHMENTS

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## **Development and Infrastructure Services Committee Meeting**

**9 August 2017**

6.00pm

City of Albany Council Chambers

DEVELOPMENT AND INFRASTRUCTURE SERVICES COMMITTEE  
ATTACHMENTS – 09/08/2017

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## Report

# Avian fauna at Mullocullop Nature Reserve

by

**Anne Bondin  
(Feb 2016)**



*Lake Mullocullop*

At the request of the City of Albany research was conducted to obtain information about the birdlife using the lake contained within Mullocullop Nature Reserve.

The lake which appears to be known by a number of different names is in this report referred to as Mullocullop Lake. It forms a fairly large part of the 115.65 ha Mullocullop Nature Reserve located off Warriup Road in the Green Range area of the City of Albany. A small part of the lake is on adjacent private property. According to a report published by the Department of Water in June 2008 the water in the lake is brackish to moderately saline with generally low nutrient levels. The report also cites a potential for toxic algae blooms to occur during summer which may have a negative effect on the lake's birdlife.

It is one of the few larger lakes within the municipal boundaries of the City of Albany providing habitat for a wide range of waterbirds. The bushland surrounding the lake contains a variety of vegetation types and is home to many species of bushbirds.

Whilst the lake is not ranked as a wetland of national importance (only 120 wetlands in WA fulfill that criteria), it is important as a local refuge for waterbirds given that only three larger lakes exist between Two Peoples Bay Nature Reserve and the Pallinup River. Of the three lakes,

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Mullocullop Lake hosts by far the largest number of waterbirds.

The number of bird species recorded at the reserve between 2000 – 2016 is 91, which is nearly half of all the bird species found within the Albany region. 30 of the species recorded in the reserve are classified as waterbirds and depend on the lake for their habitat requirements.

The lake is not a migratory shorebird site as it lacks the extensive mudflats those birds require for feeding. During the two surveys the lake was nearly full with almost no shoreline available for shorebirds. Over the years there was only one record of a migratory shorebird visiting the lake.

The lake also appears unsuitable for the endangered Australasian Bittern as it lacks the dense beds of reeds and rushes preferred by the species.

The surveys conducted at the beginning and end of the summer 2015/16 can only ever provide a snapshot of the birdlife of the lake.

During the early summer survey a total of 349 water birds were recorded. At the end of summer the number of waterbirds had dropped to 215. The nomadic nature of waterbirds is the most likely explanation for the drop in numbers. However, disturbance of the birds by recreational motorised watercraft used on the lake during the summer months (pers. communication Jane Jeffreys, owner of adjacent property) cannot be completely ruled out and may also have played a role in the decline. Eleven species of waterbirds were recorded in December. By February the number of different species had increased to 14.

As is the case with the majority of Australian lakes, waterbird numbers on Mullocullop Lake will show constant variations as will the number of the species present. Due to the ephemeral nature of many wetlands the majority of Australian waterbirds is highly nomadic, opportunistically seeking out habitat suitable for both feeding and breeding. Had a survey for example been conducted prior to the widespread rainfall in the region in late January, it is very likely to have provided evidence of a higher waterbird presence. Several lakes near Albany including Lake Seppings and Lake Powell recorded a significant drop in waterbird numbers in the weeks following the January rains with birds presumably having moved on to inland wetlands now containing water.

Given the limited scope of the surveys no specific searches for waterbird breeding sites were carried out. However, the lake was found to contain a number of paperbarks with cormorant nests. An active nest containing three young Little Black Cormorants was discovered during the December survey.

During the December survey the most common waterbird species recorded were Hoary-headed Grebes, Australian Shelducks, Pacific Black Ducks and Musk Ducks. During the end-of-summer survey there was a significant drop in the number of grebes and shelducks had virtually disappeared from the lake, however, both Musk Ducks and Pacific Black Ducks were still ranking amongst the most common species. Australian Wood Ducks seen on the private property at the northern end of the lake were the most common waterbird species recorded in February.

It is likely that a variety of ducks, including the Australian Shelduck, use the lake during their moult period which generally last about a month during summer, a time when the birds are flightless until their flight and tail feathers have regrown. During the February survey only a fraction of the shelducks encountered during the December survey were seen on the lake. By then the ducks had presumably completed their moult and left.

Apart from Carnaby's Black Cockatoos no threatened species were recorded at the reserve. The cockatoos were not recorded on a regular basis which indicates that they may only be passing through occasionally. No cockatoos were recorded during the surveys carried out this summer. There were also no suitable trees with nest hollows available for cockatoos.

**Species list Mullocullop Nature Reserve**

(based on taxonomy Christides & Boles 2008)

**GALLIFORMES**

**Phasianidae**

*Coturnix ypsilophora* Brown Quail

**ANSERIFORMES**

**Anatidae**

<i>Biziura lobata</i>	Musk Duck
<i>Cygnus atratus</i>	Black Swan
<i>Tadorna tadornoides</i>	Australian Shelduck
<i>Chenonetta jubata</i>	Australian Wood Duck
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck
<i>Anas rhynchotis</i>	Australasian Shoveler
<i>Anas gracilis</i>	Grey Teal
<i>Anas castanea</i>	Chestnut Teal
<i>Anas superciliosa</i>	Pacific Black Duck
<i>Aythya australis</i>	Hardhead
<i>Oxyura australis</i>	Blue-billed Duck

**PODICIPEDIFORMES / GREBES**

**Podicipedidae**

<i>Tachybaptus novaehollandiae</i>	Australasian Grebe
<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe

**COLUMBIFORMES**

**Columbidae**

<i>Phaps chalcoptera</i>	Common Bronzewing
<i>Phaps elegans</i>	Brush Bronzewing
<i>Ocyphaps lophotes</i>	Crested Pigeon

**APODIFORMES / SWIFTS**

**Aegothelidae**

<i>Aegotheles cristatus</i>	Australian Owlet-nightjar
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**PHALACROCORACIFORMES**

**Phalacrocoracidae**

<i>Microcarbo melanoleucos</i>	Little Pied Cormorant
<i>Phalacrocorax carbo</i>	Great Cormorant
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant
<i>Phalacrocorax varius</i>	Pied Cormorant

**CICONIIFORMES**

**Pelecanidae**

<i>Pelecanus conspicillatus</i>	Australian Pelican
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**Ardeidae**

<i>Egretta novaehollandiae</i>	White-faced Heron
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# REPORT ITEM DIS035 REFERS

## **Threskiornithidae**

*Threskiornis molucca*  
*Platalea flavipes*

Australian White Ibis  
Yellow-billed Spoonbill

## **ACCIPITRIFORMES**

### **Accipitridae**

*Elanus axillaris*  
*Lophoictinia isura*  
*Haliastur sphenurus*  
*Accipiter fasciatus*  
*Accipiter cirrhocephalus*  
*Circus approximans*  
*Aquila audax*  
*Hieraaetus morphnoides*

Black-shouldered Kite  
Square-tailed Kite  
Whistling Kite  
Brown Goshawk  
Collared Sparrowhawk  
Swamp Harrier  
Wedge-tailed Eagle  
Little Eagle

## **FALCONIFORMES**

### **Falconidae**

*Falco longipennis*

Australian Hobby

## **GRUIFORMES**

### **Rallidae**

*Porphyrio porphyrio*  
*Porzana tabuensis*  
*Fulica atra*

Purple Swamphen  
Spotless Crake  
Eurasian Coot

## **CHARADRIIFORMES**

### **Charadriidae**

*Charadrius ruficapillus*  
*Elseyornis melanops*  
*Thinornis rubricollis*  
*Vanellus tricolor*

Red-capped Plover  
Black-fronted Dotterel  
Hooded Plover  
Banded Lapwing

### **Scolopacidae**

*Calidris acuminata*

Sharp-tailed Sandpiper\*\*

### **Laridae**

*Chlidonias hybridus*

Whiskered Tern

## **PSITTACIFORMES**

### **Cacatuidae**

*Calyptorhynchus latirostris*  
*Eolophus roseicapillus*

Carnaby's Black-Cockatoo\*  
Galah

### **Psittacidae**

*Glossopsitta porphyrocephala*  
*Polytelis anthopeplus*  
*Platycercus icterotis*  
*Barnardius zonarius*  
*Purpureicephalus spurius*  
*Neophema elegans*

Purple-crowned Lorikeet  
Regent Parrot  
Western Rosella  
Australian Ringneck  
Red-capped Parrot  
Elegant Parrot

## **CUCULIFORMES**

### **Cuculidae**

*Chalcites lucidus*  
*Cacomantis flabelliformis*

Shining Bronze-Cuckoo  
Fan-tailed Cuckoo

**STRIGIFORMES**

**Strigidae**

*Ninox novaeseelandiae* Southern Boobook

**CORACIIFORMES**

**Halcyonidae**

*Dacelo novaeguineae* Laughing Kookaburra\*\*\*  
*Todiramphus sanctus* Sacred Kingfisher

**PASSERIFORMES**

**Maluridae:**

*Malurus splendens* Splendid Fairy-wren  
*Malurus elegans* Red-winged Fairy-wren

**Acanthizidae**

*Sericornis frontalis* White-browed Scrubwren  
*Gerygone fusca* Western Gerygone  
*Acanthiza apicalis* Inland Thornbill  
*Acanthiza chrysorrhoa* Yellow-rumped Thornbill

**Pardalotidae**

*Pardalotus punctatus* Spotted Pardalote

**Meliphagidae**

*Acanthorhynchus superciliosus* Western Spinebill  
*Anthochaera lunulata* Western Wattlebird  
*Anthochaera carnunculata* Red Wattlebird  
*Lichmera indistincta* Brown Honeyeater  
*Phylidonyris novaehollandiae* New Holland Honeyeater  
*Melithreptus lunatus* White-naped Honeyeater

**Neosittidae**

*Daphoenositta chrysoptera* Varied Sittella

**Campephagidae**

*Coracina novaehollandiae* Black-faced Cuckoo-shrike

**Pachycephalidae**

*Pachycephala pectoralis* Golden Whistler  
*Colluricincla harmonica* Grey Shrike-thrush

**Artamidae**

*Artamus cyanopterus* Dusky Woodswallow  
*Cracticus torquatus* Grey Butcherbird  
*Cracticus tibicen* Australian Magpie  
*Strepera versicolor* Grey Currawong

**Ripiduridae**

*Rhipidura albiscapa* Grey Fantail  
*Rhipidura leucophrys* Willie Wagtail

**Corvidae**

*Corvus coronoides* Australian Raven

**Monarchidae**

*Myiagra inquieta* Restless Flycatcher  
*Grallina cyanoleuca* Magpie-lark

**Petroicidae**

*Petroica boodang* Scarlet Robin  
*Eopsaltria georgiana* White-breasted Robin

## REPORT ITEM DIS035 REFERS

### **Acrocephalidae**

*Acrocephalus stentoreus* Australian Reed-Warbler

### **Timaliidae**

*Zosterops lateralis* Silvereeye

### **Hirundinidae**

*Hirundo neoxena* Welcome Swallow  
*Petrochelidon nigricans* Tree Martin

### **Estrildidae**

*Stagonopleura oculata* Red-eared Firetail

### **Motacillidae**

*Anthus novaeseelandiae* Australasian Pipit

Data is based on surveys carried out by members of the Albany Bird Group between 2000 – 2016.

Surveys were carried out at various times of the year, but mainly between spring and autumn. All surveys were conducted during daytime hours which may have limited the opportunity of recording species active at night.

Species listed as threatened under either state or federal legislation are marked with an asterisk

Migratory species protected under federal legislation are marked with a double asterisk

Introduced species are marked with a triple asterisk



**Taxonomic species list for Mullocullop Nature Reserve  
survey date 1 December 2015**

**ANSERIFORMES****Anatidae**

<i>Biziura lobata</i>	Musk Duck (51)
<i>Tadorna tadornoides</i>	Australian Shelduck (44)
<i>Chenonetta jubata</i>	Australian Wood Duck (3)
<i>Anas gracilis</i>	Grey Teal (2)
<i>Anas superciliosa</i>	Pacific Black Duck (34)
<i>Oxyura australis</i>	Blue-billed Duck (2)

**PODICIPEDIFORMES / GREBES****Podicipedidae**

<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe (172)
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**COLUMBIFORMES****Columbidae**

<i>Phaps elegans</i>	Brush Bronzewing
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**PHALACROCORACIFORMES****Phalacrocoracidae**

<i>Microcarbo melanoleucos</i>	Little Pied Cormorant (13)
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant (5)

**GRUIFORMES****Rallidae**

<i>Porzana tabuensis</i>	Spotless Crake (2)*
<i>Fulica atra</i>	Eurasian Coot (21)

**ACCIPITRIFORMES****Accipitridae**

<i>Accipiter fasciatus</i>	Brown Goshawk
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**PSITTACIFORMES****Cacatuidae**

<i>Eolophus roseicapillus</i>	Galah
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**Psittacidae**

<i>Platycercus icterotis</i>	Western Rosella
<i>Barnardius zonarius</i>	Australian Ringneck

**CUCULIFORMES****Cuculidae**

<i>Chalcites lucidus</i>	Shining Bronze-Cuckoo
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**PASSERIFORMES****Maluridae:**

<i>Malurus splendens</i>	Splendid Fairy-wren
<i>Malurus elegans</i>	Red-winged Fairy-wren

## REPORT ITEM DIS035 REFERS

### **Acanthizidae**

<i>Sericornis frontalis</i>	White-browed Scrubwren
<i>Gerygone fusca</i>	Western Gerygone
<i>Acanthiza apicalis</i>	Inland Thornbill
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill

### **Meliphagidae**

<i>Acanthorhynchus superciliosus</i>	Western Spinebill
<i>Anthochaera lunulata</i>	Western Wattlebird
<i>Anthochaera carnunculata</i>	Red Wattlebird
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater
<i>Melithreptus lunatus</i>	White-naped Honeyeater

### **Campephagidae**

<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike
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### **Pachycephalidae**

<i>Pachycephala pectoralis</i>	Golden Whistler
<i>Colluricincla harmonica</i>	Grey Shrike-thrush

### **Artamidae**

<i>Cracticus tibicen</i>	Australian Magpie
<i>Strepera versicolor</i>	Grey Currawong

### **Ripiduridae**

<i>Rhipidura albiscapa</i>	Grey Fantail
<i>Rhipidura leucophrys</i>	Willie Wagtail

### **Corvidae**

<i>Corvus coronoides</i>	Australian Raven
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### **Monarchidae**

<i>Myiagra inquieta</i>	Restless Flycatcher
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### **Acrocephalidae**

<i>Acrocephalus stentoreus</i>	Australian Reed-Warbler
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### **Timaliidae**

<i>Zosterops lateralis</i>	Silvereye
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### **Hirundinidae**

<i>Hirundo neoxena</i>	Welcome Swallow
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### **Estrildidae**

<i>Stagonopleura oculata</i>	Red-eared Firetail
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The survey was conducted during daytime hours which would have limited the opportunity of recording species active at night.

As the survey was conducted on foot along the lake's shoreline rather than by boat, there is a possibility that a small number of waterbirds may have been missed in the count.

\*Spotless Crakes, a very elusive species, were identified by their call. It is very likely that the number of crakes living at the lake is higher than what was recorded.

**Taxonomic species list for Mullocullop Nature Reserve  
survey date 25 February 2016**

**ANSERIFORMES****Anatidae**

<i>Biziura lobata</i>	Musk Duck (25)
<i>Chenonetta jubata</i>	Australian Wood Duck (36)
<i>Anas gracilis</i>	Grey Teal (8)
<i>Anas superciliosa</i>	Pacific Black Duck (25)
<i>Aythya australis</i>	Hardhead (2)
<i>Oxyura australis</i>	Blue-billed Duck (2)

**PODICIPEDIFORMES / GREBES****Podicipedidae**

<i>Tachybaptus novaehollandiae</i>	Australasian Grebe (1)
<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe (32)

**COLUMBIFORMES****Columbidae**

<i>Phaps elegans</i>	Brush Bronzewing
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**PHALACROCORACIFORMES****Phalacrocoracidae**

<i>Microcarbo melanoleucos</i>	Little Pied Cormorant (10)
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant (16)

**CICONIIFORMES****Ardeidae**

<i>Egretta novaehollandiae</i>	White-faced Heron (2)
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**Threskiornithidae**

<i>Threskiornis molucca</i>	Australian White Ibis (5)
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**GRUIFORMES****Rallidae**

<i>Porzana tabuensis</i>	Spotless Crake (4)*
<i>Fulica atra</i>	Eurasian Coot (47)

**PSITTACIFORMES****Cacatuidae**

<i>Eolophus roseicapillus</i>	Galah
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**Psittacidae**

<i>Platycercus icterotis</i>	Western Rosella
<i>Barnardius zonarius</i>	Australian Ringneck

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<i>Malurus splendens</i>	Splendid Fairy-wren
<i>Malurus elegans</i>	Red-winged Fairy-wren

## REPORT ITEM DIS035 REFERS

### **Acanthizidae**

<i>Sericornis frontalis</i>	White-browed Scrubwren
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<i>Acanthiza apicalis</i>	Inland Thornbill

### **Meliphagidae**

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<i>Strepera versicolor</i>	Grey Currawong

### **Ripiduridae**

<i>Rhipidura albiscapa</i>	Grey Fantail
<i>Rhipidura leucophrys</i>	Willie Wagtail

### **Corvidae**

<i>Corvus coronoides</i>	Australian Raven
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### **Monarchidae**

<i>Myiagra inquieta</i>	Restless Flycatcher
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### **Petroicidae**

<i>Eopsaltria georgiana</i>	White-breasted Robin
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### **Acrocephalidae**

<i>Acrocephalus stentoreus</i>	Australian Reed-Warbler
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### **Timaliidae**

<i>Zosterops lateralis</i>	Silvereye
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### **Hirundinidae**

<i>Hirundo neoxena</i>	Welcome Swallow
<i>Petrochelidon nigricans</i>	Tree Martin

### **Estrildidae**

<i>Stagonopleura oculata</i>	Red-eared Firetail
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As the survey was conducted on foot along the lake's shoreline rather than by boat, there is a possibility that a small number of waterbirds may have been missed in the count.

\*Spotless Crakes, a very elusive species, were identified by their call. It is very likely that the number of crakes living at the lake is higher than what was recorded.



# Great Southern Institute of Technology

## 'Mireembin Lake' Ecology Report Warriup Road, Green Range

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By: Conservation and Land Management Cert. IV Students, July 2014  
Tutor: Sylvia Leighton  
Students: Terran Ablett, Jenny Loveland, Courtenay Richards, Nathan Sandall,  
Sonja van Thiel, Leah Varcoe, Gabriel Verdier

**Supported By:**



Department of  
Parks and Wildlife





**Acknowledgements:**

Anne Bondin (Birds Australia) for supplying important bird records for Swan Lake  
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Leah Goodrem (CLM Coordinator) - Great Southern Institute of Technology  
Jane Jeffries (Landholders) – Giving permission for the students to canoe onto their property  
Andy Morrison (Mapping Specialist) – Great Southern Institute of Technology  
Andrew Nicholson (Water Measurements) - Great Southern Institute of Technology  
Nicoli Sykora (Department of Water) – assisting with important reference material  
Alexandra Tucker (City of Albany) – background information on Swan Lake  
Sonja van Thiel – for all her wonderful formatting and word document skills

Satellite images courtesy of Google Earth and Landgate WA.

All unacknowledged photos in this report were taken by Sylvia Leighton and cannot be transferred into any other documents without permission.

**Front page picture:**

View in a south-easterly direction over Mirembin Lake with Warriup Hill in the background.

## Executive Summary

Great Southern Institute of Technology Conservation and Land Management Certificate IV students undertook a ‘snapshot’ ecological survey of Mireembin Lake on the southern end of Warriup Rd., Green Range, Western Australia, in response to public request. Assistance was provided by the *Land For Wildlife* programme at the Department of Parks and Wildlife (DPaW), Albany, as Mireembin Lake is in the near vicinity of two properties registered with the (DPaW), *Land For Wildlife* programme.

The Noongar name of ‘Mireembin’ for The Lake means ‘place of turtle’ (pers. comm. L. Knapp, 2014). Creator spirit stories are associated with the Lake (pers. comm. C. Petterson, 2014). A full indigenous heritage survey for the lake and the surrounds is required.

The Mireembin Lake Ecological Survey presents the results for; a water depth survey, water quality measurements, lake edge flora survey and any background reference data that has been collected in the past for the site.

Mireembin Lake has an area of 57ha and is vested with the City of Albany in the Mullocullop Nature Reserve: “For The Purpose of Water, Camping and Conservation of Flora and Fauna”. Mireembin Lake is located in the vicinity of the junction of two recognised Interim Biogeographic Regions of Australia (IBRA) zones; Jarrah Forest & the Esperance Plain. The vegetation surrounding the lake is reflective of this influence.

A bird species list for the Mullocullop Nature Reserve was compiled from observations made by the Albany Bird Group between 2000 - 2011. Some of the species observed near Mireembin Lake include the Red-capped Plover, Hooded Plover, Sharp-tailed Sandpiper all of which are protected under the Environmental Protection and Biodiversity Conservation (EPBC) Act.

Mireembin Lake is also in the vicinity of the Cheyne Road wetlands suite which provide important wetland habitat for the extremely rare Australasian Bittern (*Botaurus poiciloptilus*). This species is protected by the Western Australian Wildlife Conservation Act 1950 and listed as ‘Fauna that is rare or is likely to become extinct’ as recommended by the International Union for Conservation of Nature criteria for assigning species and communities to threat categories.

It is hoped that the future management of Mireembin Lake incorporates special protection for this unique wetland area of Green Range on the south coast of Western Australia.





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## 1.0 Introduction

### 1.1 Location

'Mireembin Lake' is located about 70 kilometres north east of Albany on the South Coast of Western Australia. The Lake can be accessed by driving east on Warriup Road. The Lake is at the south eastern end of the road near the southern coast. The Lake is accessed via a car and boat access area at the southern end of The Lake. The majority of Mireembin Lake sits inside Mullocullup Nature Reserve which has a reserve number: R16367 and was gazetted in 1981. The City of Albany has the management order for this 57ha reserve. It is a C class reserve: "For the Purpose of Water, Camping and Conservation of Flora and Fauna".

A north eastern arm of the water body is actually located on private property: P251218 (loc. 376 which is 40.5 ha in size). This property is a significant historical site as it contains the Hassell Family Farm Homestead located about 150 metres from the water's edge of Mireembin Lake. This old farm is one of the first titles settled by Europeans in the Green Range area.

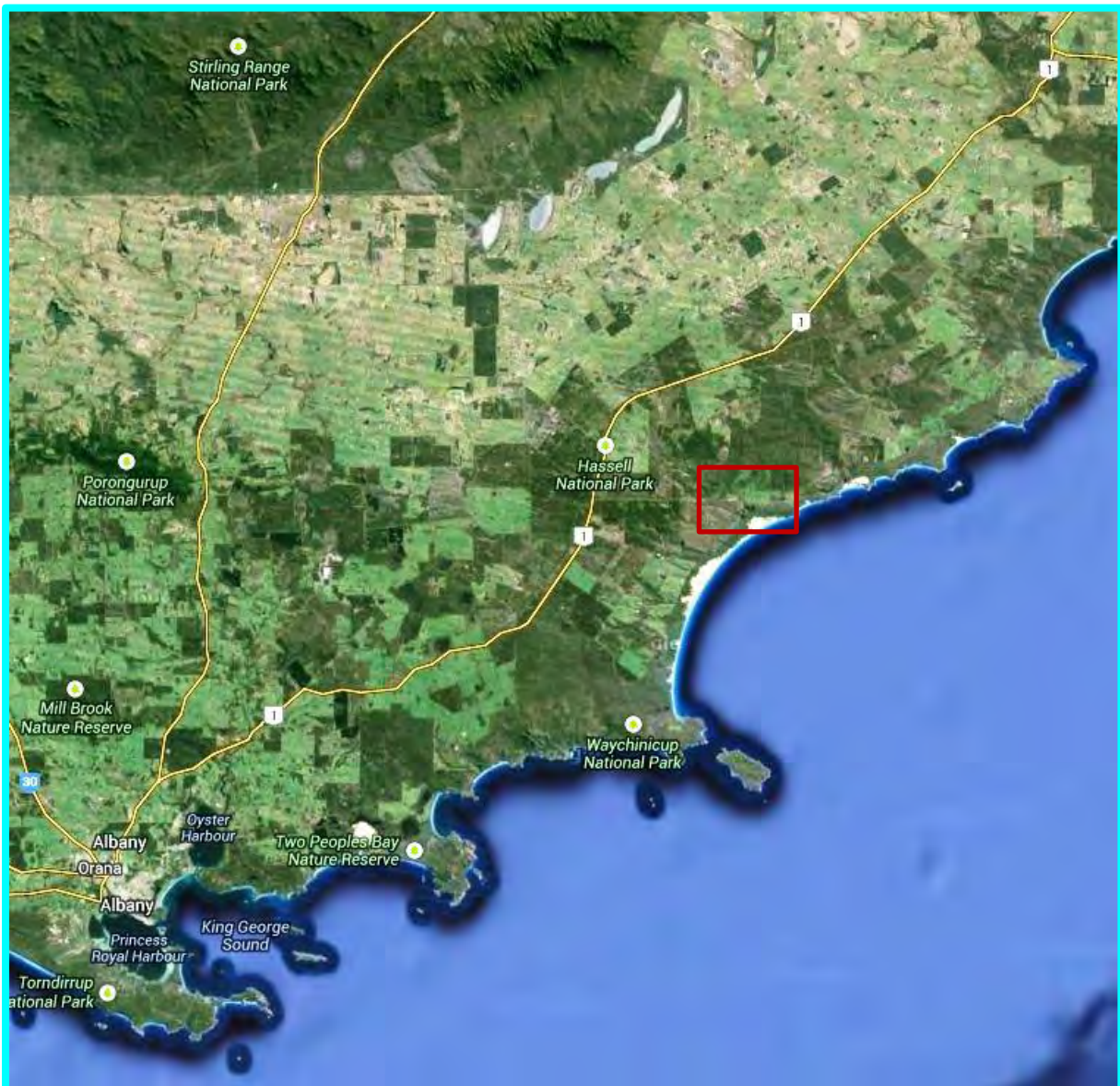


Figure 1: Mireembin Lake location in South Coast region



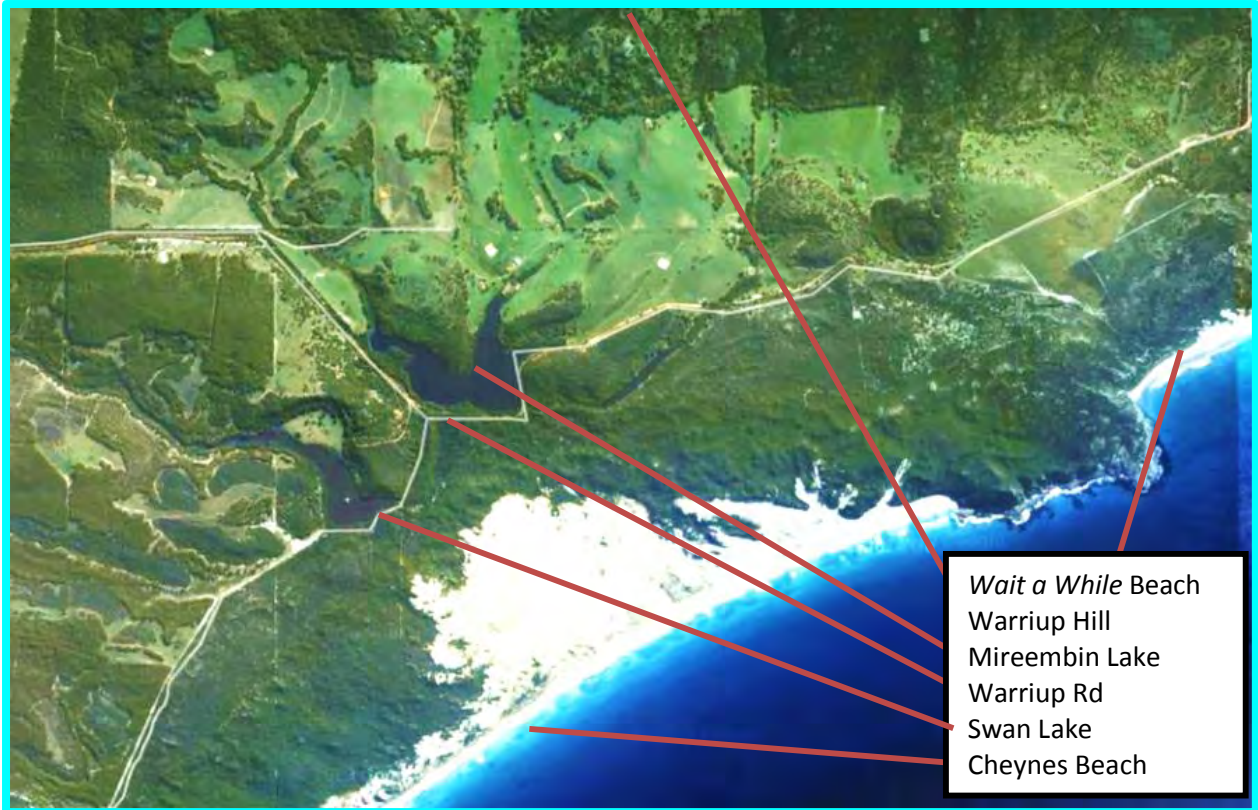


Figure 2: Mireembin Lake in relation to surrounding landmark features

The Great Southern Institute of Technology decided to measure some of the ecological parameters of the lake and research any background reference material. This was in response to concerns from an adjoining *Land For Wildlife* landholder who was concerned about the increasing public recreational usage of the lake. This report will be submitted to the City of Albany to assist them with future management of Mireembin Lake. There is another smaller lake to the south west of Mireembin Lake. However, this other lake is wholly located on a private property title and much more difficult to gain access.



Figure 3: The water body of Mireembin Lake has two land titles that sit across its boundaries: R16367 & P251218

## 1.2 Geology and Geomorphology

Mireembin Lake sits within a regional scale geomorphic unit identified as the *Hassell Beach-Bremer Bay Coastal Zone* (Semeniuk, V. & C., 1998). This is identified as a coastal complex of local headlands, small inlets, short drainage lines, long sweeping beaches and barrier dunes

The regional geology has a major influence on the pattern of landforms in the area. Mireembin Lake has the Precambrian gneiss/granite hills (approx. 1200 million years ago) of Green Range bordering its eastern side from which most of its recharge water catchment flows. Plantagenet Siltstone is another geological rock unit which outcrops on the edges of the lake and influence the form and shape of Mireembin Lake. Plantagenet Group sediments sit on top of the older granite gneissic rocks and were deposited in the Late Eocene (about 40 million years ago) and are formed from marine based sediments during past higher sea level fluctuations.



Figure 4: Outcropping granites on the western side of Mireembin Lake



Figure 5: Plantagenet Siltstone forming steep banks on Mireembin Lake

The Lake has steep banks where it adjoins outcropping areas of Plantagenet Siltstone rocks. The slopes are less steep where the water body adjoins low lying sediment accumulation banks. To the south of the lake there are Pleistocene & Holocene barrier coastal sand dunes. At this stage it is not known how/if water discharges from Mireembin Lake to the coast through the land barriers. The valley tract systems in the area are underlain by sediments such as sand, mud and peat.

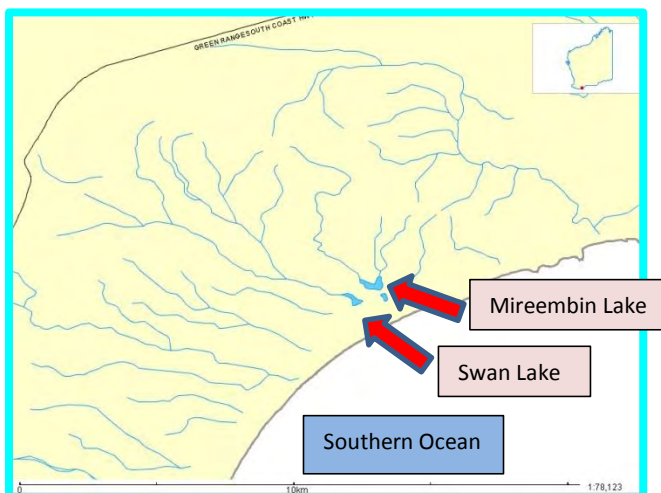


Figure 6: The hydrological network of creeklines in the vicinity of Mireembin Lake blocked off from the coast by sand dune barriers





Figure 7: The Pleistocene & Holocene barrier coastal dunes to the south of Mireembin Lake adjoining Cheyne's Beach

### 1.3 Climate

Examining present day climate and climate history is important to understanding the characteristics of our local wetlands. Wetlands in the southcoast region are strongly influenced by climate. Rainfall, evaporation and wind strongly influence wetland hydrology, wetland formation and evolution of landform. Mireembin Lake is located in a part of the state that experiences a typically Mediterranean climate in relation to precipitation, evaporation, temperature and wind. Mireembin Lake experiences an average of about 700mm annual rainfall with evaporation around 800mm/year classifying it as subhumid to humid (Gentilli, 1972).

Many of the southcoast wetlands were formed in earlier arid stages in the Cainozoic and now exist in fairly humid climate regimes. Wind in the coastal zone has been an important influence in developing coastal landforms and their accompanying distinctive wetlands. Wind generate waves in standing lakes like Mireembin Lake and these waves effect sediment winnowing, transport and the development of sand bars and peripheral sand ridges(Semeniuk , 1988). Aerial images indicate Mireembin Lake has submerged sediment banks in its northern and eastern edges.

## 1.4 Hydrology

Many wetlands in the southcoast region of WA have been grouped into Consanguineous Suites (Semeniuk, 1988). These inter-related wetlands have a similarity in geomorphic, geologic & hydrologic settings. One such suite is called the 'Swan Lake Suite' and includes our target wetland on the western side of Green Range adjacent to the coast. The Swan Lake Suite are representative of wetlands within Tertiary Rock settings. These wetlands are located in valleys and usually exhibit irregular branching shape, oriented north west to south east and can be micro to macro in scale. They are barred from the ocean by a Holocene or Pleistocene dune barrier and are therefore classified as closed. They are bordered by steep slopes cut into Pallinup Siltstone, granite and limestone. The water is sometimes hypo saline (Hodgkin and Clark, 1990).

The major drainage line of Mullocullop Creek enters the lake from the north west of the lake, and three other creek lines enter from the north, north east and easterly directions (refer to Fig. 8).



Figure 8: Four major creeklines flow into Mireembin Lake from the north west , north, north east and easterly directions.

## 1.5 Flora and Fauna

### 1.51 Flora

Mireembin Lake has a direct vegetation link to the Cheyne Beach Coastal Reserve which is an important corridor connection between Waychinicup National Park through to Fitzgerald River National Park. The Lake sits within a significant botanical area as it is located on the boundary of two biogeographic regions (IBRA) and has representative plant species from both botanical districts.

Fourteen Priority Flora have been located within a 10 kilometre radius to the Swan Lake catchment; *Banksia brownii* (Feather-leaved Banksia) **T**, *Calothamnus robustus* **P3**, *Chordifex abortivus* **T**, *Eucalyptus acies* (Woolburnup Mallee) **P4**, *Eucalyptus goniantha subsp. goniantha* (Jerdacuttup Mallee) **P4**, *Grevillea tetragonoloba* **P2**, *Hakea lasiocarpa* **P3**, *Jacksonia calycina* **P4**, *Leucopogon elegans ssp psorophyllus* **P3**, *Melaleuca micromera* **P3**, *Prostanthera verticillaris* **P1**, *Stenanthemum sublineare* **P2**, *Stylidium daphne* **P2**

(Extracted from *Naturemap*, 2014. A detailed description of these species is presented in Appendix 1 with a definition of the Priority Coding).



### 1.52 Fauna

A bird species list for the Mullocullop Nature Reserve (entire reserve) was compiled from observations made by the Albany Bird Group between 2000 – 2011 (appendix 2). No surveys other than recordings placed into the Atlas of Australian Birds database have ever been conducted at the reserve. A number of significant bird species such as the peregrine falcon, the wedge tailed eagle, sea eagle, Carnaby’s cockatoo, Red tailed Black Cockatoo and the Baudins Cockatoo are recorded in the area.

Some of the species observed at Swan Lake such as the Red-capped Plover, Hooded Plover, Sharp-tailed Sandpiper are protected under the EPBC Act. Swan Lake is also in the vicinity of the Cheyne Road wetlands which provide important wetland habitat for the extremely rare Australasian Night Bittern. This species is in need of protection and is listed as Declared Rare Fauna on the Wildlife Conservation Act 1950. These wetlands may occasionally provide habitat for some of the international migratory wader bird species but the lake does not provide the tidal banks they require.



Figure 9: *Botaurus poiciloptilus* Australasian Bittern (Photo courtesy Birds Australia)



Figure 10: *Calidris acuminata* Sharp Tailed Sandpiper (Photo courtesy Birds Australia)

A comprehensive fauna survey has been carried out on Benmore Farming Property about 10 kilometers westward along Warriup Road (details can be sought from *Land for Wildlife*, DPaW)). This survey made the following recordings:

- Mammals - pygmy possums, honey possums and southern brown bandicoot
- Reptiles - 10 skink species , one goanna species and four snake species
- Amphibians - Bleating Froglet, Clicking frog, Banjo frog, Motorbike frogs, Slender Tree frogs, Quacking frog, Spotted Thigh Frog, Leah’s Frog, Gunther’s Toadlet, Moaning Frog
- Avifauna - 38 species of birds were recorded

Some other mammals that have been recorded on other neighbouring properties include; brush tailed possum, brush tailed wallaby, yellow footed antechinus, dunnarts and quite a few species of bat. It is possible that the Swan Lake also forms part of a home range for other rare or threatened wildlife. The following ‘Priority’ fauna are found in the area: *Hydromys chrysogaster* (Water-rat) (P4), Quokka (DRF– small possibility), Western Quoll (unlikely but Green Range has a recording for 2002), Western Ring Tailed Possums (DRF) – used to occur on the Hassell Farming Property in the 1940’s (pers.comm. B. Hassell, 2013).



## 1.6 History

### 1.61 Indigenous

The Noongar name of 'Mireembin' for the Lake means 'place of turtle' (pers. comm. L. Knapp, 2014). Creator spirit stories are associated with the Lake (pers. comm. C. Petterson, 2014). Unfortunately there is very little ethnographic information recorded about the lives and culture of the *Menang* Noongar People in the Green Range area. Recently published Dreaming stories provide an explanation for how the southcoastland was created and include rituals and ceremonies which ensured the land and its resources would be continually renewed. A full indigenous heritage survey for the lake and the surrounds is required.

During a community workshop held in 2011 at *Wait-A-While* Beach, local Menang Indigenous Elders informed participants that the Warriup Hill & Mireembin Lake area was significant country to their ancestors. Carol Peterson stated that her mother was born on 'Kathleen/Well Creek'. Carol stated that her grandmother used to walk from Israelite bay to Albany through this country. Lynette Knapp stated that this country was 'blood country' to her grandmother. Lynette had brought her father out to look at Swan Lake before he passed over. The Knapp/Coyne family claim long connection to this land and have the native title claim in this area.

The Hassell family said that the Warriup Hill farming property had regular Menang families staying at the property where they would provide shepherding/shearing services and would be paid with food. It was stated that they visited 'seasonally' and these families would move on along the coast (Hassell. B., pers. Comm., 2013)



Figure 11: GSIT Certificate IV students at a possible 'significant' site

The GSIT students examined an aeolian eroded granite boulder (this is quite an unusual feature for this part of the south coast). The rock is located only about 200 metres to the west of the lake. It had an old fireplace inside it and was definitely rain proof. The students intend to do a 'site visit' with Noongar representative, Larry Bligh, to record important indigenous cultural features of the site.

### 1.62 European

Cooper was the name of the settler who lived on the first land title released before 1870 in the Warriup Hill area. The title was sold to John Wray in 1870. Wray built the first stone house on the Warriup property. In 1895 John Hassell became the owner of the Warriup property. John Hassell eventually sold Warriup to his brother Albert. The Hassell family lived on the Warriup Hill property right up to the 1990's.



Figure 12: The old Hassell Homestead located on the eastern arm of Mireembin Lake

## 2.0 Methodology

On April 7<sup>th</sup>, 2014, the Certificate IV Conservation and Land Management students of the Great Southern Institute of Technology, Albany, drove 90 kilometres east of Albany and reached Mireembin Lake. The students used Canadian canoes to travel over Swan Lake and explore the boundaries of the waterbody. Each boat carried a Geographical Positioning Device (GPS), a measuring stick to measure accurate depth readings up to 2.4 metres and then a weighted string for any deeper readings required.

An opportunistic survey of the flora around the lake was undertaken by the TAFE students. Plant species were photographed in the field and named back in the class room, a list of 30 species was recorded.

A water sample was collected from Swan Lake and water quality measurements were undertaken back at the laboratory at the GSIT College. The equipment was calibrated and probes provided EC & pH readings.

Important reference material was sourced from the Department of Water and enquiries were made to try and locate any other previous water quality data collected for Mireembin Lake (University of Western Australia etc).



Figure 13: The boat launching area on south eastern side of lake

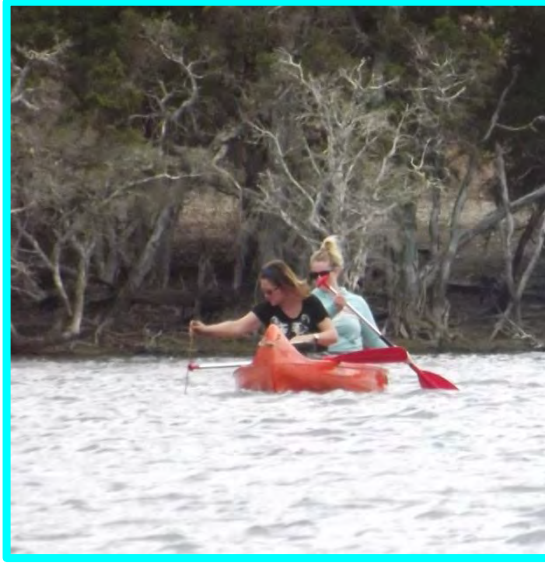


Figure 14: GSIT students carrying out depth & GPS measurements from the canoes



Figure 16: Exposed roots on northern shore



Figure 15: Sedge lined shores of the Lake

## 3.0 Results

### 3.1 Water Quality Measurements

Date of readings: 7/04/2014

PH of water sample was: 8.37 (the equipment was calibrated prior to use and during use)

Conductivity (total dissolved salts) 8ppt (parts per thousand)

Water surface did have algae on it

Fish up to 10cm in length were observed in the water



3.2 Water Depths

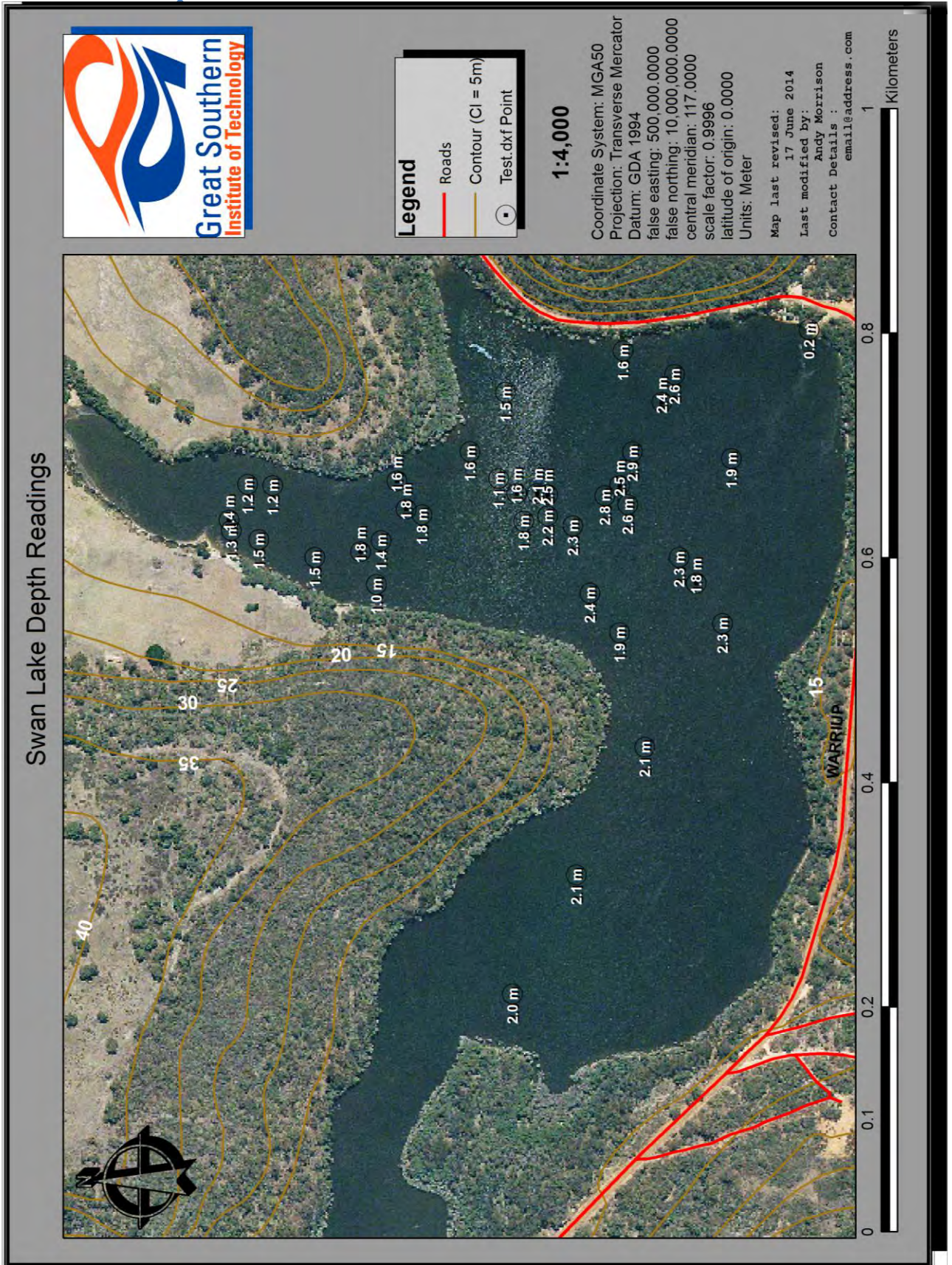


Figure 17: Mirembin Lake depth readings





Figure 18: Young *Melaleuca cuticularis* bordering Mireembin Lake showing past flood levels

### 3.3 Flora

#### 3.31 Vegetation Communities

Mireembin Lake has a mix of structured plant species groupings representative of six major vegetative communities described in the *Albany Regional Vegetation Survey* by Sandiford & Barrett (2010);

- *Eucalyptus cornuta* / *Eucalyptus occidentalis* open woodland,
- *Corymbia calophylla* marri open forest,
- *Banksia littoralis* low open woodland,
- Wet shrub land over sedgeland
- *Melaleuca cuticularis* low open woodland, and
- Riparian vegetation

The Lake has banks of many different directional aspects and each is unique in species composition reflective of the complex geology and soils surrounding the site. The main eucalypts surrounding the lake are; *Eucalyptus cornuta*, *Eucalyptus occidentalis* and *Corymbia*



*calophylla*. Further up slope on the Plantagenet Siltstone area *Eucalyptus* species including; *Eucalyptus goniantha*, *Eucalyptus tetragona* & *Eucalyptus falcata*.

In the western arm of Mireembin Lake where Mullocullop Creek enters the waterway there is evidence of large stands of dead *Melaleuca cuticularis*. It is assumed that these tree deaths are caused by 'flooding events' when wetter seasons have caused the 'closed' water body to increase in water level over quite long periods of time and cause the drowning of these plants.



Figure 20: A reed meadow in front of Melaleuca and Eucalypt woodland



Figure 21: Saltwater Paperbarks (*Melaleuca cuticularis*) closed woodland on a north eastern bank.



Figure 22: Marri (*Corymbia calophylla*) woodland at an outcropping Plantagenet Siltstone site



Figure 23: Swamp Banksia (*Banksia littoralis*) on the western banks of Swan Lake

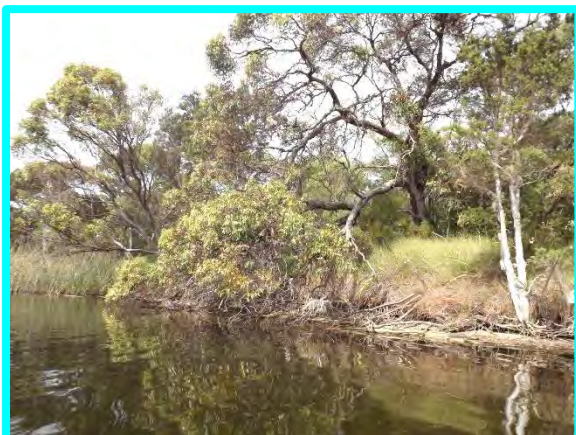


Figure 19: River yate (*Eucalyptus cornuta*) on the western side of the Lake



Figure 24: The paperbark open woodland just upslope on the eastern side of the Lake



3.32 Flora species sighted on field trip

Figure 25: Flora species opportunistically surveyed, photographed and identified around Mireembin Lake



Saltwater paperbark - *Melaleuca cuticularis*



*Leucopogon obovatus*



Common clematis creeper - *Clematis pubescens*



*Acacia urophylla*



The buds of a yate tree - *Eucalyptus cornuta*



The nut off a marri tree – *Corymbia calophylla*





The buds and flowers of a river yate tree - *Eucalyptus cornuta*



The buds and nuts off a river yate tree - *Eucalyptus cornuta*



A flat topped yate on the eastern shore - *Eucalyptus occidentalis*



The buds of a river yate tree - *Eucalyptus cornuta*



The buds of a flat topped yate tree - *Eucalyptus occidentalis*



The flower stem of the balga *Xanthorrhoea platyphylla*



The buds of a salt water paperbark- *Melaleuca cuticularis*



The coastal woolly bush on the western side of the lake – *Adenanthos sericeus*



The swamp willow on the western side of the Lake *Callistachus lanceolata*





The drooping leaves of a *Trymalium sp.*

The prickly stem of *Acacia pulchella*

The red stems of – *Acacia subcaerulea*



The distinctive prickly leaf of - *Banksia sessilis*

The unique looking leaves of one of the snottygobblers - *Persoonia elliptica*

Common clematis creeper - *Clematis pubescens*

### 3.4 Fauna

Mireembin Lake has a diversity of fauna species which use the waterbody and its surrounds as habitat to feed, shelter and breed. There was no opportunity to carry out an indepth fauna survey specific to the site but over two hundred birds were observed on the Lake during the GSIT field trip. Birds Australia kindly provided a Bird List compiled for Mullucollup Nature reserve (see in Appendix 2). A Fauna Survey was also carried out over a two year time period on Benmore Farm about 10 km west of Mireembin Lake (results presented in Appendix 3). Long necked Turtle are also known to reside in the lake (pers.com. J. Geffries, 2014).

Figure 26: Fauna evidence at Mireembin Lake



Western grey kangaroo tracks on the edge of the Lake

Suspected echidna diggings in the side of the termite mounds



Mireembin Lake is home to a diverse range of waterbirds

The Australian white ibis roosting in a tree

#### 4.0 Discussion

The results from this survey reveal that Mireembin Lake is a permanent water body with depths exceeding three meters even at the end of a dry summer. The evidence of water staining on the lower trunks of the *Melaleuca cuticularis* stands on the fringe of The Lake are caused by seasonal flooding events and provide the evidence of higher lake water levels in the recent past. The large stands of dead *Melaleuca cuticularis* at the western end of the lake are evidence where the trees were exposed to a long period of higher water levels causing them to drown.



The water quality measurements of Mireembin Lake revealed it to be fairly alkaline with a pH of 8.37. This is probably reflective of the Plantagenet Siltstone base rock of the Mireembin Lake catchment. Due to the closed nature of this lake there is no winter flushing of water and sediments accumulate over many thousands of years. The conductivity (total dissolved salts) to measure salinity levels were 8 parts per thousand which places Mireembin Lake in the 'brackish' category.

The complex flora communities and species surrounding Mireembin Lake are reflective of the unusual geology influencing the landform of the catchment. There is a mix of plant species from the two IBRA regions with at least six Eucalypt species in the near vicinity of The Lake. There are Proteaceous species like; *Banksia littoralis* and *Adenanthos sericeus*, located near the access road way which are prone to Dieback (*Phytophthora cinnammomi*) Disease.

The collated fauna species lists indicate that there is a wide range of animal species from all major groups that inhabit this area. There are historical records of Declared Rare Fauna mammal species like quokka, western ring tailed possums and chuditch residing recently in the Green Range District. There are specially protected migratory birds that have also been recorded in this locality and Mireembin Lake may provide these bird species with occasional refuge. There is large community of wetland birds that feed, roost and nest on Mireembin Lake and these can be seen in all parts of The Lake.

There is rich cultural history surrounding Mireembin Lake. It is place rich in food sources and shelter. There is physical evidence of artifacts in the granite rock outcropping areas within a few hundred meters of Mireembin Lake. Local Menang Elders have spoken of strong heritage and family connection to the lake and the surrounding district. The north eastern arm of the Mireembin Lake water body also sits on one of the oldest land titles released in early European settlement of the District. The old Hassell Homestead sits within a few hundred meters of Mireembin Lake and overlooks this spectacular waterbody.

Due to the increasing population along the southcoast of Western Australia there is increasing recreational pressure on Mireembin Lake. It is recommended that Management Guidelines for Mireembin Lake are created within the near future to protect all the special components of this special wetland.

## 5.0 Conclusions

The snapshot data in this report of some of Mireembin Lake's ecological features has been compiled in the hope that future management decisions for this reserve can be drawn from a wider base of information. We also hope this report forms a base structure to encourage future researchers to collect more data in the vicinity of Mireembin Lake to increase our knowledge on landscape functioning of this unique area. There is definitely scope to return to Mireembin Lake to build on water quality data including macroinvertebrates and other aquatic fauna.

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## Appendix

1. Priority Flora Descriptions For Area near Swan Lake
2. Birds Australia Sighting List for Mullocullup Nature reserve
3. Fauna Survey List for Benmore Farm

## Appendix 1 - Rare or Unusual Flora in the Area – all photos and information extracted from the Florabase WA website

### Rare or locally unusual flora within a 10 kilometres radius of the property

Site No.	Rare or unusual flora present (or possible)
All sites	Plant species which are on the Declared rare list within a 10 kilometres buffer of the property include: <a href="#">Banksia brownii</a> Feather-leaved Banksia T, <a href="#">Calothamnus robustus</a> P3, <a href="#">Chordifex abortivus</a> T, <a href="#">Eucalyptus acies</a> Woolburnup Mallee P4, <a href="#">Eucalyptus goniantha subsp. goniantha</a> Jerdacuttup Mallee P4, <a href="#">Grevillea tetragonoloba</a> P2, <a href="#">Hakea lasiocarpa</a> P3, <a href="#">Jacksonia calycina</a> P4, , <a href="#">Leucopogon elegans ssp psorophyllus</a> P3, <a href="#">Melaleuca micromera</a> P3, <a href="#">Prostanthera verticillaris</a> P1, <a href="#">Stenanthemum sublineare</a> P2, <a href="#">Stylidium daphne</a> P2

**Declared Rare Flora - Presumed Extinct:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee

**Declared Rare Flora - Extant:** (T) which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee. (= *Threatened Flora = Endangered + Vulnerable*)

**Priority One - Poorly Known:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey

**Priority Two - Poorly Known:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey

**Priority Three - Poorly Known:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey

**Priority Four - Rare:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years

***Banksia brownii*** Feather-leaved Banksia Conservation Code: **Threatened Flora (Declared Rare Flora — Extant)**, Naturalised Status: **Native to Western Australia**  
 Bushy, non-lignotuberous shrub or tree (small), 1-6 m high. Fl. cream & brown/orange-red, Mar to Jul. Sand over laterite, gravel, loam over granite. In gullies.

**Local Government Areas (LGAs):** Albany, Cranbrook, Gnowangerup, Plantagenet.



*Banksia brownii*

Photos: S.D. Hopper, P.G. Armstrong & T.J. Alford

***Calothamnus robustus*** - Conservation Code: **Priority Three**

Naturalised Status: **Native to Western Australia**

**Erect, compact shrub, 0.5-1.5 m high. Fl. red, Feb or Jul or Sep to Nov. Rocky quartzite or granitic soils. Low hills.**

**Distribution** Local Government Areas (LGAs): **Albany.**



*Calothamnus robustus*

Photos: J.A. Cochrane



***Chordifex abortivus*** - Conservation Code: [Threatened Flora \(Declared Rare Flora — Extant\)](#) Naturalised Status: Native to Western Australia Rhizomatous, erect perennial, herb, to 0.5 m high. Fl. brown, Sep to Oct. Sand. Low rises & undulating areas. **Local Government Areas (LGAs):** Albany.



***Eucalyptus acies*** - Woolburnup Mallee Conservation Code: [Priority Four](#) Naturalised Status: Native to Western Australia Name Status: [Current](#) Local Government Areas (LGAs): Albany, Gnowangerup, Ravensthorpe.



***Eucalyptus goniantha* subsp. *goniantha*** - Jerdacuttup MalleeConservation Code: [Priority Four](#)Naturalised Status: [Native to Western Australia](#)**Mallee or tree (rarely), 1.5-10 m high, bark smooth, shedding. Fl. cream-white, Sep or Nov to Dec or Jan to Feb. Sand, sandy clay, often over weathered granite & laterite. Coastal areas.****Distribution****Local Government Areas (LGAs):** Albany, Cranbrook, Esperance, Jerramungup, Plantagenet.***Grevillea tetragonoloba*** Conservation Code: [Priority Two](#)**Naturalised Status:** Native to Western Australia**Local Government Areas (LGAs):** Albany, Gnowangerup, Jerramungup, Lake Grace, Plantagenet, Ravensthorpe.**Habit and leaf form.** Shrubs, 0.5–2.5 m high. Branchlets not glaucous. *Leaves* simple, 60–130 mm long overall. Leaf blade dissected, subpinnatisect, not further divided. Leaf lobes 30–75 mm long, 1–1.5 mm wide. Margins revolute, enclosing the lower surface of the leaf blade, forming two grooves with the midvein. Hairs straight.**Inflorescence and floral features.** Inflorescence terminal; a raceme. *Flowers* brown, very irregular. Pedicel 1–2 mm long. Perianth 8–10 mm long, simple-hairy, 4 -partite. Stamens 4. Pistil 20–25 mm long, sessile. Ovary hairy. Styles glabrous, orange or red. *Pollen presenter* oblique. **Flowering Time.** Flowers throughout the year. **Habitat.** Amongst medium trees, or low trees; in rocky or stony soil, or gravelly soil, or loam, or clay; occupying heathlands.**Distribution.** Western Australia. Western Australian Botanical Province(s): South-west; IBRA Bioregions SW: MAL and ESP. Western Australian native; endemic to Western Australia.**Etymology.** *tetragonoloba* (Gk): *tetra* four, *gonia* an angle + (L): *lobus* a lobe (refers to the cross-



sectional shape of the leaf lobes. **Fruit features.** Fruit ovoid, simple hairy, brown, 10–15 mm long.



***Hakea lasiocarpa*** - Conservation Code: [Priority Three](#)

Naturalised Status: **Native to Western Australia** Erect shrub, to 6 m high. **Fl. white, May to Jul.** **Sandy loam soils, organic litter over sand, clay or gravel. Hill tops, valleys.** Local Government Areas (LGAs): **Albany, Jerramungup, Plantagenet.** Common Name(s). **Long styled Hakea.** Habit and leaf form. **Shrubs, 1–6 m high. Leaves alternate, leaves 30–45 mm long overall. Leaf blade 30–45 mm long, 1–2 mm wide, dissected; indumentum absent.** Inflorescence and floral features. **Inflorescence axillary, racemose. Flowers pedicellate, white. Pedicel 3–5 mm long. Perianth (perigone) 8–9 mm long. Pistil 20–24 mm long. Pollen presenter conical.** Fruit and seed features. **Fruit 20–23 mm long, 10 mm wide; corky tetrahedral projections absent; red-brown and pale wood zones absent. Seed 10–11 mm long; wing discontinuous, marginal, extending down one lateral side only.** Distribution. **Western Australia. IBRA Bioregions SW: AW, or JF, or WAR, or ESP.** Habitat. **Amongst low (sclerophyll) shrubland; in sand, or clay.** Flowering Time. **May to July.** Etymology. **Lasiocarpa (Gk): lasio – woolly; carpha – dried up, withered, straw- or chaff-like; referring to the dry, woolly branchlets of this species.** Conservation Status. **P1: Priority One - Poorly Known Taxa.**



***Jacksonia calycina*** - Conservation Code: [Priority Four](#) Naturalised Status: **Native to Western Australia** Erect or straggling shrub, (0.2-)0.4-1.4 m high. Fl. orange/yellow & red, Sep to Nov. Gravelly sandy or clayey soils. Sandplains, low rises, hillslopes.

Local Government Areas (LGAs): Albany, Cranbrook, Gnowangerup, Plantagenet.



### ***Leucopogon elegans* subsp. *psorophyllus***

Conservation Code: [Priority Three](#)

Naturalised Status: Native to Western Australia Name Status: [Current](#)

Local Government Areas (LGAs): Albany, Jerramungup.

**Unfortunately No Photo Available** - was found in deep sand in Banksia shrubland



**Melaleuca micromera** - Conservation Code: [Priority Three](#)

Naturalised Status: **Native to Western Australia** Shrub, 1-4 m high. Fl. yellow, Sep to Oct. Gravelly sandy loam or clay. Local Government Areas (LGAs): Albany, Boyup Brook, Broomehill-Tambellup, Cranbrook, Gnowangerup, Plantagenet.



**Prostanthera verticillaris** - Conservation Code: [Priority One](#)

Naturalised Status: **Native to Western Australia**  
Openly branched, spreading shrub, 0.5-2 m high, 0.6-3 m wide. Fl. blue-purple/white, Sep to Oct. Granitic loam. Granite outcrops.  
Local Government Areas (LGAs): Albany.



***Stenanthemum sublineare*** Conservation Code: [Priority Two](#)

Naturalised Status: Native to Western Australia

Local Government Areas (LGAs): Albany, Gosnells, Swan, Wanneroo.

**Unfortunately No Photo Available**

***Stylidium daphne*** - Conservation Code: [Priority Two](#)

Naturalised Status: Native to Western Australia

Rosetted perennial, herb, 0.15-0.45 m high, Leaves tufted, linear to narrowly oblanceolate, 1-4.5 cm long, 0.5-2 (-3) mm wide, apex subacute, margin entire, hoary. Scape mostly glabrous, inflorescence axis sparingly glandular. Inflorescence racemose. Fl. yellow, Dec. Grey to white sand or brown sandy clay loam over laterite. Gentle slopes or winter wet depressions. Mallee or Melaleuca shrubland. **Local Government Areas (LGAs):** Albany.

**Unfortunately No Photo Available**

## Appendix 2 – Bird Species Sighting List Compiled in 2008 by Birds Australia

### Species list for Mullocullop Nature Reserve (based on taxonomy Christides & Boles 2008)

#### ANSERIFORMES

##### Anatidae

*Biziura lobata* Musk Duck  
*Cygnus atratus* Black Swan  
*Tadorna tadornoides* Australian Shelduck  
*Chenonetta jubata* Australian Wood Duck  
*Anas rhynchotis* Australasian Shoveler  
*Anas gracilis* Grey Teal  
*Anas superciliosa* Pacific Black Duck  
*Aythya australis* Hardhead  
*Oxyura australis* Blue-billed Duck

#### PODICIPEDIFORMES

##### Podicipedidae

*Tachybaptus novaehollandiae* Australasian Grebe  
*Poliiocephalus poliocephalus* Hoary-headed Grebe

#### COLUMBIFORMES

##### Columbidae

*Phaps chalcoptera* Common Bronzewing  
*Phaps elegans* Brush Bronzewing  
*Ocyphaps lophotes* Crested Pigeon

#### PHALACROCORACIFORMES

##### Phalacrocoracidae

*Microcarbo melanoleucos* Little Pied Cormorant  
*Phalacrocorax sulcirostris* Little Black Cormorant

#### CICONIIFORMES

##### Ardeidae

*Egretta novaehollandiae* White-faced Heron

##### Threskiornithidae

*Threskiornis molucca* Australian White Ibis  
*Platalea flavipes* Yellow-billed Spoonbill

#### ACCIPITRIFORMES

##### Accipitridae

*Elanus axillaris* Black-shouldered Kite  
*Lophoictinia isura* Square-tailed Kite  
*Haliastur sphenurus* Whistling Kite  
*Accipiter cirrhocephalus* Collared Sparrowhawk  
*Circus approximans* Swamp Harrier  
*Aquila audax* Wedge-tailed Eagle  
*Hieraaetus morphnoides* Little Eagle

#### FALCONIFORMES

##### Falconidae

*Falco longipennis* Australian Hobby

#### GRUIFORMES

##### Rallidae

*Porphyrio porphyrio* Purple Swamphen  
*Porzana tabuensis* Spotless Crake  
*Fulica atra* Eurasian Coot

#### CHARADRIIFORMES

##### Charadriidae

*Charadrius ruficapillus* Red-capped Plover  
*Elseyaornis melanops* Black-fronted Dotterel  
*Thinornis rubricollis* Hooded Plover  
*Vanellus tricolor* Banded Lapwing  
*Calidris acuminata* Sharp-tailed Sandpiper

#### PSITTACIFORMES

##### Cacatuidae

*Calyptorhynchus latirostris* Carnaby's Black-Cockatoo  
*Eolophus roseicapillus* Galah

##### Psittacidae

*Glossopsitta porphyrocephala* Purple-crowned Lorikeet  
*Polytelis anthopeplus* Regent Parrot  
*Platycercus icterotis* Western Rosella

*Barnardius zonarius* Australian Ringneck  
*Purpureicephalus spurius* Red-capped Parrot  
*Neophema elegans* Elegant Parrot

**CUCULIFORMES**

**Cuculidae**

*Chalcites lucidus* Shining Bronze-Cuckoo  
*Cacomantis flabelliformis* Fan-tailed Cuckoo

**STRIGIFORMES**

**Strigidae**

*Ninox novaeseelandiae* Southern Boobook

**CORACIIFORMES**

**Halcyonidae**

*Todiramphus sanctus* Sacred Kingfisher

**PASSERIFORMES**

**Maluridae**

*Malurus splendens* Splendid Fairy-wren  
*Malurus elegans* Red-winged Fairy-wren

**Acanthizidae**

*Sericornis frontalis* White-browed Scrubwren  
*Gerygone fusca* Western Gerygone  
*Acanthiza apicalis* Inland Thornbill  
*Acanthiza chrysorrhoa* Yellow-rumped Thornbill

**Pardalotidae**

*Pardalotus punctatus* Spotted Pardalote

**Meliphagidae**

*Acanthorhynchus superciliosus* Western Spinebill  
*Anthochaera lunulata* Western Wattlebird  
*Anthochaera carnunculata* Red Wattlebird  
*Lichmera indistincta* Brown Honeyeater  
*Phylidonyris novaehollandiae* New Holland Honeyeater  
*Melithreptus lunatus* White-naped Honeyeater

**Neosittidae**

*Daphoenositta chrysoptera* Varied Sittella

**Campephagidae**

*Coracina novaehollandiae* Black-faced Cuckoo-shrike

**Pachycephalidae**

*Pachycephala pectoralis* Golden Whistler  
*Colluricincla harmonica* Grey Shrike-thrush

**Artamidae**

*Artamus cyanopterus* Dusky Woodswallow  
*Cracticus torquatus* Grey Butcherbird  
*Cracticus tibicen* Australian Magpie  
*Strepera versicolor* Grey Currawong

**Ripiduridae**

*Rhipidura albiscapa* Grey Fantail  
*Rhipidura leucophrys* Willie Wagtail

**Corvidae**

*Corvus coronoides* Australian Raven

**Monarchidae**

*Myiagra inquieta* Restless Flycatcher

**Petroicidae**

*Petroica boodang* Scarlet Robin  
*Eopsaltria georgiana* White-breasted Robin

**Timaliidae**

*Zosterops lateralis* Silveryeye

**Hirundinidae**

*Hirundo neoxena* Welcome Swallow  
*Petrochelidon nigricans* Tree Martin

**Estrildidae**

*Stagonopleura oculata* Red-eared Firetail

## Appendix 3 – Bird Species Sighting List Compiled in 2008 by Birds Australia

### ITC Fauna Survey 2009 Report

Prepared by Green Skills Inc.

Species Identified	Sunnyside	Benmore	Cheynes
<i>Birds</i>			
Emu	*	*	*
Brown Quail	*		*
Stubble Quail		*	
Musk Duck		*	
Australian Wood Duck		*	
Grey Teal		*	
Australian Shelduck		*	
Pacific Black Duck		*	*
Little Pied Cormorant		*	
Banded Lapwing	*		*
White-faced Heron		*	
White-necked Heron			*
Wedge-tailed Eagle	*	*	*
Square-tailed Kite		*	
Black-shouldered Kite	*	*	
Swamp Harrier		*	*
Nankeen Kestrel		*	
Collared Sparrowhawk		*	
Brown Goshawk		*	
Australian Hobby		*	
Brown Falcon	*	*	*
Eurasian Coot		*	
Purple Swamphen			*
Spotless Crake		*	
Crested Pigeon		*	
Common Bronzewing	*	*	*
Brush Bronzewing	*	*	*
Carnaby's Black Cockatoo		*	
Baudin's Black Cockatoo		*	*
Red-tailed Black Cockatoo	*		
Galah		*	
Purple-crowned Lorikeet	*	*	*
Regent Parrot	*	*	*
Western Rosella		*	
Red-capped Parrot	*	*	*
Australian Ringneck	*	*	*
Elegant Parrot		*	*
Fantail Cuckoo		*	
Horsefield's Bronze-Cuckoo	*	*	*
Shining Bronze-Cuckoo	*	*	*



# REPORT ITEM DIS035 REFERS

Black-eared Cuckoo			*
Fork-tailed Swift	*	*	
Laughing Kookaburra	*	*	*
Red-winged Fairy-Wren	*	*	
Splendid Fairy-Wren		*	
Southern Emu-Wren	*	*	
Striated Pardalote		*	
White-browed Scrubwren	*	*	*
Western Gerygone		*	
Yellow-rumped Thornbill		*	*
Western Thornbill	*		
Inland Thornbill		*	*
Red Wattlebird	*	*	*
Little Wattlebird	*	*	*
Yellow-throated Miner		*	
Yellow-plumed Honeyeater		*	
Singing Honeyeater	*		
Brown Honeyeater	*	*	
Tawny-crowned Honeyeater	*	*	
New Holland Honeyeater	*	*	*
White-naped Honeyeater		*	
Western Spinebill	*	*	*
White-breasted Robin		*	*
Western Whipbird	*	*	
Black-capped Sittella		*	*
Golden Whistler		*	*
Rufous Whistler		*	
Grey Shrike-Thrush	*	*	*
Restless Flycatcher	*		
Grey Fantail	*	*	*
Willie Wagtail	*	*	*
Magpie-lark	*	*	
Black-faced Cuckoo-Shrike	*	*	*
White-winged Triller	*		
Dusky Woodswallow		*	
Grey Butcherbird	*	*	*
Australian Magpie	*	*	*
Grey Currawong	*		*
Australian Raven	*	*	*
Australian Pipit	*	*	
Red-eared Firetail	*	*	*
Welcome Swallow		*	
Tree Martin	*	*	
Silvereye	*	*	*



<i>Mammals</i>			
Short-beaked Echidna			*
Grey-bellied Dunnart	*		
Mardo			*
Southern Brown Bandicoot		*	
Honey Possum	*	*	*
Pygmy possum			*
Western Grey Kangaroo	*	*	*
House Mouse	*	*	*
Black Rat		*	
Bush Rat	*	*	*
Fox	*	*	*
Cat	*		
Rabbit	*	*	*
<i>Reptiles</i>			
<i>Geckos</i>			
Strophurus spinigerus (Spiny-tailed Gecko)		*	
<i>Worm lizards</i>			
Delma australis (Marbled-faced Delma)			*
<i>Skinks</i>			
Ctenotus catenifera (Chain-striped Heath Ctenotus)	*	*	
Ctenotus labillardieri (Red-legged Ctenotus)		*	
Egernia napoleonis (Southwestern Crevice Skink)		*	
Hemiergis initialis (Southern Five-toed Mulch Skink)		*	
Hemiergis peronii (Four-toed Mulch Skink)	*	*	
Menetia greyii (Common Dwarf Skink)	*	*	
Lerista distinguenda (Southwestern Four-toed Lerista)		*	
Lerista microtis (Variable-striped Robust Lerista)		*	
Morethia obscura (Shrubland Pale-flecked Morethia)	*	*	
Morethia lineocellata (West Coast Pale-flecked Morethia)		*	
Tiliqua rugosa (Bobtail)	*	*	*
<i>Monitors</i>			
Varanus rosenbergi (Southern Heath Monitor)	*		
<i>Legless Lizards</i>			
Delma australis (Marble-faced Delma)	*	*	
Pygopus lepidopodus (Southern Scalyfoot)	*		
<i>Snakes</i>			
Notechis scucatus (Tiger Snake)	*		*
Pseudonaja affinis (Dugite)		*	*
Elapognathus coronatus (Crowned Snake)	*	*	*
Echiopsis curta (Bardick)	*	*	
Rhamphatyphlops australis (Southwestern Blind Snake)		*	

<i>Amphibians</i>			
<i>Frogs</i>			
<i>Crinia pseudinsignifera</i> (Bleating Froglet)	*	*	
<i>Crinia georgiana</i> (Quacking Frog)	*	*	*
<i>Crinia glauerti</i> (Clicking Froglet)		*	*
<i>Litoria adelaidensis</i> (Slender tree Frog)	*	*	*
<i>Litoria cyclorhyncha</i> (Spotted-thighed Frog)	*	*	*
<i>Litoria moorei</i> (Motorbike Frog)	*	*	*
<i>Geocrinia leai</i> (Lea's Frog)		*	
<i>Lymnodastes dorsalis</i> (Banjo Frog)	*	*	*
<i>Psuedophryne guentheri</i> (Guenther's Toadlet)	*	*	*
<i>Helioporus eyrei</i> (Moaning Frog)		*	
<i>Helioporus psammophilus</i> (Sand Frog)	*	*	



A view across Mireembin Lake to the historical farm site

Photo courtesy of [www.panaromio.com](http://www.panaromio.com)

Coroners Act 1996  
[Section 26(1)]



*Western*

*Australia*

## **RECORD OF INVESTIGATION INTO DEATH**

Ref: 40/16

I, Sarah Helen Linton, Coroner, having investigated the death of **Wendy Elizabeth BEARFOOT** with an inquest held at the **Albany Courthouse** on **31 October 2016 to 4 November 2016** and **Perth Coroner's Court, Court 51, CLC Building, 501 Hay Street, Perth** on **7 November 2016** find that the identity of the deceased person was **Wendy Elizabeth BEARFOOT** and that death occurred on **1 November 2012** at **Royal Perth Hospital** as a result of **multiple organ failure following thermal injury** in the following circumstances:

### **Counsel Appearing:**

Sgt L Housiaux assisting the Coroner.

Mr D Anderson (assisted by Danielle Underwood, State Solicitor's Office) appearing on behalf of DPaW (formerly DEC) and DFES (formerly FESA) and Gary Logan, Vince Hilder, Michael Shephard, Greg Freebury, Matthew Corlett, Jason Fletcher Shaun McHenry, Charlene Dekker, Timothy Wellstead, Peter Dans, Lloyd Bailey and Dr Neil Burrows.

Mr M Trowell QC (instructed by DLA Piper) appearing on behalf of the City of Albany.

Mr A Lu (Jarman McKenna) appearing on behalf of Brian Pickford, Kenneth Johnson, Brent Findlay, Andrew Sharpe, Garry Turner and David Wettenhall.

Mr T Nolan (Turner Freeman Lawyers) appearing on behalf of Russell Gould.

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## INTRODUCTION

1. On the morning of 12 October 2012 a bush fire, later known as the Black Cat Creek Fire, was reported in Kalgan in the Great Southern region of Western Australia. The official bushfire season, when the highest fire danger period exists, had not yet started but the environmental conditions were still such that the fire developed rapidly, ultimately consuming approximately 1300 hectares of land.<sup>1</sup>
2. Management of the fire was facilitated by the City of Albany and the Volunteer Bush Fire Brigade, with support and assistance provided by the Department of Environment and Conservation (DEC)<sup>2</sup> and the Fire and Emergency Services Authority (FESA)<sup>3</sup>. Fire personnel from the various agencies went to the Kalgan area to assist in controlling and containing the fire.
3. That afternoon a number of DEC staff performing fire suppression tasks in the area became trapped in a burnover in their vehicles. Wendy Bearfoot was one of those people. She was severely burnt in the incident. Despite medical treatment at Albany Regional Hospital and the Royal Perth Hospital State Burns Unit, Mrs Bearfoot died from complications of her injuries on 1 November 2012. A number of Mrs Bearfoot's colleagues were also seriously burnt and were fortunate to survive.
4. After the event a comprehensive investigation was undertaken into the death by officers from the WA Police Arson Squad on behalf of the State Coroner. In addition, a Major Incident Review was commissioned by DEC, FESA and the City of Albany independently of the police investigation, with that report also provided to the State Coroner. On 1 July 2013, based upon the information contained in these materials, the State Coroner approved the matter to be listed for an inquest hearing.
5. I held an inquest from 31 October to 4 November 2016 in Albany and on 7 November 2016 in Perth.
6. A large amount of documentary evidence was tendered during the inquest.<sup>4</sup> Many of the people involved in the fire were also called to give oral evidence, as well as some of the investigators and senior members of the various agencies involved in the fire suppression operation.

<sup>1</sup> Exhibit 1, Tab 2, p. 61.

<sup>2</sup> As it then was – it is now known as the Department of Parks and Wildlife (Parks and Wildlife). I will use DEC or Parks and Wildlife interchangeably but will generally refer to DEC in relation to events at the time of the fire.

<sup>3</sup> As it then was – it is now known as the Department of Fire and Emergency Services (DFES). I will use DFES and FESA interchangeably, but will generally refer to FESA in relation to events at the time of the fire.

<sup>4</sup> Exhibits 1 – 13.

7. At the start of the inquest counsel assisting identified a number of issues or questions that it was anticipated the inquest would address.<sup>5</sup> At the conclusion of the inquest hearing I considered each of these questions and gave some indication to counsel as to my preliminary views. I then heard oral submissions from counsel on behalf of their clients,<sup>6</sup> which I also took into account in reaching my conclusions and preparing this finding.

## **BACKGROUND**

8. Wendy Bearfoot was born in Portsmouth, England on 12 January 1967. She moved to Western Australia as a young child and lived in Albany for the rest of her life. She married Garry Bearfoot on 28 May 1988<sup>7</sup> and they had three sons together.<sup>8</sup>At the time leading up to her death she lived at home in Albany with her husband.
9. Mrs Bearfoot was a fit and healthy person who was rarely unwell. She had no chronic medical conditions and took no regular medications.<sup>9</sup>
10. Mrs Bearfoot first began working with DEC as a land management trainee and completed her Certificate IV in CALM on 30 June 2006. Her training was based in the Albany District National Parks and Reserves. She continued to work for the DEC following the completion of her training, first as a weed controller and later as a park controller and leading hand at the DEC yard.<sup>10</sup> She was appointed as a permanent Conservation Employee Overseer on 5 July 2011.<sup>11</sup>

## **THE START OF BLACK CAT CREEK FIRE**

11. In October 2012 Michelle Halling lived with her family at Black Cat Creek Farm on Two Peoples Bay Road in Kalgan. The farm is named after Black Cat Creek that runs through the back of the property from Moates Lake out to the sea. The area falls within the local government area of Albany.<sup>12</sup>
12. Mrs Halling and her husband lived on a small part of the farm, in a homestead with associated structures. A large portion of the rest of the land was leased out to the Forest Products Commission (FPC), which had a pine plantation on the site.<sup>13</sup> Separate to the pine plantation, the

<sup>5</sup> T 12 – 13.

<sup>6</sup> T 674 – 713.

<sup>7</sup> Exhibit 1, Tab 4.

<sup>8</sup> Exhibit 1, Tab 15.

<sup>9</sup> Exhibit 1, Tab 9.

<sup>10</sup> Exhibit 1, Tab 14 and Tab 15.

<sup>11</sup> Exhibit 1, Tab 14.

<sup>12</sup> Exhibit 1, Tab 16.

<sup>13</sup> Exhibit 1, Tab 1, p. 7 and Tab 16.



natural vegetation on the property was a mixture of native woodland, coastal heath and shrublands comprising an overstorey of jarrah, marri and sheoak.<sup>14</sup> Much of the native vegetation growth had not been burnt for many years, with local estimates that it had been unburnt for approximately 50 years prior to this fire.<sup>15</sup>

13. On Friday, 12 October 2012 Mrs Halling was at home with her foster daughter. Sometime between 8.30 am and 9.30 am Mrs Halling's foster daughter went outside briefly and then returned inside and urgently told Mrs Halling to come outside. When Mrs Halling walked outside she saw flames about 20 to 25 metres away from the homestead, in the vicinity of the farm tip. She could see a number of small fires, some of which were well alight high up in the trees. Mrs Halling went inside to get the cordless telephone, which she handed to her foster daughter and told her to call her husband who had gone out. Mr Halling was asked to call the fire brigade and return home. Mrs Halling then called emergency services and reported the fire as well. During this time Mrs Halling was also attempting to untangle a hose and make it long enough to reach the fire, but she was finding it difficult to do.<sup>16</sup>
14. Mrs Halling's call to FESA was recorded at 9.32 am. Mr Halling's call to FESA was recorded at 9.34 am, confirming his wife's earlier request for assistance.<sup>17</sup>
15. Mr Halling returned home immediately. When he arrived he saw a grass fire heading towards the homestead. Mr Halling ran to the shed and came back out with a hessian sack, which he got Mrs Halling to wet while he rang '000' again to ask for help. Once the sack was wet Mr Halling used it to try to put out some of the fire. He described seeing "a big fire ball,"<sup>18</sup> which he couldn't reach due to the intense heat, so he stood about 10 metres from the fire ball and tried to extinguish the grass fire.<sup>19</sup>
16. Approximately 10 minutes after Mr Halling arrived home the first of the fire fighters arrived. Mr and Mrs Halling were advised to leave the farm for their own safety. They left the farm with their foster daughter and some personal items. As they were leaving they were reassured by some of the fire fighters that the fire was likely to be easily confined into a controlled burn.<sup>20</sup> After the events Mr Halling and Mrs Halling were asked if they could think of any explanation for how the fire started, but they could not.<sup>21</sup>

<sup>14</sup> Exhibit 1, Tab 1, p. 8.

<sup>15</sup> Exhibit 1, Tab 1, p. 8.

<sup>16</sup> Exhibit 1, Tab 16 and Tab 17.

<sup>17</sup> Exhibit 1, Tab 2, p. 9.

<sup>18</sup> Exhibit 1, Tab 17 [51].

<sup>19</sup> Exhibit 1, Tab 16 and Tab 17.

<sup>20</sup> Exhibit 1, Tab 16 and Tab 17 [66].

<sup>21</sup> Exhibit 1, Tab 16 and Tab 17.

## **THE AGENCIES & THEIR ROLES IN FIRE FIGHTING IN THE CITY OF ALBANY**

17. The City of Albany covers a substantial land area of 4234 km<sup>2</sup>. Like much of rural Western Australia, the area is subject to many spot fires during bushfire season. The City of Albany manages 16 volunteer bushfire brigades, staffed by over 700 volunteer firefighters. The brigades are located across the municipality, with the aim that they are in close proximity to any bushfire risk and can respond quickly. There are approximately 30 fire appliances in the fleet, being a mix of heavy duty trucks and light or 'fast attack' vehicles (predominantly Toyota Landcruiser-type vehicles), spread across the brigades.<sup>22</sup>
18. Mr Andrew Sharpe, the current Chief Executive Officer of the City of Albany, gave evidence that in the 12 months prior to the inquest, the volunteer brigades associated with the City of Albany responded to over 150 callouts in relation to fires, which gives some sense of the regularity of these events in the region.<sup>23</sup>
19. The way the volunteer brigades are funded is not straightforward, with the City of Albany being a collection agent for the emergency services levy for the State government, who then use the levy to fund all emergency services across the state. The City of Albany, like all the local governments, makes application through a grant funding system for operational grants to run their emergency services, which includes SES and the volunteer bushfire brigades. The grants cover both operational costs and capital replacement (such as the firefighting vehicles and equipment) and they are coordinated by what was FESA, and is now DFES.<sup>24</sup> DFES also sets and approves the standards and requirements for the equipment.<sup>25</sup>
20. DFES has a Regional Operations Centre in Albany, which is staffed by DFES staff, but it does not have its own fire appliances for use in bush fires in the regional areas.<sup>26</sup> The local DFES staff will, however, assist with the management of local bush fires and are actively involved in assisting the local community to implement strategies and activities that assist in the prevention of bush fires.<sup>27</sup>
21. In addition to the City of Albany, coordinated volunteer fire brigades and the locally based DFES staff, the Department of Parks and Wildlife, formerly DEC, is a third body involved in active fire prevention and suppression in the City of Albany. Their staff are often involved in fire-related activities such as controlled burning and attending bushfires on

<sup>22</sup> T 544 – 547.

<sup>23</sup> T 543.

<sup>24</sup> T 545 – 546.

<sup>25</sup> T 546.

<sup>26</sup> T 145.

<sup>27</sup> Exhibit 12.

Parks and Wildlife managed land, such as State Forest and National Parks.<sup>28</sup>

22. The three agencies all participate in the control and management of fires in the region. It was emphasised by witnesses that it is important to have strong relationships and a collaborative approach between the agencies, and the general view expressed was that this was usually the case in the Albany region.<sup>29</sup> The Black Cat Creek Fire is a case in point, as it was a multi-agency managed fire, with representatives from all three agencies in attendance and the general evidence of witnesses was that the people involved worked collaboratively and were respectful towards each other and their varying areas of expertise.

### **INITIAL RESPONSE TO THE FIRE**

23. At the time of the initial report, the main fire was on private property within the City of Albany, so the responsibility for the fire was with the City of Albany. Accordingly, the FESA Fire Control Centre contacted the Albany Ranger Administrative Officer. Mr Brian Pickford, who had recently commenced as the Coordinator for Emergency Management and Community Safety for the City of Albany, was informed of the call. Prior to joining the City of Albany Mr Pickford had 35 years' specialised experience in fighting fires on a very large scale, primarily on the east coast of Australia. He had a high level of expertise in how to fight bushfires, but this was the first significant fire he was involved with in Albany and he was still learning about the process of how things were done in Western Australia in terms of the various agencies and legislation.<sup>30</sup>
24. Mr Pickford attempted to make contact via radio with Mr Ken Johnson, who was the after-hours contact for the City of Albany Bushfire Brigade Organisation. Mr Johnson is a Deputy Chief Bushfire Control Officer, working in a volunteer capacity, who maintains a radio control point for the bush fire brigades for the City of Albany.<sup>31</sup> He performs his role from his home in Milpara. Mr Johnson's radio call sign is 'South West 1'.<sup>32</sup>
25. After failing to reach Mr Johnson, Mr Pickford called the Kalgan Bushfire Brigade direct by radio. He spoke to Mr Brent Findlay, who volunteered as the Deputy Chief Bushfire Control Officer with that brigade, as well as being the call-out coordinator and brigade chaplain.<sup>33</sup> Mr Pickford asked Mr Findlay to mobilise the Kalgan Bush

<sup>28</sup> T 529; Exhibit 12.

<sup>29</sup> T 547.

<sup>30</sup> T 601 – 602, 615 - 616.

<sup>31</sup> T 35, 603; Exhibit 2, Tab 1.

<sup>32</sup> T 35; Exhibit 2, Tab 1.

<sup>33</sup> T 54.



Fire Brigade to the reported fire and provided Mr Findlay with the location of the reported fire at 372 Two Peoples Bay Road in Kalgan.<sup>34</sup>

26. Shortly afterwards Mr Johnson contacted Mr Pickford and advised he was now aware of the fire. Mr Johnson then took over the related radio traffic although Mr Pickford continued to monitor it.<sup>35</sup>
27. After speaking to Mr Pickford, Mr Findlay spoke to another member of the brigade and then went to the Kalgan volunteer bushfire brigade shed and readied a fire truck so that it could be driven quickly by other brigade members, before driving himself in the Kalgan light tanker to the address at Two Peoples Bay Road.<sup>36</sup>
28. Mr Findlay was the first of the firefighting crew to arrive at the homestead. He arrived at approximately 9.50 am.<sup>37</sup> On arrival he spoke to Mr Halling, who told Mr Findlay that he had seen the fire travelling towards vehicles and fuel drums situated immediately south of the homestead. Mr Findlay assessed the fire boundary himself and identified that the fire had not yet reached the pine plantation land. He described the fire as not big at that stage, but “there was a nice breeze behind it,”<sup>38</sup> which concerned him. Mr Findlay radioed Mr Johnson and indicated they might need fire and rescue’s assistance (meaning FESA trucks) as he wasn’t sure how long his other brigade members would take to arrive.<sup>39</sup> Mr Findlay then began fire suppression duties.
29. After speaking to Mr Findlay, Mr Johnson dispatched a number of additional Bush Fire Brigade resources to the fire.<sup>40</sup> Mr Johnson also began liaising with DEC due to the proximity of the fire to the pine plantations. The pines belonged to the Forest Products Commission but there was an agreement with that agency that DEC staff would assist in protecting these assets in a fire.<sup>41</sup> In response to Mr Johnson’s call, DEC management mobilised staff to assist with the fire suppression. A number of DEC and FPC resources were deployed, including Mr Greg Freebury in a light utility and a Heavy Duty tanker 155 (HD155) with Mrs Bearfoot and Timothy Wellstead (another DEC staff member) on board.
30. Mrs Bearfoot had left for work that day at about 7.50 am dressed in workboots, green work pants, and a green and yellow shirt. She usually kept a bag in her Ford ute containing her fire-fighting protective equipment and a spare pair of clothes as well, but because it was early

<sup>34</sup> T 54, 603; Exhibit 1, Tab 2, p. 9; Exhibit 2, Tab 1.

<sup>35</sup> T 603; Exhibit 2, Tab 1.

<sup>36</sup> T 55.

<sup>37</sup> T 55.

<sup>38</sup> T 56.

<sup>39</sup> T 57.

<sup>40</sup> T 56; Exhibit 1, Tab 2, p. 10.

<sup>41</sup> T 299.

in the fire season she didn't have it with her.<sup>42</sup> Mr Wellstead recalls he was working in the yard when they received the fire call at about 10.00 am, and was told by his superiors to go out to the fire at Black Cat Creek. Mrs Bearfoot apparently called her husband at about 10.15 am to tell him that she would not be home for lunch as she was attending the fire.<sup>43</sup>

31. Mr Wellstead drove the HD 155 and Mrs Bearfoot came with him as the passenger. They stopped on the way at Mrs Bearfoot's house to get her personal protective equipment. While Mrs Bearfoot was collecting her things Mr Wellstead took the opportunity to put on his full green PPE, often referred to as a 'kermit' or 'frogsuit' due to its green colour, as well as two pairs of woollen socks and his designated fire rated boots. He had gloves that he put in his jacket pocket and his helmet was on the dashboard of the truck.<sup>44</sup> Mr Wellstead explained at the inquest that he is a firm believer in putting on the full frog suit and had always made it his personal practice, dating back to his time in the volunteer fire brigade. His thought process was, "Well, if you get into a burnover, it would be the one you don't see coming and you're not going to have time to put that stuff on,"<sup>45</sup> which in the facts of this case was unfortunately proven to be right.
32. Mr Wellstead recalled that, after collecting her bag, Mrs Bearfoot was wearing her normal DEC issued work trousers and shirt and she put her jacket on over the top.<sup>46</sup> They then headed out to the fire. Mr Freebury had gone straight to the fire, so he had arrived there ahead of them and told Mr Findlay that the Heavy Duty tanker was on its way.<sup>47</sup>

### **ARRIVAL OF FIRE FIGHTING CREWS**

33. At the time the first of the additional fire crews started to arrive, Mr Findlay noticed there was a wind change and the wind was now coming from the north-west.<sup>48</sup> As Mr Findlay heard the sirens of the arriving crews he ceased attempting to suppress the fires and drove to the top of the driveway near the house so that he could direct the trucks.<sup>49</sup>
34. Mr Freebury spoke to Mr Findlay and offered to do a reconnaissance of the fireground. He then drove around the pine plantation and noted the fire was still relatively small and the fire behaviour was relatively mild

<sup>42</sup> T 499; Exhibit 1, Tab 15 [14] – [16].

<sup>43</sup> Exhibit 1, Tab 15 [17].

<sup>44</sup> T 499 – 500; Exhibit 1, Tab 10.

<sup>45</sup> T 500 - 501.

<sup>46</sup> Exhibit 1, Tab 10, p. 7.

<sup>47</sup> T 354.

<sup>48</sup> T 57 – 58.

<sup>49</sup> T 58.

at that time, travelling at a couple of hundred metres per hour with a northerly wind. There was still relatively light-coloured smoke. Mr Freebury noted the fire was in a relatively inaccessible area, so there was still considerable work that needed to be done and it would need machinery to do most of it.<sup>50</sup> When Mr Freebury returned to the house he saw HD 155 and had a brief chat with Mr Wellstead and Mrs Bearfoot. He told them it was a brigade fire and they were there to assist. He then directed them to an area that later became Sector Alpha. They met with the brigade members there in Kalgan 3.4 and started to help control the fire in that section and assist with some backburning. Mr Wellstead recalls the flames were not high and the fire was quite manageable at that time.<sup>51</sup>

35. At approximately 10.45 am, based on a recommendation from Mr Johnson, Mr Pickford dispatched Mr Garry Turner, the City of Albany's Fire Safety Officer, to pick up and deploy the Forward Control Van to the fire ground.<sup>52</sup> The Forward Control Van is a caravan that is designed for use by the Incident Management Team as a command post to manage a fire or emergency situation. It is set up with two way radios, whiteboards, a fax, computer and other pieces of equipment necessary for that purpose.<sup>53</sup> Mr Turner first printed out some large aerial photographs of the fireground and spoke to someone at DEC and FESA about the fire. At 10.44 he went to the City of Albany fire shed and by 11.05 am he had the van hooked up and headed to the fire.<sup>54</sup>
36. Mr Pickford also headed out to the fire to provide assistance to Mr Findlay, as required. Mr Pickford arrived at the scene at approximately 11.05 am, about the time Mr Turner was setting off with the van.<sup>55</sup>

### **THE INITIAL INCIDENT MANAGEMENT TEAM**

37. When Mr Pickford arrived he had a discussion with Mr Findlay about management of the fire. Mr Findlay described himself as being "nervous, because I don't like fires,"<sup>56</sup> and he initially assumed Mr Pickford would take over from him. However, Mr Findlay recalls that Mr Pickford suggested to him that as Mr Findlay had appropriate local knowledge of the area and Mr Pickford would be there to support him, it would be appropriate for Mr Findlay to remain in control and get some more experience as an Incident Controller. Mr Findlay had been an Incident Controller at some small fires at that stage but had not managed any larger fires.<sup>57</sup> In that context, Mr Findlay agreed to be the

<sup>50</sup> T 354 – 356.

<sup>51</sup> T 356, 501 - 504.

<sup>52</sup> T 94, 603.

<sup>53</sup> Exhibit 1, Tab 2, p. 11; Exhibit 2, Tab 1.

<sup>54</sup> T 95.

<sup>55</sup> T 603 - 604.

<sup>56</sup> T 58.

<sup>57</sup> T 66.



Incident Controller and Mr Pickford would remain and assist in a logistical role.<sup>58</sup>

38. Mr Pickford's recollection is largely the same as Mr Findlay's, although from his perspective there was never any thought that he (Mr Pickford) would take over Mr Findlay's role or function. It was in his mind that he was there to support the brigades and incident structure that was in place. So Mr Pickford just assumed that Mr Findlay would continue in the incident controller role until the fire escalated further, at which time higher-ranking officers might become involved. Mr Pickford agreed, however, that Mr Findlay would probably have felt reassured by having Mr Pickford there as support and he took on the Logistics Officer role to assist.<sup>59</sup>
39. Mr Pickford then set up the Australasian Inter-Service Incident Management System (AIIMS) battleboard from his vehicle and placed the T-cards of the fire units already there onto the board.<sup>60</sup>
40. Mr Turner arrived at the homestead with the Forward Control Van at approximately 11.25 am.<sup>61</sup> The command post was then established, working from the incident control van (ICV) in an open grassed area near the homestead.<sup>62</sup> This site was chosen as being the logical spot, given it was next to the house, which had power and water, and it was on green grass in an open area with sufficient room for cars to park and room for people to move around and come and go safely. It was also far enough back from the pine plantation to be deemed safe from the fire.<sup>63</sup> The location of the ICV was then also the control point for where people coming and going from the fireground could come through and be coordinated, with their T-cards being placed on the battleboards that had been moved into the ICV.<sup>64</sup>
41. Shortly after the van arrived Mr Findlay left the ICV to set up a hydrant on Two Peoples Bay Road to refill appliances. While Mr Findlay was away, for a period of approximately 20 minutes, Mr Pickford was left in charge. Upon Mr Findlay's return a decision was made to split the fire ground, which was getting larger, into two sectors so that they could be easily managed. The two sectors were named 'Alpha' (on the eastern boundary) and 'Bravo' (on the western boundary), At that time the fire was encroaching on DEC assets, including the pine plantation in Sector Alpha, and potentially the adjacent Two Peoples Bay Nature Reserve. As there were more DEC resources in Sector Alpha, the DEC firefighters

<sup>58</sup> T 58.

<sup>59</sup> T 613 – 614.

<sup>60</sup> T 604.

<sup>61</sup> T 95, 605.

<sup>62</sup> T 58.

<sup>63</sup> T 59 – 60, 85, 110 – 111.

<sup>64</sup> T 96 – 97.

were primarily directed to that area while the volunteer firefighters were sent to Sector Bravo.<sup>65</sup>

42. Around the time the ICV was set up and established, it was decided that Mr Findlay would remain as the Incident Controller, Mr Greg Freebury from DEC would be the Liaison Officer, Mr Pickford would continue in the Logistics Officer role and Mr Turner would be the Planning Officer. They formed the Incident Management Team (IMT) at that time.<sup>66</sup>



*Exhibit 1, Tab 2, p. 12 – Depicting sectors, burnover location and park boundary. Fire origin, location of burnover and final fire perimeter (hatched). Yellow line is western boundary of Two Peoples Bay Nature Reserve. The large white patch is a sand dune system.*

43. Just before midday Mr Pickford spoke by radio to a City of Albany officer and confirmed that Mr Findlay, as the Incident Controller, had classified the fire as a ‘Type 1’, which was a reference to a level one fire under the AIIMS.
44. There was a discussion around this time between Mr Findlay and Mr Turner in relation to whether DEC might wish to take control of the fire. Mr Turner recalls that he then spoke to a DEC staff member, Mr Mike Shephard (the District Manager for Albany), who declined as

<sup>65</sup> T 60, 605; Exhibit 1, Tab 2, p. 12,

<sup>66</sup> T 97.

he considered it would be up to FESA to take control.<sup>67</sup> Mr Shephard does not recall having been asked about whether he thought DEC would take control of the fire and suggested that Mr Turner was mistaken as to whom he spoke to from DEC, as Mr Shephard did not even leave the DEC office until after midday.<sup>68</sup> It seems from other evidence that it was actually Mr Freebury that Mr Turner spoke to about this issue.

45. Mr Freebury recalls talking to Mr Turner at about 12.15 pm and discussing the fact that the fire had crossed the track south of the creek and was heading towards the coast at a time when the relative humidity had dropped, which would encourage stronger fire behaviour. Mr Freebury suggested to Mr Turner that this might be a ‘trigger point’ and that they should consider contacting Mr Hilder at DEC to get five or six DEC trucks to come from Walpole, which was then done by either Mr Turner or Mr Freebury on Mr Turner’s behalf.<sup>69</sup> Mr Freebury also recalls being asked by Mr Turner at some stage, “Wouldn’t you guys normally take over control of the fire in these situations?” Mr Freebury replied that he wasn’t sure of the process anymore as he mistakenly thought there had been a change to the procedures in this regard and it might be more a role for FESA under s 13 of the *Bush Fires Act 1954* (WA).<sup>70</sup> It appears no further official request was made to the DEC beyond this conversation.
46. At about 12.30 pm Mr Pickford spoke to Mr Johnson on the radio and asked him to contact FESA and advise them that there was a significant fire event and that the City of Albany wanted to hand control of the fire to FESA. There appears to have later been some confusion as to whether the request was based on funding purposes or because of the size of the fire or because the nature reserve was going to come under threat, or all three.<sup>71</sup> Mr Pickford’s evidence was that he asked Mr Turner and was told that all three reasons were relevant to the making of the request.<sup>72</sup>
47. Gary Logan was employed by FESA as the Manager for the State Emergency Service for the Great Southern Region East District.<sup>73</sup> Mr Logan had worked with the SES since 1982 and was the Manager of SES throughout the Great Southern Region since 2002. He was trained in the AIIMS in 2010 and 2012 and he had significant prior experience of dealing with emergency situations at various levels.<sup>74</sup> On the day of the fire Mr Logan was at the FESA regional office in Albany and was acting in the role of Superintendent and Regional Duty Coordinator for

<sup>67</sup> T 61, 98.

<sup>68</sup> T 339, 349.

<sup>69</sup> T 361.

<sup>70</sup> T 363, 379.

<sup>71</sup> T 23-24, 30, 32, 98, 607; Exhibit 1, Tab 2, p. 13.

<sup>72</sup> T 616.

<sup>73</sup> T 140.

<sup>74</sup> T 141.



the Great Southern area at that time.<sup>75</sup> During the morning Mr Logan had been liaising with Mr Turner from the City of Albany, FESA District Officer Russell Gould and Vince Hilder, the DEC District Fire Coordinator, about the fire. Based on those conversations Mr Logan had gained an understanding that the fire was under the control of the City of Albany, with some assistance from DEC, and it was a relatively low level incident.<sup>76</sup> Mr Logan was also aware that the ICV had been dispatched and they had mapping resources on board.<sup>77</sup>

48. At 12.38 pm Mr Johnson contacted Mr Logan and made the request for FESA to take control of the fire, as per his discussion with Mr Pickford. It seems from his evidence that Mr Johnson believed the fire had been classified as a 'Type 2' fire by this time, although the other evidence suggests this occurred sometime later.<sup>78</sup> Either way, it was discretionary at that stage, as only a Level 3 fire requires FESA to take overall control.<sup>79</sup> Mr Johnson's evidence was that he understood he made the request for DFES to take control based on their need for experienced DFES staff to take control and run the fire, and cost was a secondary issue.<sup>80</sup>
49. Mr Johnson recalls that Mr Logan told him there were only two fire officers available and he interpreted this response as indicating that DFES would not assist.<sup>81</sup> Mr Johnson relayed his conversation with Mr Logan to members of the IMT and he then gave the same information to Mr Stuart Jamieson, the Manager of Compliance and Community Safety at the City of Albany. Mr Jamieson apparently then spoke to someone at the State Operations of DFES who then spoke to Mr Johnson and indicated that they were going to take some action. Shortly afterwards Mr Johnson heard that one of the local fire officers was going to the fire, so Mr Johnson assumed this meant that DFES had taken over control of the fire.
50. Mr Logan's recollection is that Mr Johnson did not make the request for DFES to take over the fire because the fire was particularly large or unmanageable or dangerously close to the pines, but rather due to a concern about the associated costs of managing the fire.<sup>82</sup> In and of itself, cost was not specified as a trigger for FESA to take control.<sup>83</sup> Mr Logan's evidence was that he did not agree or refuse the request, but indicated he only had two fire managers available at the regional

<sup>75</sup> T 141.

<sup>76</sup> T 143; Exhibit 1, Tab 2, p. 13.

<sup>77</sup> T 142.

<sup>78</sup> T 45 – 46.

<sup>79</sup> Exhibit 12.

<sup>80</sup> T 45 – 46.

<sup>81</sup> T 45.

<sup>82</sup> T 144, 190.

<sup>83</sup> T 184.

office at the time and that he would send one of them (Mr Gould) to the scene to assess the situation and make an informed decision.<sup>84</sup>

51. Mr Logan acknowledged at the inquest that he may have inadvertently given the wrong impression to Mr Johnson during their phone call that he was refusing to take control because he was short of staff.<sup>85</sup> Mr Logan stated that this was not the case. He admitted that he was concerned about being short staffed, and he made mention of this to Mr Johnson, but he denied that this played a major role in his decision whether or not FESA should take over the fire. Rather, he said he needed more information about the situation first, so he sent Mr Gould to make a detailed assessment to assist him in making the decision.<sup>86</sup> Mr Gould is a very experienced firefighter, having begun his firefighting career in 1978 and having gained extensive experience in dealing with all levels of bushfires in his nearly 40 years of employment in fire management.<sup>87</sup> Mr Logan deferred to Mr Gould's firefighting knowledge and experience and was intending to rely upon Mr Gould's judgment in assessing the fire.<sup>88</sup>
52. Mr Gould, who has worked for the agency that is now DFES and was previously FESA, for many years, admitted that he felt that the understaffing of the local FESA office and in the Great Southern Region at the time made it difficult for the FESA staff to supply the sort of support that would have been ideal, which was a source of frustration for both him and Mr Logan.<sup>89</sup> Mr Gould felt it had a particular impact on how they were able to manage the fire after the burnover, when the available crews were reduced even further, rather than during the morning before the burnover occurred.<sup>90</sup>
53. Mr Logan explained at the inquest that the reason they were underresourced was because some people were on holidays and some fire managers had been deployed to the Kimberley to assist in relieving positions up there as that region was in the middle of its peak fire season.<sup>91</sup> Although it may not have ultimately affected their decision making as to whether to take control of the fire, it is clear that the underresourcing did play upon Mr Logan's and Mr Gould's minds, which would have added to the stress of the situation.
54. Mr Gould left the FESA Regional Office at approximately 12.47 pm and drove to the fire ground to conduct an assessment. At the same time Mr Logan began liaising with the FESA State Hazards Operations

<sup>84</sup> T 146 – 147; Exhibit 1, Tab 2, p. 14.

<sup>85</sup> T 329.

<sup>86</sup> T 159, 172 – 173, 184, 190-191, 196.

<sup>87</sup> T 203.

<sup>88</sup> T 204.

<sup>89</sup> T 267.

<sup>90</sup> T 268.

<sup>91</sup> T 191.

Officer and preparing relevant documentation in the event that FESA took carriage of the fire.<sup>92</sup>

55. At approximately 1.06 pm Mr Turner contacted Mr Logan via radio and requested an estimated arrival time for Mr Gould. During this conversation a problem with a lack of communication signals (telephone and computer data) was discussed, which prevented the IMT from obtaining information including spot forecasts. Mr Logan told Mr Turner that Mr Gould had a hard copy of the forecast and would be bringing it to site, although it seems this did not actually occur.<sup>93</sup> At the inquest Mr Logan could recall having seen the spot forecast on the BoM site while Mr Gould was still there but could not recall if he had printed it off or not before Mr Gould left.<sup>94</sup>
56. Mr Gould explained at the inquest that he had experienced delays shutting down his computer and had also spent time organising maps and extra water, and in the confusion he didn't get a chance to look at the weather report online or obtain a written copy of the report. He also assumed that, as the fire had been running for some time, the IMT would already have a copy of the report as this was standard practice.<sup>95</sup> Mr Gould was unaware that people were told by Mr Logan that he was bringing a copy of the weather forecast. Further, despite Mr Turner being told Mr Gould was bringing a copy of the forecast with him, no one asked Mr Gould for it when he arrived at the ICV, so he still did not realise he had been expected to bring it.<sup>96</sup> As is identified later, around 1.00 pm another person, Mr Mike Shephard from DEC, arrived at the ICV and provided a copy of the printed report to Mr Turner, which might explain why he didn't follow it up with Mr Gould.

## **WEATHER FORECAST**

57. A 'spot weather forecast' is a 12 hour forecast containing all meteorological factors that may impact on, or relate to, fire spread. These include temperature, humidity, wind speed and direction.<sup>97</sup> It is issued by the Australian Government Bureau of Meteorology.
58. Mr Johnson contacted the Bureau of Meteorology just before 11.00 am to request a spot weather forecast for the area of the fire. He was informed that DFES had already made a similar request and Mr Johnson was asked if he would like a copy of the forecast that had been produced in response to that request. He indicated that he would, and at 11.10 am, the spot weather forecast was provided by facsimile to

<sup>92</sup> T 147; Exhibit 1, Tab 2, p. 14.

<sup>93</sup> T 254 – 255; Exhibit 1, Tab 2, p. 15.

<sup>94</sup> T 155.

<sup>95</sup> T 205, 257

<sup>96</sup> T 254 - 255.

<sup>97</sup> Exhibit 1, Tab 2, p. 39.

Mr Johnson by Bureau of Meteorology. The forecast was for the Albany-Kalgan area for Friday, 12 October 2012. The information issued was current until 11.00 pm that evening.<sup>98</sup>

59. Mr Johnson transmitted the information contained on the spot forecast via the operational/fire ground radio channel (101) to Mr Pickford at some time between 11.20 and 11.45 am. This broadcast was significant in later events, as while Mr Johnson read out most of the information contained on the spot forecast, he inadvertently omitted to read out the following text:

**“Significant Wind Change Winds shifting WSW 18km/hr 1500/1700 local time.”<sup>99</sup>**

60. The information that Mr Johnson did read out, came mostly from a table showing forecast conditions at set times, as shown below:

Forecast conditions				
Time (WST)	Temp (C)	DewPt (C)	RH (%)	Wind (Km/h)
1100	30	-7	9	NNW 33 gusting 55
1400	31	3	17	NW 33 gusting 55
1700	27	10	34	WSW 18
2000	21	13	60	W 18
2300	17	13	77	WNW 22

Significant Wind Change Winds shifting WSW 18km/hr 1500/1700 local time.

Weather/Remarks: Drizzle developing in the afternoon.

*Exhibit 1, Tab 2, p. 41 – Spot forecasts for 34.94S 117.82E valid for 12 October 2012 (Bureau of Meteorology)*

61. As is apparent from that table, without the additional information about the wind change to WSW possibly starting at 1500 hrs (3.00 pm), the information on the chart indicates the forecast wind change will have occurred by 1700 hrs (5.00 pm), without indicating when it might occur within the three hour window. To the uneducated it might suggest that the wind will change close to, or around, that time. As for experienced firefighters, while they were aware a wind change might occur at any time, as is detailed below the information in the table gave many of them the impression there was a margin of safety against a wind change prior to about 4.00 pm.
62. Mr Johnson gave evidence at the inquest. He explained that, looking back, he believes he missed the additional wind change information because it was printed in lower case typing and in its own box. He did not realise he had overlooked this information until much later that day, after the burnover had occurred.<sup>100</sup> Looking at a copy of the spot

<sup>98</sup> T 39; Exhibit 1, Tab 2, p. 39.

<sup>99</sup> Exhibit 9.

<sup>100</sup> T 40, 48.



weather forecast for that day, there is some merit in what Mr Johnson says, as the font is very small and the significant wind change information is below the table and not highlighted in any marked way.<sup>101</sup>

63. However, Mr Johnson acknowledged he had been reading the same type of weather forecast for about 20 years at that time, produced in the same or similar format, and in that context Mr Johnson said “I’ve got no idea how I missed it.”<sup>102</sup> He expressed genuine regret for his mistake.<sup>103</sup> Whilst Mr Johnson’s error played a significant role in the events that occurred, it must be considered within the context that he was a retired farmer acting in this bushfire brigade role purely in a volunteer capacity, providing a much needed community service. Mr Johnson was nearly 70 years old at the time of the incident, and had been involved in firefighting and control as a volunteer in Western Australia for more than 50 years. His lengthy service as a volunteer has been recognised with state and national medals for service.<sup>104</sup> I have no doubt on this day Mr Johnson was doing his best to provide the relevant information to the people on the fireground and his omission was simply an unfortunate mistake that can happen to anyone when performing under pressure.
64. Mr Pickford wrote down the information provided by Mr Johnson on a piece of paper and provided the information to Mr Findlay and Mr Turner and it was put on the whiteboard.<sup>105</sup> This had the consequence that Mr Findlay and Mr Turner operated from that time onwards on the belief that the wind change was forecast for sometime around 5.00 pm.<sup>106</sup> I note at the inquest that Mr Findlay did suggest in his evidence that he did know about the 3.00 pm wind change warning, but it became apparent later in this evidence that he had most likely become confused by conversations with people after the event. In that regard, I note that Mr Findlay spoke to a police inspector just prior to 3.00 pm and told her that the expected wind change was at 5.00 pm, which lends further weight to the conclusion that Mr Findlay was working off the information provided by Mr Johnson at that time.<sup>107</sup>
65. In ordinary circumstances the IMT members would obtain a hard copy of the forecast, or look at the information on the internet, themselves. However, in this case the ICV had no internet connectivity or phone connection due to a fault, so the members of the IMT at the fire ground could not receive a fax or email copy of the actual forecast and were reliant on the transmitted information from Mr Johnson unless and

<sup>101</sup> Exhibit 1, Tab 30A.

<sup>102</sup> T 41.

<sup>103</sup> T 53.

<sup>104</sup> T 35.

<sup>105</sup> T 606, 623.

<sup>106</sup> T 100, 102 - 103.

<sup>107</sup> T 62, 64, 70 - 71, 73 - 74. 132.

until someone else brought a hard copy to them.<sup>108</sup> This inability to initially source their own copy seems to have compounded Mr Johnson's initial error as there was no way to doublecheck the correctness of the information he had provided at that time.<sup>109</sup>

66. Nevertheless, it is important to note that a hard copy of the spot weather forecast was eventually provided to the IMT members by Mr Shephard at about 1.00 pm, two hours prior to the burnover incident. I will elaborate on this further below.
67. Mr Freebury, who later became Alpha Sector commander, recalled that he became aware of the forecast information at approximately 11.30 am when he attended the ICV. His recollection was that he was told the expected time of the wind change was 5.00 pm. Mr Freebury was told this information verbally, but also saw it written down later on a whiteboard at the ICV at approximately midday.<sup>110</sup> The accounts of various other personnel on the fire ground echoed the belief of Mr Freebury that the wind change was expected at about 5.00 pm.<sup>111</sup>
68. Mr Gould confirmed that when he arrived at the fire ground, he was told the information that had been written down by Mr Pickford and he then worked on the same assumption as the other IMT members, namely that the wind was forecast to change at approximately 5.00 pm.<sup>112</sup>
69. As mentioned above, Mike Shephard from DEC had brought some maps and a hard copy of the spot weather forecast to the control point when he arrived at the ICV at sometime around 1.00 pm.<sup>113</sup> He couldn't recall if he had multiple copies or only a single copy of the spot weather forecast, but he was positive he took at least one copy with him to the fire. He indicated that he didn't study it closely or digest the information, but simply took it with him in case it might be needed. He recalled that when he arrived he found out that the IMT did not have a hard copy of the weather forecast, so he gave them his personal hard copy. To the best of Mr Shephard's recollection he gave the hard copy to Mr Turner and it was then put on the whiteboard next to where the handwritten version of the spot weather forecast was recorded.<sup>114</sup>
70. Mr Freebury had a discussion with people in the ICV about the weather forecast around the time that Mr Shephard had arrived and he recalls Mr Shephard pointed to the whiteboard. Mr Freebury looked at the whiteboard but can't recall if he saw there was a printed hard copy of the weather forecast there. He only read the handwritten version that

<sup>108</sup> T 41.

<sup>109</sup> T 41.

<sup>110</sup> Exhibit 1, Tab 2, p. 40.

<sup>111</sup> Exhibit 1, Tab 2, p. 40.

<sup>112</sup> T 209.

<sup>113</sup> T 362.

<sup>114</sup> T 303, 335 – 339, 349 – 350.

was on the whiteboard, and recalls that the talk at the ICV at that stage was still about a southwest wind change at 5.00 pm. It appears from this evidence that at the time Mr Shephard provided the printed copy to the IMT, no one took the time to read it and compare it to the handwritten version that had been obtained over the radio. Therefore, they were still working on the assumption that the wind change was not predicted to occur until around 5.00 pm.<sup>115</sup>

71. If one of the members of the IMT had taken the opportunity to read the hard copy of the weather forecast and make the comparison, it seems likely that they would have seen the omitted portion about the significant wind change potentially occurring at 3.00 pm, and alerted the relevant personnel. However, as I detail below, even experienced DEC staff who did read the hard copy, also missed the same information that Mr Johnson omitted to read out. Therefore, while I would like to think that at least some of the experienced members of the IMT would have spotted that omitted information, I can't conclude that would definitely have been the case. It does, however, seem perplexing that people were asking specifically for a hard copy to be brought to the ICV if no one was going to bother to take the time to read it.
72. It must also be remembered that the forecast is merely a prediction of what the meteorologists anticipate may occur, within a broad timeframe. There was considerable evidence given that experienced firefighters understand that wind changes can occur at any time, so the spot forecast is simply a guide to assist them in anticipating what may occur. As Mr Johnson stated, "it would not be the first time that the forecast had happened a bit earlier."<sup>116</sup>
73. Local knowledge of the winds was an important factor to add to the information provided in the forecast. Mr Turner (a member of the IMT) acknowledged that he would rely on local knowledge, as the people who live there have a good understanding of what the Albany weather is like.<sup>117</sup>
74. The particular wind change that was forecast on this day is known as the 'Albany Doctor' (a bit like the 'Fremantle Doctor' in Perth) and it was generally known by locals that it could come in earlier.<sup>118</sup> However, Mr Gould (another member of the IMT that day) also observed that living on the coast in Albany, he was aware the "wind can be quite fickle,"<sup>119</sup> with winds coming and going during the day. That day it appeared there was a northerly wind blowing very strongly with a heat trough coming through, and in Mr Gould's experience in those

<sup>115</sup> T 362 – 363, 385.

<sup>116</sup> T 43.

<sup>117</sup> T 120.

<sup>118</sup> T 43.

<sup>119</sup> T 206.

conditions the sea breeze might appear on the coast but not push in very far against a strong trough line. Accordingly, although he was aware of at least one report over the radio of a wind change on the coast somewhere while he was making his way to the ICV, he was not concerned at that stage.<sup>120</sup>

75. Another experienced local member of the IMT, Mr Freebury, acknowledged that he was not naïve enough to think the wind wouldn't change until spot on 5.00 pm, and this was echoed by other firefighters on the ground including Mr Wellstead.<sup>121</sup> However, even if they were anticipating that the wind would probably change earlier than 5.00 pm, without the added information of a predicted 3.00 pm – 5.00 pm window, Mr Freebury gave evidence that his local knowledge combined with the forecast suggested to him that the wind change wouldn't be likely before 4.00 pm.<sup>122</sup>
76. Nevertheless, as Mr Turner explained, all firefighters are very conscious about wind change, as wind changes are critical, so they will still always be looking for visual signs when on the fireground.<sup>123</sup> This was the case with Mr Freebury, who gave evidence that he was looking for any signs of the forecast wind change throughout the afternoon from an early stage. However, he explained that where you are on the fireground can affect your ability to see those signs.<sup>124</sup> There is also evidence, which I will detail later, that the usual signs that might assist an experienced firefighter to detect a wind change were not present on this occasion due to the weather conditions, which prevented the firefighters on the fireground from detecting the wind change themselves.
77. All of these errors and factors combined on this day with the fatal result that at 3.00 pm when the wind changed, right at the start of the window for the significant wind change forecast by the Bureau of Meteorology, there was no one in the IMT or amongst the firefighters on the fireground who expected it.

### **ONGOING MANAGEMENT OF THE FIRE**

78. During his conversation with Mr Logan at 1.06 pm, Mr Turner had discussed the fire travel and actions taken to suppress it at that stage. Mr Turner indicated that the fire had jumped into the pine plantation on the western boundary and made a run down and they were putting in containment lines to try and contain the fire within the private property to the east. It was discussed that there was a need for closure

<sup>120</sup> T 206 – 207.

<sup>121</sup> T 503.

<sup>122</sup> T 367.

<sup>123</sup> T 120, 123.

<sup>124</sup> T 386.



of Two Peoples Bay due to the single entry/exit access point, which was done shortly afterwards. The fire reached the coastline shortly after.<sup>125</sup>

79. Mr Gould had arrived at the ICV at approximately 1.30 pm. He liaised with the IMT members, all of whom were people he already knew well through working on other fires, training, functions and social events.<sup>126</sup> Mr Gould recalls he was told the fire was uncontrolled and burning on private property, private pine plantation and Two Peoples Bay Nature Reserve.<sup>127</sup> He was also told there was a predicted wind change to the south-west at 5.00 pm, which came from the handwritten account of Mr Johnson's radio report.<sup>128</sup>
80. In considering whether FESA should take control of the fire at that time, Mr Gould took into account the following factors:
- The current IMT structure had working strategies and sectorisation already in place;
  - Additional fire appliances (from the City of Albany and DEC) and contract earth moving equipment had already been organised and were en-route;
  - He had worked closely with all the parties previously and had trained the Incident Controller Mr Findlay, so he was satisfied the IMT members were competent to manage the incident in its current state; and
  - The fire was relatively minor at that time.<sup>129</sup>
81. Overall Mr Gould thought the IMT was functioning quite well and being well managed by the City of Albany. In those circumstances Mr Gould saw no reason or justification for FESA to take over control of the fire at that point.<sup>130</sup> Mr Gould explained in his evidence that his usual practice was not to step in and take control as he believes it has a number of negative impacts on the locals, both in how it reflects upon them and also in enabling them to learn on the job. Therefore, he prefers to help the local firefighters through the process.<sup>131</sup>
82. Mr Gould recalls it was mutually agreed by the IMT members that there was no need for him (on behalf of FESA) to assume control of the fire, but rather it was appropriate for Mr Gould to fill the vacant IMT Operations Officer position.<sup>132</sup> Mr Findlay and Mr Turner have similar recollections of Mr Gould's arrival and adoption of the Operations Officer position. Mr Findlay indicated that he was still nervous about continuing as the Incident Controller at this time but the inclusion of

<sup>125</sup> Exhibit 1, Tab 2, p. 15.

<sup>126</sup> T 207.

<sup>127</sup> T 209.

<sup>128</sup> T 209.

<sup>129</sup> T 212 – 213, 263.

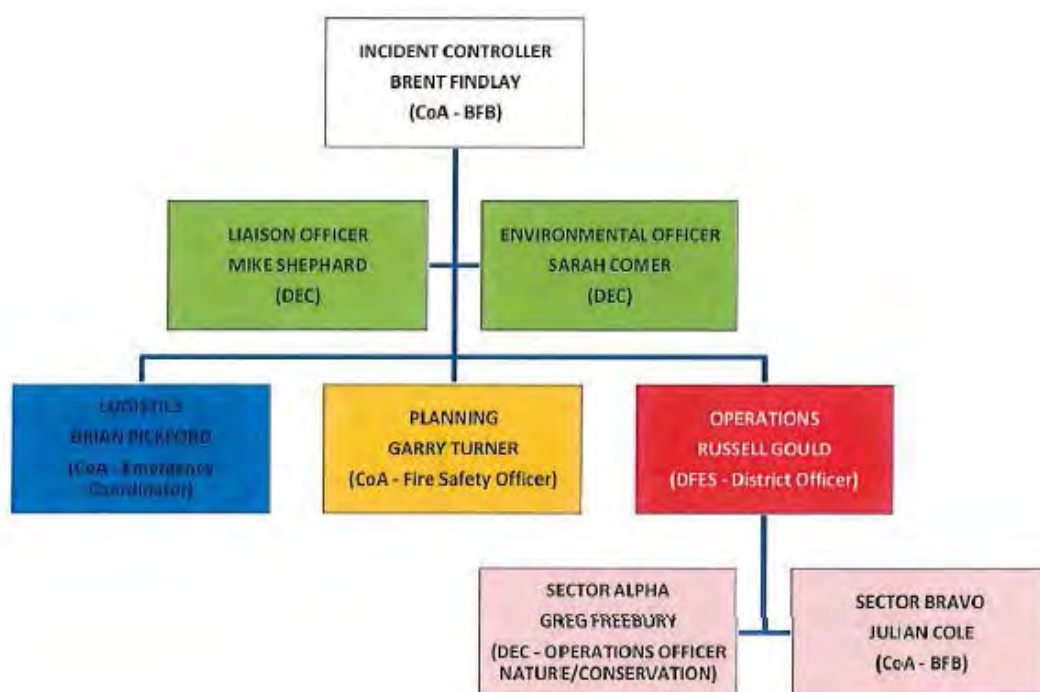
<sup>130</sup> T 207, 213, 264.

<sup>131</sup> T 213, 265.

<sup>132</sup> T 213.

Mr Gould in the IMT increased his confidence and he was happy to continue in his role as a mentoring/learning exercise, given the level of support and expertise provided by the other members of the IMT.<sup>133</sup>

83. Mr Pickford gave evidence that “experience has shown over many fires that trying to bring about change in the middle of an event can bring about devastating events.” In that respect, he agreed that given the IMT structure was working and there would have been inherent problems with changing it, he was happy at the time for the IMT structure to remain unchanged.<sup>134</sup>
84. In the period following Mr Gould’s arrival and assessment of the situation, the IMT then underwent a transition, including the addition of Mr Gould. The IMT was then configured as shown in the figure below.<sup>135</sup>



*Exhibit 1, Tab 2, p. 17 – Incident Management Team structure at 1400hrs at 372 Two Peoples Bay Road, Kalgan*

85. Around the time of the restructure of the IMT a radio message was received by Mr Pickford from ‘Bornholm One’ (Laurie Nissen from Bornholm Bushfire Brigade) indicating that he had just experienced a 180° westerly wind change at his location. Mr Nissen cautioned Mr Pickford that the wind change would be heading his way “very shortly” and estimated the wind speed at between 10 – 20 kilometres

<sup>133</sup> T 75, 99.

<sup>134</sup> T 616.

<sup>135</sup> T 215.

per hour. Mr Pickford then called Mr Johnson and asked for the wind direction at his location. Mr Johnson confirmed he had experienced a strong westerly wind change in Milpara. However while they spoke the wind then swung back to north-north-east.<sup>136</sup> Mr Pickford told the other IMT members and recommended that this information be transmitted to all units on the fireground. He was used to a 'red flag' system in place in the eastern states but was told by Mr Turner that was not used in Western Australia so he thought that this approach was the next best thing.<sup>137</sup> Mr David Wettenhall, a bushfire brigade volunteer who was on the fireground at this time, recalls hearing this message over the radio.<sup>138</sup>

86. It also appears from other evidence and radio conversations around this time that the fire was possibly escalating. At 1.52 pm a radio conversation from Mr Pickford to Mr Johnson is recorded advising that the fire was officially classified as a class two fire (indicating that the incident was escalated to a Level 2 fire under the AIIMS structure).<sup>139</sup> At 2.00 pm the incident was named by the IMT as 'Black Cat Creek Fire.'<sup>140</sup>
87. Shortly afterwards, Mr Johnson contacted Mr Logan and Mr Logan recalls that Mr Johnson advised him that the fire had been named the Black Cat Creek Fire, it was now classified as a Level 2 incident and control remained with the City of Albany.<sup>141</sup> This information was confirmed by Mr Gould in a phone call to Mr Logan about 20 minutes later, and Mr Gould also advised he had assumed the previously role of Operations Manager within the IMT.<sup>142</sup>
88. Following the previous plan formulated by the IMT, Sector Bravo was to be looked after by bushfire brigades and FPC units under the control of Sector Commander Julian Cole.<sup>143</sup> It was agreed that Sector Alpha would be under the control of Mr Freebury as the Sector Commander, with the support of a number of bushfire brigade units. A senior staff member from DEC described Mr Freebury as the most experienced sector commander that DEC have in the region, so he was well qualified for the position.<sup>144</sup> Mr Freebury also acknowledged that he had considerable experience as a sector commander and at the time he felt comfortable with taking on this role. He took on the role at about 2.00 pm.<sup>145</sup>

<sup>136</sup> T 607; Exhibit 1, Tab 2, pp. 18 – 19.

<sup>137</sup> T 617.

<sup>138</sup> T 296, 607.

<sup>139</sup> Exhibit 1, Tab 2, p. 19.

<sup>140</sup> Exhibit 1, Tab 2, p. 19.

<sup>141</sup> T 148.

<sup>142</sup> T 148.

<sup>143</sup> T 107.

<sup>144</sup> T 315.

<sup>145</sup> T 364.

89. At approximately 2.10 pm Mr Johnson received a transmission from another person who lived 15 to 20 kilometres west of Mr Johnson. This person stated he had noticed a 'sou'west' wind change at his place. Mr Johnson replied that he had noted the same wind change at his place a short while before but it had changed back again. From previous experience, Mr Johnson didn't think it was possible to predict how long that wind change would take to impact the fire location. He did not repeat the information to the IMT members as he was aware that someone at the ICV would be monitoring the radio channel and that other information had already been provided about a noticeable wind change nearby.<sup>146</sup>
90. Mr Gould acknowledged that this information was known to the IMT at this time but indicated that fluctuations do occur in the wind and given the reports were some distance away and the wind at that time was a very strong northerly influence wind, it didn't appear to them that there was going to be a wind change in the foreseeable short-term. This was consistent with what they knew of the Bureau of Meteorology forecast.<sup>147</sup> Mr Gould acknowledged that if they had been aware that the forecast was for a wind change any time in the window from 3.00 pm to 5.00 pm, this probably would have changed their strategy completely and they would have held off activities in the sector when the wind change reports began coming through until they had a better idea of what was occurring.<sup>148</sup>
91. Mr Findlay was asked whether this additional information about detected wind changes further away was communicated by the IMT to the people on the fire ground. He indicated he had given it a lot of thought over the years that had passed but couldn't recall if it had or not.<sup>149</sup> Mr Turner also couldn't recall, although he wasn't personally aware of those calls at the time they came in as he wasn't near the radio.<sup>150</sup> Mr Wettenhall, who was in Alpha Sector had recalled hearing the earlier radio report of a wind change, also recalled hearing this transmission, so it seems the information was being heard communicated to at least some of the people on the fireground.<sup>151</sup>
92. As noted earlier, there had been communication issues at the ICV throughout this time. In particular, there was no mobile telecommunications or internet data service available. This necessitated several of the IMT members to leave the ICV and travel some distance to make telephone calls back to their respective agencies. A request was made by Mr Johnson at 2.17 pm via radio to Mr Pickford to consider moving the ICV to a position where telephone communications were

<sup>146</sup> T 42.

<sup>147</sup> T 222.

<sup>148</sup> T 222 – 223.

<sup>149</sup> T 81.

<sup>150</sup> T 122 – 124.

<sup>151</sup> T 296.



available. Mr Pickford responded that this was not a possibility as there were limited sites available but they would consider doing so once the incident control became stable.<sup>152</sup> Mr Turner explained at the inquest that he identified a problem with the fax terminator, which was not working that day, and he believed this was the reason why they could not get any internet or telephone communications at the ICV. Changing locations would not have rectified this problem.<sup>153</sup>

93. As part of his new duties as sector commander Mr Freebury had taken his colleague, Mr Pino Hau, with him to have a look at the sector and consider available options. Mr Freebury drove into Sector Alpha and spoke to the previous sector commander, who was told he could return to the ICV for a meal break. Mr Freebury continued into the sector and came across the crews of Kalgan 3.4, South Coast 3.4 and HD 155. He told them he was going to look at options for containment and would come back and give them a briefing. He also told them a bulldozer would be coming through.<sup>154</sup>
94. Mr Wellstead recalls he and Mrs Bearfoot parked their truck on the south east corner of the pines and had lunch and waited for the bulldozer to arrive.<sup>155</sup>
95. At 2.23 pm Mr Gould contacted Mr Logan in order to provide an update of the fire situation. He confirmed that the City of Albany remained the controlling organisation and advised that the fire had escalated to a Level 2 incident due to the formation of a multi-agency IMT now that he had joined the IMT. The fire had also become more complex and was going to continue for some time, which also perhaps tipped into the lower end of a level 2 category.<sup>156</sup> They also discussed community alerts required.<sup>157</sup> Extra resources were requested from King River, Green Range and Many Peaks.<sup>158</sup>
96. Inspector Jennifer O'Connell, who was working with the WA Police in the Great Southern Region back in October 2012, was returning to Albany from Mt Barker with Inspector Morrissey when they noticed a large plume of smoke. Inspector O'Connell telephoned the Albany Police Station and was told about the Black Cat Creek Fire. She then tried to call Gary Turner at FESA for information but it went to message bank. At about 2.20 pm Inspector O'Connell and Inspector Morrissey went to the Albany FESA office and spoke with Gary Logan. Mr Logan advised that the fire was now a Level 2 incident and the City of Albany had

<sup>152</sup> Exhibit 1, Tab 2, p. 20.

<sup>153</sup> T 101.

<sup>154</sup> T 364 – 365, 508.

<sup>155</sup> T 508.

<sup>156</sup> T 219.

<sup>157</sup> T 221.

<sup>158</sup> Exhibit 1, Tab 2, p. 19.

requested FESA to assume control due to cost implications, but FESA did not agree to taking over as cost wasn't a trigger.<sup>159</sup>

97. Around this time Mr Pickford spoke to Mr Johnson and indicated that the fire was still running in a south easterly direction and remained uncontrolled and uncontained. Mr Johnson asked Mr Pickford who was in control of the fire and Mr Pickford responded that the Incident Controller remained the same with FESA supplying support and assistance. Mr Johnson appears to have misinterpreted this response and thought that FESA was in control of the fire.<sup>160</sup>
98. Just before 2.40 pm Mr Freebury returned to the control point. He asked Mr Hau to direct the bulldozer driver that was there to go on to the sector and start cleaning up the track while he went to the ICV and spoke to the IMT. Mr Freebury told the IMT members that from his recent review of the sector it was a viable option to tie the fire into the lake by burning off the tracks he had just inspected. The IMT endorsed this strategy.<sup>161</sup>
99. Mr Gould gave evidence he thought the strategy was reasonable and achievable, bearing in mind they believed the wind change would occur at or around 5.00 pm.<sup>162</sup> Mr Gould explained at the inquest that the plan did not involve backburning in the true sense, but the plan was to light wind-driven strips or spots back into the fire to lock the fire into that area and clean up unburnt vegetation near the track.<sup>163</sup> Mr Gould agreed that the timing of the wind change was important in this regard, as it gave a guide to the level of urgency needed to get that line established. Although Mr Gould acknowledged that they were not naïve enough to think that the wind change couldn't happen a bit earlier, their understanding of the forecast time of 5.00 pm gave them the impression they had some time to allow themselves to actually get the line established.<sup>164</sup> If they had known the forecast was that the wind could change at 3.00 pm, that would have made a difference to the viability of the plan.<sup>165</sup>
100. After getting approval from the IMT Mr Freebury then collected Mr Hau and left to go to Sector Alpha to implement the plan to create a burnt edge along the track.<sup>166</sup>

<sup>159</sup> T 131; Exhibit 1, Tab 28 [6].

<sup>160</sup> Exhibit 1, Tab 2, p. 20.

<sup>161</sup> T 366.

<sup>162</sup> T 210.

<sup>163</sup> T 210.

<sup>164</sup> T 211.

<sup>165</sup> T 212, 215, 401.

<sup>166</sup> T 221.

**IMPLEMENTATION OF PLAN ON SECTOR ALPHA**

101. At 2.45 pm Mr Freebury returned to Sector Alpha and provided a briefing to the crews that were already on the sector. These were 'South Coast 3.4' crewed by David Wettenhall and Ryan T'Hart, 'Kalgan 3.4' crewed by Darryl Bradley & Kevin Bransby and possibly some other crew, and the DEC HD 155 with Mr Wellstead and Mrs Bearfoot on board.<sup>167</sup> Based upon the IMT's understanding of the spot forecast, Mr Freebury told the crews that a south westerly change was forecast at around 5.00 pm, although he emphasised that it could come at any time so they needed to be aware of it and be careful.<sup>168</sup> He briefed the crews on the proposed strategy, which involved putting in some spot fires about 100 metres apart and sitting on them to watch what they did. Mr Freebury also told them where they could access water and what channel communications they were going to use on the sector.<sup>169</sup>
102. Mr Wettenhall had been working in Alpha sector most of the day and he clearly recalls that shortly before the briefing the wind was still north or north-west and had not shifted south. The fire was still a slow moving flank fire heading east at that stage and wasn't wind driven.<sup>170</sup> Mr Wettenhall and his partner had already conducted some reconnaissance of the east-west track and had been unable to locate alternate egress from the fire ground. Mr Wettenhall queried this with Mr Freebury, who confirmed that they would have to come back out the way they came in as the way ahead was blocked by swamp and sand dunes, at least until the bulldozer had been through.<sup>171</sup>
103. At the end of the briefing Mr Freebury asked the crew of Kalgan 3.4 to stay with the existing anchor point in the black and then asked South Coast 3.4 (Mr Wettenhall and Mr T'Hart) to come up 100 metres and put in a spot fire and sit on it and HD 155 (Mrs Bearfoot and Mr Wellstead) to come up 100 metres past them and put in another spot and sit on it.<sup>172</sup> The bulldozer then arrived and he asked the bulldozer driver to clean up the track.<sup>173</sup> Another two trucks, a King River 2.4 and a Highway 3.4, also arrived around this time and Mr Freebury asked them to start mopping up the sector from the southeast corner, putting out anything burning in preparation for the predicted wind change.<sup>174</sup>
104. Mr Freebury then left the crews and drove along the track that the bulldozer had commenced cleaning up. At that time he observed that the flank fire was still very mild, with one to one and a half metre

<sup>167</sup> T 368; Exhibit 1, Tab 2, pp. 22, 26.

<sup>168</sup> T 368; Exhibit 1, Tab 2, p. 21.

<sup>169</sup> Exhibit 1, Tab 2, p. 22.

<sup>170</sup> T 278 – 279, 508.

<sup>171</sup> T 368, 508; Exhibit 1, Tab 2, pp. 22, 26.

<sup>172</sup> Exhibit 1, Tab 2, p. 22.

<sup>173</sup> T 368.

<sup>174</sup> T 368 – 369.

flames, and there was no smoke to indicate a wind change.<sup>175</sup> Mr Freebury stopped about 350 metres east of the pines and called up South Coast 3.4 and asked them to come up 100 metres past the current fire edge and put a spot in and sit on it. He then called up HD 155 and asked them to come up 100 metres past the south coast truck and do the same.

105. Following Mr Freebury's instructions, Mr Wettenhall drove up and then lit two spot fires, one at the edge of the track and another about 15 metres in from the edge of the track. His plan was that the second fire would suck in the spot fire away from the edge and in towards the unburnt ground.<sup>176</sup> Mr Wellstead and Mrs Bearfoot went ahead of the brigade truck and put a spot in on the edge about 100 metres ahead of them. They then sat in the truck and watched it develop. It blew away from them and was going in from the edge, as expected.<sup>177</sup>
106. What the two fire crews didn't know was that at the time they were igniting the spot fires the wind had already commenced shifting from west-north-west to south-west, which then had serious consequences for those fire crews.<sup>178</sup> The timing of the wind change was particularly unfortunate, as there was evidence from Mr Freebury that if the wind had changed even five minutes later, in his opinion that might have provided sufficient time for the spot fires to have developed enough to provide burnt ground around the firefighters and provided them with some safety.<sup>179</sup>
107. In the meantime (sometime around 2.20 pm)<sup>180</sup> the further DEC resources from Walpole had arrived at the ICV, being two Heavy Duty tankers identified as 'Frankland 44' (crewed by Shaun McHenry and Charlene Hordyk<sup>181</sup>) and 'Frankland 40' (crewed by Matt Corlett and Jason Fletcher). They were provided with a briefing by Gary Turner.<sup>182</sup> Mr Fletcher and Mr Corlett couldn't recall exactly what they were told verbally about the weather forecast during the briefing, although when interviewed the day after the fire Mr Corlett thought they had been told there was a wind change predicted at possibly 4.00 pm. He was less sure of this at the inquest<sup>183</sup> Mr McHenry recalled they were provided with verbal information regarding a potential south west wind change at about 5.00 pm.<sup>184</sup> They were also shown an aerial photograph of the

<sup>175</sup> T 369.

<sup>176</sup> T 283 – 284.

<sup>177</sup> T 509 – 510; Exhibit 1, Tab 2, p. 25.

<sup>178</sup> Exhibit 1, Tab 2, p. 24.

<sup>179</sup> T 388 - 389.

<sup>180</sup> T 413.

<sup>181</sup> Charlene Hordyk is now called Charlene Dekker but I will continue to refer to her as Hordyk throughout the finding as that was her name at the time of events.

<sup>182</sup> T 413, 439, 447, 450.

<sup>183</sup> T 414, 433, 436, 444 - 445.

<sup>184</sup> T 451; Exhibit 1, Tab 2, p. 20.



fire on which Mr Turner marked out the burnt area with a felt pen, and they were told the radio channels to use.<sup>185</sup>

108. Mr Fletcher asked for a copy of the actual weather forecast and a map. Mr Fletcher initially recalled they were told that the IMT were short on maps and weather reports and he commented “that if we didn’t have that bit of information that we wouldn’t be going into the fireground.”<sup>186</sup> Mr Fletcher explained that this was standard procedure.<sup>187</sup> They were then given a copy of an aerial photograph map and a written weather forecast by Mr Gould.<sup>188</sup>
109. Mr Fletcher did not read the printed weather forecast, but Mr Corlett had a quick read of it as they walked back to the truck and he relayed the information to Mr Fletcher. The format of the spot forecast given to Mr Fletcher and Mr Corlett was unfamiliar to them, as it was apparently different to what they were used to, and the size of the fonts made it difficult for Mr Corlett to read. As a result, Mr Corlett focussed on the information in the table, which provided the temperature and winds at different times.<sup>189</sup> Mr Corlett demonstrated at the inquest that at the time he was doing so, he was most likely holding the forecast in such a way as to put his thumb over the additional written information, below the table, about the significant wind change.<sup>190</sup> Therefore, in reading the written forecast, Mr Corlett made the same oversight as Mr Johnson. At the time it was read out to him, Mr Fletcher thought what Mr Corlett read out generally matched what they had been told verbally during the briefing, which given the same error was made, is unsurprising.<sup>191</sup>
110. Mr McHenry also gave evidence that he looked at the written forecast and noted it was in a different structure with a different table to what he was used to seeing. He read the top of the document to check the date and other details were correct and then looked at the table but didn’t look further down to the information written about the significant wind change. He explained that in the past that sort of information was not put there in the format he was used to reading. Again, the information he read matched what he had been told at the verbal briefing, so he was satisfied.<sup>192</sup>
111. Frankland 40 (Matt Corlett and Jason Fletcher) then led the way onto the fire ground with Frankland 44 (Shaun McHenry and Charlene Hordyk) following behind them. They were intending to liaise with the sector commander, who some of the witnesses believe they were told

<sup>185</sup> T 453 - 454.

<sup>186</sup> T 413.

<sup>187</sup> T 422.

<sup>188</sup> T 414, 433, 451 - 452.

<sup>189</sup> T 435.

<sup>190</sup> T 422 - 423.

<sup>191</sup> T 414, 435.

<sup>192</sup> T 452, 468.

was a person called Gary Treeby from Forest Productions Commission,<sup>193</sup> rather than Mr Freebury from DEC who was the actual sector commander. It also seems they were given directions into Sector Alpha and shown the area on the map, but were mistakenly told it was Sector Bravo at the time, which suggests there was some confusion in the instructions being given out to arriving crews.<sup>194</sup>

112. As Mr McHenry drove east along the track he stopped to relieve himself and asked Ms Hordyk to check the weather forecast. She agreed that it seemed to match what they had been told at the briefing. It appears Ms Hordyk also missed the portion below the table referring to the possible earlier significant wind change, although she didn't have a good recollection of what she read at the time.<sup>195</sup> The other Frankland truck overtook them, so they followed them into the fireground.
113. As they continued onto the fire ground Mr McHenry observed that the vegetation in the area was coastal heath and banksia woodlands, which he knew were a fairly volatile fuel type that could make the fire behaviour unpredictable. He was also concerned about the fuel age.<sup>196</sup> He shared this information with Ms Hordyk, who was significantly less experienced in firefighting than Mr McHenry. Mr McHenry had been engaged in firefighting since he was 12 years old.<sup>197</sup>
114. Mr McHenry tried unsuccessfully to call Gary Treeby from FPC over the radio and then as they continued on he noticed they were leaving burnt ground to the south. Mr McHenry told Ms Hordyk that they were leaving the black, which was their safety zone, and noted that the area they were heading into was very dense with a huge amount of fuel. They didn't have their pumps on at this stage as they were still anticipating that they were going to be involved in prescribed burning only. They soon passed the volunteer bushfire brigade truck SouthCoast 3.4, with Mr Wettenhall and Mr THart on board. They waved as they passed them. They noticed Mr Wettenhall had his camera out at that time, and they could see the two spot fires the two men had lit. Mr McHenry could also see some another fire along a fence line and Mr Wellstead and Mrs Bearfoot's spot fire ahead. Mr McHenry became concerned about the three different types of lighting he could see being conducted, so he stopped his truck, intending to speak to the other DEC fire crews about implementing a better plan.<sup>198</sup>
115. As the Walpole crews had been making their way onto the fireground Mr Freebury spoke to Mr Hilder back at the DEC Albany office and then received a radio transmission from Kalgan 3.4 to say that the fire

<sup>193</sup> T 414, 451, 456.

<sup>194</sup> T 414 – 415, 426, 451.

<sup>195</sup> T 452, 455, 469 – 470, 492.

<sup>196</sup> T 477.

<sup>197</sup> T 451, 456 - 457.

<sup>198</sup> T 460, 477

behaviour “had picked up a bit.”<sup>199</sup> Mr Freebury explained that when he stopped to speak to Mr Hilder at around 3.00 pm, he was located just past the crest of the hill facing east, so he had no vision of what was coming up behind and had no vision of the change in fire behaviour on the other side of the crest.<sup>200</sup>

116. Mr Freebury turned his utility around, so that he was heading west. He intended to drive back west to catch up with the Kalgan truck and check on the fire behaviour. The point where he turned around was in close proximity to where HD 155 had parked and Mr Wellstead and Mrs Bearfoot were minding a spot fire. Mr Freebury started to drive west but had not moved far when he was approached by the Walpole DEC crews in their Heavy Duty tankers.
117. The Walpole crews had seen Mr Freebury and Mr Hau, who they knew well and had worked with before at fires.<sup>201</sup> Frankland 40 drove past Mr Freebury’s vehicle and pulled over to the north side of the track in front of Mrs Bearfoot and Mr Wellstead’s vehicle, HD155. Mr McHenry had already pulled in his vehicle, Frankland 44, behind HD155 and directly opposite where Mr Freebury’s ute stopped. The diagram below shows the approximate placement of the vehicles along the track at this time:

*Exhibit 1, Tab 2, P. 28 – Depicts the approximate layout of relevant fire suppression resources in the period immediately preceding the burnover.*

118. All of the vehicles except for Mr Freebury’s were facing east, away from the burnt ground. Mr Freebury described the positioning of the trucks at that moment as creating “a bit of a truck jam,”<sup>202</sup> which then

<sup>199</sup> T 370.

<sup>200</sup> T 386.

<sup>201</sup> T 416.

<sup>202</sup> T 399.

affected the escape options available to the fire trucks as the fire hit the track.<sup>203</sup>

### **THE WIND CHANGE**

119. The Australian Fire Authorities Council defines a ‘burnover’ as “a section of fire that overruns personnel and/or equipment.” This phenomenon often occurs as a result of a significant wind change causing a flank fire (perimeter parallel to the main spread of fire) to rapidly develop into a head fire.<sup>204</sup> The events described in the next section fit that description closely.
120. As noted earlier in this finding, there was a misapprehension amongst most of the personnel on the fire ground that the predicted wind change would occur around 5.00 pm. Although it was generally understood that the wind change could occur earlier, it was not expected by most people that it would begin two hours earlier than what they thought was the forecast time.<sup>205</sup>
121. As mentioned earlier, a communication had come through from Mr Nissen, a Bushfire Brigade member not involved in the fire and designated ‘Bornholm One,’ that he had experienced a wind shift about an hour before the burnover. Mr Johnson communicated seeing a similar change where he was located in Milpara, but it then shifted back again shortly afterwards.<sup>206</sup> Mr Pickford recalls that he recommended to the IMT that this information be transmitted to all personnel on the fire ground and it seems at least some of the fire crews were aware of it.<sup>207</sup>
122. Information from the Bureau of Meteorology wind observations at Albany Airport reveals the wind did begin to change in that area at about 2.19 pm, when the prevailing winds began shifting from NNW to WNW. This shift in wind represented the start of the ‘significant wind change’ as forecast by the Bureau in the spot weather forecast for that day.<sup>208</sup> From 2.44 pm to 2.48 pm (so within a four minute period) the wind was then recorded to shift abruptly to the SW.<sup>209</sup>
123. At around this time Mr Gould had travelled a few kilometres by car from the ICV to get telephone coverage. He contacted Mr Logan to advise that the fire in the pine plantation appeared contained and they were working to consolidate Sector Alpha but there was potential for the fire to run out to the coast. At that time the size of the fire was

<sup>203</sup> T 399 - 400.

<sup>204</sup> Exhibit 1, Tab 2, p. 25.

<sup>205</sup> T 250.

<sup>206</sup> T 258 - 259.

<sup>207</sup> Exhibit 1, Tab 2, p. 42.

<sup>208</sup> Exhibit 1, Tab 2, p. 42.

<sup>209</sup> Exhibit 1, Tab 2, p. 42.



estimated at 500 hectares.<sup>210</sup> Mr Gould estimated that the wind at his location at that time was from the south-west at 10 to 15 kilometres per hour, but it was fluctuating quite a bit and he was making his assessment visually as he had no weather instruments to hand. He thought it was an indicator that the wind might be beginning to change, but was not alarmed at that stage. He could see the fire from where he was situated and there was no indication that there was any wind change at the fire itself. The fire was still streaming to the southeast and the smoke was heading strongly in the same direction. Mr Gould then returned to the ICV but before he could mention anything to the other IMT members about what he had seen of a possible wind change beginning, the events of the burnover occurred.<sup>211</sup>

124. It is also worth noting that when Mr Fletcher later returned to the control point, he observed the wind was quite calm at that location and it gave no indication of the strength of the wind on the fireground in Sector Alpha.<sup>212</sup>
125. It is notable that none of the usual cues that fire crews would use on the fire ground to detect a wind change seem to have been observable on this occasion. The usual indicators such as smoke, dust swirling and wind tree movement were not present to provide a warning, even though the fire crews were looking for them.<sup>213</sup> A photo later provided by the Bureau of Meteorology showed the smoke in two layers, one heading in one direction and one in the other direction, indicating there were two winds, one high and one low, which made it confusing to read the signs.<sup>214</sup>
126. Mr Wellstead gave evidence that the only sign that the wind might be changing was that it appeared to be dropping off in intensity. At the time it did not appear significant to him, but in hindsight he thinks it should have alerted him that something was going to happen and that the change was coming in. However, they were in shelter behind the pines, which were blocking a lot of the winds, which he thinks may have caused him to not make the connection.<sup>215</sup>
127. As they were lacking the usual warning signs, when the wind suddenly changed and pushed the fire towards them, even the experienced fire fighters were caught off guard.<sup>216</sup> Mr McHenry described the suddenness of the wind change as like “turning on a switch, turning on a light.”<sup>217</sup>

<sup>210</sup> Exhibit 1, Tab 2, p. 22 – 23.

<sup>211</sup> T 223 – 224, 248 – 250, 261.

<sup>212</sup> T 427.

<sup>213</sup> T 406 – 409, 446.

<sup>214</sup> T 118.

<sup>215</sup> T 508 - 509.

<sup>216</sup> T 425, 438.

<sup>217</sup> T 477.

128. Allowing for a time delay from Albany, the abrupt SW wind change reached the fire ground at approximately 3.02 pm and within four minutes (so by 3.06 pm) the fire trucks and their crews were impacted.
129. The change that was forecast in the table at 5.00 pm was a west-south-west wind at about 18 kilometres per hour. Mr Fletcher's evidence was that the wind change he witnessed at 3.00 pm was more from a south-west direction and at a much greater speed, in the vicinity of 50 kilometres per hour. The difference in the wind direction, which was a 180 degree turn from the previous wind direction, had a significant effect on the fire, given the topography and location of the fire in comparison to their location.<sup>218</sup> The fire was travelling up a ridge in heavy unburnt vegetation, which meant its velocity was greatly increased, resulting in a fire of enormous intensity that was akin to an explosion as it reached the firefighters.

## **THE BURNOVER**

### **South Coast 3.4 – Wettenhall & T'Hart**

130. As indicated above, the first crew along the track in Sector Alpha was South Coast 3.4 with Mr Wettenhall and Mr T'Hart on board. They had just finished lighting two spot fires at around 3.00 pm. Initially the fire behaved the way Mr Wettenhall expected, burning in a south-easterly direction into the unburnt ground.<sup>219</sup> Shortly afterwards, Mr Wettenhall walked down the track approximately 20 metres from the fire break and suddenly observed flame heights of "up to 8 metres approximately 100 metres south" of the spot, burning up the slope towards the crews.<sup>220</sup> It was apparent to Mr Wettenhall that the fire behaviour had escalated and it was going to make it harder for them to defend the fire break, but he didn't initially realise how serious the situation had become.<sup>221</sup>
131. Mr Wettenhall and Mr T'Hart prepared themselves to defend the fire break but as they watched the main fire roar up the slope and hop the break they realised almost immediately that the break was lost. At this stage Mr Wettenhall estimates the flame heights had reached 10 metres under the influence of a swirling 20-kilometre per hour south-westerly wind. They tried to protect themselves from the heat with fog sprays but the pumps did not put out enough water to provide adequate protection. By this time they were surrounded by fire and in immediate danger. Mr Wettenhall and Mr T'Hart agreed to flee in the truck. Mr Wettenhall jumped in the driver's seat and they drove forward in an easterly direction, believing it was safer to drive forward than to reverse

<sup>218</sup> T 426 – 427, 438.

<sup>219</sup> T 285.

<sup>220</sup> T 286; Exhibit 1, Tab 2, p. 23.

<sup>221</sup> T 287.

into the fire. Mr T'Hart called a warning over the radio to the effect of "Stop, Stop, Stop. We have a burnover,"<sup>222</sup> which was heard by Mr Findlay at the ICV.

132. Mr Wettenhall drove the truck forward through the heavy smoke and flames in limited visibility, simply hoping they would not hit an obstacle. After about 100 metres they passed the two DEC Heavy Duty fire trucks that were engulfed in flames. They couldn't see anybody inside the burning trucks through the windscreens and it was too dangerous for them to stop. They didn't realise it, but at that stage their own truck was also on fire. They eventually came out to where the bulldozer was working. I will describe the further events involving South Coast 3.4 later in the finding.

### **DEC Fast Attack Utility – Freebury and Hau**

133. When Mr McHenry and Ms Hordyk had pulled up, Mr Freebury got out of his vehicle to speak to them. On walking towards the southern (driver's) side of Mr McHenry's vehicle (Frankland 44) Mr Freebury felt extreme heat and saw that there was smoke starting to drift across the track. He initially thought, "Okay, the edge is standing up a bit, you know, it happens" and moved towards the passenger side of the vehicle but then he realised that the heat had intensified and saw flames everywhere. Mr Freebury suddenly realised the fire had intensified dramatically and was upon them. This was the first indication to Mr Freebury that a wind change had occurred.
134. Initially, Mr Freebury expected this might mean there would be some hop overs as a result, but he didn't anticipate the inferno that then engulfed them. He ran to his utility, got inside and wound up his window. The vehicle's engine was still running at this stage and Mr Hau commented that he should "keep the revs up," so Mr Freebury kept his foot on the accelerator. Looking out of the vehicle Mr Freebury could see fire everywhere and the paint was peeling off the bonnet of their vehicle. He made a call on the radio and then Mr Hau told him to get them out of there, so instinctively Mr Freebury started driving west towards the anchor point or safe zone. He was driving so fast that Mr Hau had to tell him to slow down for safety. They quickly passed through the flames and into thick smoke, which limited their visibility to little more than the bonnet of their vehicle, and obscured their vision completely of South Coast 3.4 although they must have passed each other. In hindsight, they were fortunate not to have collided with each other.<sup>223</sup>
135. On reaching the anchor point Mr Freebury and Mr Hau came across the Kalgan 3.4 truck, which only had one crew member at this stage

<sup>222</sup> T 289.

<sup>223</sup> T 373, 376.

still on it as the others had evacuated. The remaining crew member was in shock.<sup>224</sup> Mr Freebury and Mr Hau checked he was okay and then told him to return to the control point. At this time Mr Freebury and Mr Hau made the brave decision to turn their own vehicle around and return into the fire, as they had realised the other fire trucks were not coming behind them.<sup>225</sup> They first had to put out some debris that was on fire in the back of the utility and Mr Freebury made a call over the radio to the ICV, then they headed back east.<sup>226</sup>

### **HD155 – Mrs Bearfoot & Mr Wellstead Frankland 44 – Mr McHenry & Ms Hordyk**

136. At the same time Mr Freebury ran to his utility Mr McHenry moved his heavy duty vehicle forward towards HD155, intending to try to block Mr Freebury's vehicle from the fire and give him an opportunity to get out. At that time Mr McHenry estimates the flames were eight to nine metres in height.
137. Mr Wellstead, who was driving HD155 with Mrs Bearfoot in the passenger seat, also observed the sudden escalation of the fire and realised they were in a burnover situation. He tried to formulate a plan as to what they should do. He was reluctant to go forward as he knew there was no road out and there was unburnt fuel ahead. He was also concerned about trying to turn around as the ground ahead was sandy, which would make turning around a slow process while in the fire's path. Mr Wellstead then looked behind and saw that there was a hole in the fire near the back of his truck, which he attributed to the spot fire being drawn back into the main fire. On seeing this he went to reverse his truck to put the cab of the truck in that space and hopefully save them. Mr Wellstead put the truck into reverse and started reversing but as he looked in the mirror he saw another truck right behind him. This was the first time he was aware of the Frankland 44 truck being there.<sup>227</sup>
138. After seeing the truck behind him, Mr Wellstead decided he had no option but to drive east through the fire and try to get ahead of the fire, then turn around and come back through it. He put the truck into forward and let out the clutch but the plan was thwarted when the engine of the truck stopped suddenly. All of the electronics also went off, leading Mr Wellstead to believe there was a total power failure.<sup>228</sup>
139. As Mr McHenry moved his Frankland 44 truck further forward he saw the brake lights of HD 155 ahead of him, which caused him to slam on his brakes and his truck engine then also died. At that point all of the

<sup>224</sup> T 373.

<sup>225</sup> T 371 – 373.

<sup>226</sup> T 374.

<sup>227</sup> T 511 – 512.

<sup>228</sup> T 512.



electricians in the truck still worked so Mr McHenry tried to restart the truck but he couldn't get the engine to respond.

140. Both Frankland 44 and HD 155 were now trapped in the midst of a burnover.
141. Ms Hordyk reached for the fire blanket in the pocket above her head then realised that in the Heavy Duty truck there was no such pocket. Mr McHenry noticed a huge amount of heat behind his head and he told Ms Hordyk to get her fire gear that was behind her in a bag, which she was already reaching for in her search for a fire blanket. As Ms Hordyk reached for the bag it ignited. Mr McHenry told her to get down so she sought shelter in the footwell. Mr McHenry also tried to, but he couldn't fit given his size and the steering wheel. Mr McHenry wasn't wearing his 'frog suit' at the time, but was wearing the regulation cotton clothing specified by the DEC, along with fire boots. His helmet and gloves were on the dashboard. Mr McHenry gave evidence that he wasn't wearing the full 'frog suit' at that time as he had previously been advised not to wear it during the day because the fact that it was green made it difficult to be seen against vegetation.<sup>229</sup> Mr McHenry knew his frog suit jacket was on top in the back so he reached behind and grabbed it and threw it to Ms Hordyk. At about the same time the actual fire front had burnt over them.<sup>230</sup>
142. They lost a window from the cab of the truck at this stage and the fire was sucked into the truck and everything caught fire. Mr McHenry grabbed two of his helmets from the dashboard and tried to shove them into the windows but they melted. A Kevlar fire hat only lasted a few seconds longer. Mr McHenry described in vivid detail at the inquest how at that stage everything inside the cab just started melting and burning and chemicals were being released into the air from burning plastics and exploding aerosol cans. Mr McHenry was unable to breathe and it was so hot that his glasses melted on his face and he had to throw them off.<sup>231</sup>
143. Mr McHenry could see the other fire truck ahead of him, the back of which did not look as impacted as their truck (as it was in the hole created by the spotfire).
144. With the window gone from their cab Mr McHenry knew that they would die if they remained inside the cab. Although he was aware that leaving the truck was not a good survival tactic, in the circumstances he thought it was the only option. Once he noticed that the actual fire flame had passed Mr McHenry tapped Ms Hordyk on the back and told her they had to go. Mr McHenry got the door open and told Ms Hordyk to follow him, with the plan to seek refuge in the cab of the truck

<sup>229</sup> T 456 – 457.

<sup>230</sup> T 462, 493 – 494.

<sup>231</sup> T 463.

ahead. At this stage, neither Mr McHenry nor Ms Hordyk were wearing their frog suit, gloves or a helmet.<sup>232</sup>

145. They got out of the truck and Ms Hordyk held onto Mr McHenry's shirt while he led the way towards the other fire truck. It was hot and visibility was poor, with everything burning around them. All they could hear was the roar of the fire. As they reached the cab of the other truck the door came open and Mr Wellstead basically fell out. Mr McHenry stood Mr Wellstead up, looked inside the cabin of the truck and saw both doors were open and the cabin was filled with smoke and he then realised that the other fire truck was in the same dire situation as theirs.<sup>233</sup>
146. Once the engine of HD155 had died, Mr Wellstead had considered his options. Although HD155's fire suppression pump was set up and running, it could only be activated to deploy a water curtain from the control panel at the rear of the vehicle. Mr Wellstead believed the conditions outside the vehicle cabin would not be survivable, so leaving the vehicle to turn on the water curtain was not an option. Mr Wellstead tried making a radio call for assistance, but no response was received. Mr Wellstead told Mrs Bearfoot to get her fire blanket out, but she was unable to retrieve it. Mr Wellstead reached behind the seat and retrieved both blankets and handed one to Mrs Bearfoot before they both took refuge under the blankets on the cabin floor. This was consistent with their training, which had taught them they should use the protection of the vehicle and take shelter as low as possible under fire blankets and wait for the fire to pass and conditions to ease outside the vehicle.<sup>234</sup>
147. At this stage Mr Wellstead had on his full protective suit but not his helmet or gloves, as they were sitting on the dashboard. Mr Wellstead was unable to say with certainty what Mrs Bearfoot was wearing at this stage and I am unable to reach any conclusion as the evidence is conflicting in this regard.<sup>235</sup>
148. While sheltering in the truck Mr Wellstead could hear things burning and crackling around them. He heard the air conditioning unit blow up and a pane of glass shatter, but it did not fall. He looked out and saw the truck was well and truly burning and the fire outside had passed to a large extent. Mr Wellstead realised that the protection of the truck cabin was diminishing rapidly and remaining inside was no longer feasible. Mr Wellstead decided that in order to survive they would have to evacuate and he thought their better option would be to just drop to the ground and put the blankets over them. Mr Wellstead yelled out to Mrs Bearfoot that it was time to go but before he could say anything to

<sup>232</sup> T 463, 495.

<sup>233</sup> T 463 – 464.

<sup>234</sup> T 513 - 514.

<sup>235</sup> T 514.

her about which way to go, she appears to have thrown her door open and bolted. Mr Wellstead has no idea whether she took her fire blanket with her as she fled.<sup>236</sup>

149. Mr Wellstead then went to open his own door, but as noted above, Mr McHenry and Ms Hordyk arrived at his door just at that moment. When Mr McHenry had reached the driver's side of HD155 he knocked on the door and Mr Wellstead came flying out the door and hit the ground. Mr Wellstead was relieved to find the air was cool enough to breathe as he had been struggling with the fumes inside the cab. Mr Wellstead then stood up and looked around for Mrs Bearfoot but he couldn't see her.<sup>237</sup>
150. At the same time Mr McHenry realised that the inside of HD155 was not habitable and made a decision that they should turn back to the safety point of the burnt ground. Although he recognised that they might not survive the walk, he thought "we're still alive at this stage, so we may as well keep going."<sup>238</sup> Mr McHenry grabbed Mr Wellstead, who appears to have thought Mr McHenry was trying to take his fire blanket so he resisted for a short time.<sup>239</sup> Mr McHenry then shoved Mr Wellstead and Ms Hordyk towards a spot where the bulldozer had gone through and had left a mound of dirt. As they passed the back of the truck Mr Wellstead looked for Mrs Bearfoot, thinking she may have moved to the back of the truck down her side, but she was not there.<sup>240</sup>
151. The trio moved to the mound and used the dirt to huddle against for a short time while things were flaring up again and getting hot. Around this time Ms Hordyk asked Mr Wellstead if she could please share his fire blanket and he then shared his fire blanket with her.<sup>241</sup>
152. They then set off again, with Ms Hordyk and Mr Wellstead huddled under the fire blanket and Mr McHenry guiding them. They were out of the fire by this stage but the air was still filled with smoke and very hot. Mr McHenry took a few steps forward and then as he turned back he felt something hit him in the back and push him over. Mr McHenry felt like he was on fire so he ran around and shoved his head between Ms Hordyk and Mr Wellstead under the fire blanket and put himself out. The fire blanket was not large enough for the three of them to shelter under it properly. Mr McHenry stood up a few seconds later and saw the headlights of Mr Freebury and Mr Hau who were making their way back into the fire looking for the missing crews. They saw them and stopped. Mr Freebury and Mr Hau gave them water bottles and Mr McHenry used the water in their water tank to douse himself.

<sup>236</sup> T 515 - 516; Exhibit 1, Tab 2, p. 30.

<sup>237</sup> T 515 - 517.

<sup>238</sup> T 464.

<sup>239</sup> T 516.

<sup>240</sup> T 517,

<sup>241</sup> T 495.

Mr Freebury then asked Mr McHenry whether he knew where Mrs Bearfoot was.<sup>242</sup>

153. Mrs Bearfoot had not been seen by any of the group at this stage since she had left the truck. Mr McHenry told Mr Freebury that he didn't know where Mrs Bearfoot was, and also said he thought that Mr Corlett and Mr Fletcher were dead as he had seen their truck in a big fireball.<sup>243</sup>
154. Mr Freebury and Mr Hau assisted Mr Wellstead and Ms Hordyk into the front of the Kalgan 3.4 brigade truck that was still in the vicinity and they then helped Mr McHenry onto the back of the truck. They then asked the driver of the Kalgan 3.4 truck to drive them to the control point, which he did although he was still in shock himself at that stage.<sup>244</sup>
155. Mr Freebury made another radio call to the control point to advise them there were three injured firefighters making their way to the control point who required medical attention.<sup>245</sup>
156. Mr Freebury and Mr Hau then once again made the brave decision to return into the fire ground to try to find the missing fire crew members. They drove approximately 100 metres east and came across the two burning DEC trucks. They continued on and about another 100 metres east of the trucks they came across Mrs Bearfoot on foot on the track in thick smoke. It was apparent that she was severely injured. They placed Mrs Bearfoot into their vehicle and Mr Hau managed to fit himself into the space behind the seats and they then evacuated. As they were coming out of the fire ground they came across Andrew Robertson from FPC. Mr Hau went with Mr Robertson back into the fire ground to look for the remaining missing crews and the bulldozer driver, while Mr Freebury took Mrs Bearfoot to the control point for medical treatment.<sup>246</sup>

### **Frankland 40, South Coast 3.4 and the Bulldozer**

157. Frankland 40 had travelled approximately 50 to 100 metres ahead of Frankland 44 and HD155 and stopped for only a few seconds when the burnover occurred. Mr Fletcher had just opened the passenger door, intending to go and speak to Mr Freebury, when everything suddenly intensified and they began to be hit by embers and large debris. There had been no indications from smoke or wind that the wind had changed so it took them entirely unawares. Mr Corlett immediately began to drive forward again but the head fire struck them and various

<sup>242</sup> T 374, 517.

<sup>243</sup> T 465.

<sup>244</sup> T 374, 465.

<sup>245</sup> T 374.

<sup>246</sup> T 376 377.

materials on their vehicle ignited, including the rear of the truck and side mirror. Mr Corlett accelerated heavily and they travelled further east down the track in an attempt to outrun the fire front. They reached a small clearing and observed a bulldozer working nearby. They proceeded down the track towards the bulldozer with Mr Corlett continuously beeping his horn to get the bulldozer driver's attention.<sup>247</sup>

158. The bulldozer seen by Mr Fletcher and Mr Corlett was driven by Laurence Fletcher, who I will refer to as the bulldozer driver to avoid confusion. The bulldozer driver had been asked to clear a fire break where the fire had already been, just in case the wind changed. The bulldozer driver drove to the eastern boundary and started clearing the fire break. On his way he had passed Mrs Bearfoot, who he had known for many years, and they waved at each other. At that time there was no fire around him and the wind was blowing mildly in a southerly direction.<sup>248</sup>
159. After clearing approximately 500 metres in total the bulldozer driver had noticed he was descending down a hill towards swamp area so he started backing up. At that time he saw the Frankland 40 fire truck coming down the hill towards him and could see the truck was on fire, with the driver's side door engulfed in flames. He put his bulldozer into third gear and drove straight down the hill towards the swamp, trying to clear the bush so the fire truck could get to the swamp. The bulldozer driver then turned and saw the fire truck bouncing left and right down the hill. As he came to an opening he turned the bulldozer to the right and saw the fire truck turn left. He then saw a male person get out of the truck through the driver's side door that was still on fire, and another male get out of the passenger side door.
160. The bulldozer driver steered his bulldozer to clear a path down the left side of the fire truck and as he was going to clear a path on the right side he saw the fire front, which was now on top of them. He used the bulldozer to push through about 10 large bushes that were fully on fire on the right side of the fire truck, pushing them towards the swamp.<sup>249</sup>
161. As noted above, South Coast 3.4, with Mr Wettenhall and Mr T'Hart on board, had also driven east when the fire struck. After driving past Frankland 44 and HD 155, South Coast 3.4 made its way down the track to where Frankland 40 and the bulldozer had sought refuge. As they arrived they were observed by the others to be on fire. Mr Corlett and Mr Fletcher sprayed the other truck to extinguish the fire as the pumps on South Coast 3.4 were no longer functioning.<sup>250</sup>

<sup>247</sup> T 416 – 417; Exhibit 1, Tab 2, p. 31.

<sup>248</sup> Exhibit 1, Tab 27.

<sup>249</sup> Exhibit 1, Tab 27 [34] – [35].

<sup>250</sup> T 291; Exhibit 1, Tab 2, p. 32.



162. At this stage all of them were engulfed in flames. The pictures below, taken by Jason Fletcher after he took refuge in the cab of the fire truck at approximately 3.11 pm, show the severity of the fire activity surrounding Frankland 40, South Coast 3.4 and the bulldozer, who continued to work around the fire trucks to keep them safe.<sup>251</sup>



*Exhibit 1, Tab 2, p.32 – Depicts fire activity surrounding ‘Frankland 40’ and ‘South Coast 3.4’ at approximately 1511hrs from the perspective of ‘Frankland 40’ (Courtesy: Jason Fletcher)*

163. All of the men remained down near the swamp for a while. Mr Corlett and Mr Fletcher then eventually decided to head back into the fireground to check on their colleagues. So after ensuring that the bulldozer driver and brigade volunteers were all right, they drove back west along the track. They came across Mr Hau and Mr Robertson on the way, who then sent a message back to Mr Freebury that the remaining crews and bulldozer driver were all safe. Mr Corlett and Mr Fletcher then passed the remaining two DEC HD trucks, which were still on fire and almost completely gutted.<sup>252</sup> They had been told by Mr Hau and Mr Robertson that their colleagues from Walpole DEC had been injured in the fire, so they made their way quickly back to the control point to see if they could help administer first aid.<sup>253</sup>

164. After delivering Mrs Bearfoot to the control point Mr Freebury had already begun driving back along the southern boundary of the sector to look for the missing crews. After receiving the call he came across Mr Corlett and Mr Fletcher in the south east corner of the pines and asked them to head back to the control point. He then caught up with the other trucks and asked them to return back to the control point.<sup>254</sup> When the remaining crew members arrived at the control point

<sup>251</sup> T 418 – 419.

<sup>252</sup> T 420.

<sup>253</sup> T 420 – 421.

<sup>254</sup> T 377.

Mrs Bearfoot and the others were still being given first aid.<sup>255</sup> The arriving men were also provided with first aid and support.

## Later events

165. Mr Findlay, as the incident controller, recalls at about 3.00 pm the wind changed dramatically to come from the south and at about the same time he heard over the Simplex radio channel, "Stop. Stop. Stop". Mr Turner recalled receiving a call at 3.10 pm saying "Assistance required."<sup>256</sup> They became aware there had been a burnover and people were hurt. An urgent radio communication from Mr Pickford to Mr Johnson was recorded sometime between 3.00 pm and 3.15 pm requesting he place St John Ambulance on standby for possible deployment to the location as he had been informed two tankers had been involved in a burnover.<sup>257</sup> Mr Turner began getting bottles of water and medical equipment from the ICV in preparation for providing first aid.<sup>258</sup> The injured personnel arrived at the ICV minutes later.<sup>259</sup>
166. All the witnesses agreed that the coordinated effort of all the people at the control point to provide first aid, comfort and support to the injured firefighters was exemplary and that everyone involved should be commended for their efforts.
167. After the injured personnel had been taken by ambulance to Albany Regional Hospital, Mr Pickford and Mr Gould drove to the burnover site to ensure no other personnel were in or around the sector.<sup>260</sup> Mr Findlay continued as the incident controller.<sup>261</sup>
168. At approximately 4.30 pm, as a result of the burnover, an interagency meeting was held between WA Police and the IMT. During the meeting strategies to contain the fire south of Two Peoples Bay Road, traffic management and critical infrastructure protection were discussed. John Tonkin, the FESA Area Manager, attended following a request from Mr Gould.<sup>262</sup>
169. At about 5.30 pm Mr Gould and representatives from DEC and the City of Albany had held a teleconference with senior staff at the FESA State Operations Centre. It was decided that as a result of the escalation of the incident and the injuries that had occurred that it was appropriate for FESA to take command of all operations. FESA then invoked s 13 of the *Bush Fires Act 1954* (WA) and took control of all operations in relation to the fire. Mr Tokin replaced Mr Freebury as Alpha sector

<sup>255</sup> Exhibit 1, Tab 27.

<sup>256</sup> T 105.

<sup>257</sup> Exhibit 1, Tab 2, p. 25.

<sup>258</sup> T 105.

<sup>259</sup> T 65.

<sup>260</sup> Exhibit 1, Tab 2, p. 37.

<sup>261</sup> T 65.

<sup>262</sup> T 65.

commander and Mr Gould replaced Mr Findlay as the incident controller.<sup>263</sup> At 6.15 pm the ICV was relocated 2.5 kilometres west to 132 Two Peoples Bay Road.<sup>264</sup>

170. The fire was eventually deemed controlled and contained at 9.00 am on Wednesday, 17 October 2012, at which time control of the Black Cat Creek Fire was handed back to the City of Albany.<sup>265</sup>
171. In total, FESA coordinated resources totalling 22 vehicles and 70 volunteers and staff from City of Albany Bushfire Brigades, 26 vehicles and 39 staff from DEC, 15 staff from FESA, six privately owned appliances and three heavy machinery contractors (bulldozers).

### **MEDICAL TREATMENT, CAUSE OF DEATH AND MANNER OF DEATH**

172. The St John of God Ambulance patient care record shows that a call was received at 3.21 pm and the ambulance arrived at the scene at 3.44 pm. On arrival Mrs Bearfoot was lying on the ground and being cooled with bottled water poured over her burns and receiving oxygen. Initial assessment showed Mrs Bearfoot was conscious and in severe pain. She was estimated to have partial to full thickness burns to approximately 80% of her body. She was administered oxygen via a mask and given fluid resuscitation and pain relief. Once stabilised, Mrs Bearfoot was taken by ambulance to Albany Regional Hospital, arriving at 4.25 pm.<sup>266</sup>
173. At the hospital Mrs Bearfoot was noted to have severe airway compromise and was placed on assisted ventilation. She was given further IV sedation, fluid resuscitation and pain relief. Her burns were dressed and she was kept as comfortable as possible until her transfer to Perth could be arranged. Mrs Bearfoot was transported by the Royal Flying Doctors Service to Royal Perth Hospital at 7.50 pm that evening and was admitted to RPH under the care of Burns specialists Dr Fiona Wood and Dr Suzanne Rae just before midnight. On their assessment the revised estimate was of partial and full thickness burns to approximately 60% of Mrs Bearfoot's body.<sup>267</sup>
174. Over the next period of nearly three weeks Mrs Bearfoot received an intensive level of medical treatment, including skin grafts, but by 29 October 2012 it was apparent that the skin grafts were not taking and there was evidence of sepsis, in spite of antibiotic treatment. Mrs Bearfoot's family were advised by her doctors that they did not

<sup>263</sup> T 150; Exhibit 1, Tab 2, p. 25.

<sup>264</sup> Exhibit 1, Tab 2, p. 37.

<sup>265</sup> Exhibit 1, Tab 2, p. 38.

<sup>266</sup> Exhibit 1, Tab 10.

<sup>267</sup> Exhibit 1, Tab 7 and Tab 11.

believe she would survive her injuries. A decision was made to continue her current management but not to escalate treatment. On 31 October 2012, as her health deteriorated further, palliative care was instituted. Mrs Bearfoot died just after midnight on 1 November 2012 with her husband by her side.<sup>268</sup>

175. There has been no criticism raised by any party about the medical care provided to Mrs Bearfoot. It is known that patients with severe thermal burns to more than 40% of their body are at significant risk of death even in highly specialised burn centres.<sup>269</sup> The evidence supports the conclusion Mrs Bearfoot received prompt and appropriate first aid by her colleagues, appropriate early initial resuscitation by paramedics and comprehensive resuscitation at Albany Hospital. This was followed by specialised burns care at RPH. Sadly, due to the extent of Mrs Bearfoot's injuries and the complication of sepsis, these intensive medical efforts were not enough to save her.
176. On 5 November 2012 the Chief Forensic Pathologist, Dr C T Cooke, performed a post mortem examination. The examination showed medical treatment for extensive thermal injuries (burns). At the conclusion of the examination Dr Cooke formed the opinion that the cause of death was multiple organ failure following thermal injuries.<sup>270</sup> I accept and adopt the conclusion of Dr Cooke as to the cause of death.
177. Given the circumstances in which the death occurred, I find that death occurred by way of accident.

### **INJURIES OF OTHER PERSONNEL**

178. Although this is an inquest into the death of Mrs Bearfoot, it should not be overlooked that several other people were also injured in the burnover.
179. Ms Hordyk sustained burns to her hands, forearms, elbows, thighs and a patch on the back of each calf and initially had problems with maintaining her airways. She was in hospital for three and a half weeks and was then on the burns outpatient program. She returned to work at DEC part-time on 28 December and then slowly built her way back up to full time work and remains working for the Department now. She agreed that she felt supported by the Department throughout her recuperation and return to work.<sup>271</sup>

<sup>268</sup> Exhibit 1, Tab 3, Tab 8, Tab 15 and Tab 13.

<sup>269</sup> Morbidity and survival probability in burn patients in modern burn care, Jeschke MG et al, 2015 April; 43(4): 808 – 15. <https://www.ncbi.nlm.nih.gov/pubmed/25559438>.

<sup>270</sup> Exhibit 1, Tab 5.

<sup>271</sup> T 496.

180. Mr McHenry sustained burns to his hands, forearms, elbows, knees, head, eyes and back.<sup>272</sup> After recovering from his injuries he received good support from various people at the DEC and is still working at the Department.<sup>273</sup>
181. Mr Wellstead sustained burns to his hands, elbows and legs. He spent a short time in hospital in Albany and then was treated as a burns outpatient at Royal Perth Hospital for several weeks. He has also returned to work.<sup>274</sup>
182. Mr T'Hart and Mr Wettenhall required treatment for smoke inhalation, as did a number of other fire crew.<sup>275</sup>
183. It was apparent from the evidence that all those involved also suffered shock and ongoing emotional trauma from the events.
184. Given the severity of the fire and the suddenness of events, it is fortunate that there were not more fatalities.

### **THE INVESTIGATION INTO THE FIRE**

185. Shortly before the burnover Inspector O'Connell and Inspector Morrissey from WA Police had driven to the ICV. Once there they spoke to Brent Findlay, who advised that no police involvement was required at that time and that there was a wind change expected at approximately 5.00 pm. This prompted the two police officers to go back and advise a property owner they had seen on the road of this information and the need for him to relocate. As they returned to the ICV they heard that four fire fighters had been injured. Inspector O'Connell was also advised that a witness had observed a suspicious vehicle in the area near the time of the fire starting, so Inspector O'Connell arranged for a forensic officer to assess the scene. She also directed police to set up road blocks at the intersection to Two Peoples Bay and Nanarup Roads. Later that day, Inspector O'Connell spoke to Detective Sergeant Troy Morris from the Arson Squad and requested that the Arson Squad commence an investigation into the possible suspicious nature of the fire.<sup>276</sup>
186. On Saturday, 13 October 2012 Acting Detective Senior Sergeant Gorton and Detective Sergeant Morris arrived in Albany to conduct a forensic fire scene examination. The purpose of the examination was to identify the origin and cause of the fire.<sup>277</sup> Various FESA and DEC staff assisted

<sup>272</sup> T 466.

<sup>273</sup> T 466.

<sup>274</sup> T 518 – 519.

<sup>275</sup> T 292.

<sup>276</sup> T 132 - 133.

<sup>277</sup> Exhibit 1, Tab 2, p. 45.



the police investigators. At the conclusion of the fire scene examination, the fire origin and cause was classified as undetermined.<sup>278</sup> Detective Sergeant Morris confirmed at the inquest that at the conclusion of the investigation no evidence was found that the fire had been deliberately lit, which suggested that the fire generated spontaneously.<sup>279</sup>

187. The investigation team also looked into the activities of the firefighters in lighting spotfires immediately prior to the burnover, and concluded that the choice may have been unwise given the proximity of the fire and the wind change forecast (if it had been widely known), but that the investigation team concluded this activity did not have any significant impact on the development or behaviour of the main fire.<sup>280</sup>
188. A comprehensive Investigation report was eventually prepared by Detective Sergeant Morris for the Coroner. I have relied heavily upon this report in the preparation of this finding, and I am grateful for Detective Sergeant Morris' diligence and thoroughness, which has made my task significantly easier.
189. Independent of the police investigation, FESA, DEC and the City of Albany retained Leading Edge Emergency Services to prepare a Major Incident Report into the Black Cat Creek Fire. The report was delivered on or around 24 October 2012. The report contained 10 recommendations for ways the three agencies could improve their response to, and management of fires.<sup>281</sup>
190. Worksafe WA also conducted an investigation into the incident. Following the investigation Worksafe issued a number of improvement notices to DEC and the City of Albany.<sup>282</sup>
191. Further, in February 2013 the City of Albany commissioned its own review of community safety conducted by Pam Dolly & Associates and completed on 30 April 2013. This report recommended further changes to the way the city structured its community safety and emergency services teams. Subsequent to that report the City of Albany initiated a program called the Leading Practice Program, which looked at ways to strengthen the relationship between the City of Albany and the volunteer bushfire brigades. A further report that provided recommendations for ways to achieve that aim was delivered on 30 April 2014.<sup>283</sup>
192. Dr Neil Burrows, works as a bushfire research scientist with Parks and Wildlife and previously with its predecessor agencies. Dr Burrows

<sup>278</sup> Exhibit 1, Tab 2, p. 45.

<sup>279</sup> T 18.

<sup>280</sup> Exhibit 1, Tab 2, p. 34.

<sup>281</sup> T 548 – 549.

<sup>282</sup> T 549; Exhibit 6, Tab 17.

<sup>283</sup> T 550 - 552.

became engaged after the incident as part of the reviews of the fire. He explained there are two aspects to such a review. The first is looking at what the fire did. The second is looking at how people responded to the fire, in the sense of how they tried to control or put out the fire. Dr Burrows is involved in the first part, namely looking at what the fire did by using forensic techniques and also speaking to the people who were involved to reconstruct the fire and determine how it behaved. He prepared a report titled, "Reconstruction of the path and behaviour of the Black Cat Creek fire," completed in March 2013.<sup>284</sup>

193. Dr Burrows' investigation found strong evidence that the fire started out of the rubbish tip on the private property at around 9.00 am when the wind was largely north-westerly. The fire probably had been smouldering for a few days after it had been used by the residents to dispose of rubbish, and on this morning the winds fanned the smouldering debris, causing it to ignite and the flames eventually spread as they were blown by the wind.<sup>285</sup>
194. The fire's behaviour was originally relatively mild, consistent with the firefighters observations, and then as it started burning uphill with the wind behind it its behaviour increased significantly. The head fire was under a relatively constant north-west wind and pushing towards the coast but with the flank fires still burning outwards. The winds shifted west north-west around 2.00 pm, at which time the eastern flank increased in activity but as part of a gradual process. Then at 3.02 pm the sea breeze came in to the fireground, shifting the wind south-west fairly quickly and turning the fire around. The sea breeze came in under the north-west wind, which is part of the reason why the firefighters on the ground were unable to detect the wind change as the smoke was being pulled up and taken back by the north-west winds above. That is why the firefighters did not see the smoke until the fire was very close. By 3.06 pm, four minutes later, the fire had burnt over the two fire trucks, so it all occurred very rapidly.<sup>286</sup>
195. Dr Burrows explained that a significant contributing factor to the speed of events was because the fire travelled towards the firefighters through long unburnt vegetation, that was 50 plus years old. The vegetation comprised mainly shrub land but where the turnover occurred it was low open Jarrah forest, approximately 10 to 15 metres high, with lots of sheoak (*Allocasuarina*) scattered throughout. The sheoaks are notoriously flammable vegetation. The fuel structure, therefore, was highly flammable and the fuel loads were very high, which Dr Burrows described as "probably the worst possible fuel scenario."<sup>287</sup> So when the winds shifted and the fire hit that vegetation the fire behaviour escalated dramatically not just because of the speed of the winds but

<sup>284</sup> T 651; Exhibit 3, Tab 2.

<sup>285</sup> T 651 – 653.

<sup>286</sup> T 653 - 656.

<sup>287</sup> T 656.

also because of the change in fuel type. The fact that the fire was running up a six degree slope, with the firefighters in the burnover caught at the top of the ridge, was also relevant. The fire behaviour where the firefighters were caught would have exhibited flames 20 metres or more high and perhaps 10 to 15 metres deep.

196. As Dr Burrows put it, the two DEC trucks ended up in probably the worst location at the worst time, which resulted in them being subject to a relatively short burst of extreme fire behaviour. Not long after the fire crossed the ridge where the firefighters were, the wind speed dropped off and the fire behaviour abated, but that was no help to the firefighters already caught in the burnover.<sup>288</sup>
197. In terms of the destructive power or ‘killing power’ of the fire at the moment it hit the firefighters on the ridge, Dr Burrows indicated the flame temperatures would have been in excess of 1000 degrees and the total energy release, measured in kilowatts per metre, was in the range of 23,000 kilowatts of heat energy per one metre of fireline, which would have made it an “[e]xtremely dangerous hostile environment.”<sup>289</sup> Dr Burrows explained that there is no firetruck built to withstand those sorts of intensities. In his opinion, even if the trucks had been equipped with more protective equipment, it would not necessarily have guaranteed the protection of the firefighters because of the severe intensity of this fire as it came up that hill.<sup>290</sup> The only advantages of the additional protective equipment such as deluge systems and fire shields, is that it might have bought them a little bit more time that they could have stayed in the cab of the truck, which it is agreed is the safer place to be in such a situation.<sup>291</sup>
198. As Dr Burrows explained, even after the initial flame front has gone through, it remains an incredibly hostile environment as everything is red hot and smouldering. The ground is seeringly hot and the air is incredibly smoky. Therefore, it is still a dangerous place to be even minutes after the main flash has gone through on a fire of that intensity.<sup>292</sup>
199. Dr Burrows expressed the view that the fire behaviour itself was not that surprising, once all the elements that contributed to it were considered, but it was still surprising that it happened so early in the fire season.<sup>293</sup>
200. Dr Burrows was emphatic in his opinion that the behaviour of this fire, in half a century’s worth of unburnt fuel load, supports a prescribed

<sup>288</sup> T 657.

<sup>289</sup> T 659.

<sup>290</sup> T 659.

<sup>291</sup> T 659 – 660.

<sup>292</sup> T 660.

<sup>293</sup> T 661.

burning program. If the bush had been burnt even six or seven years previously, Dr Burrows was pretty confident that the firefighters would have survived the burnover because the fire would have taken much longer to get to them and its overall behaviour would have been diminished, giving them more time to react or, if they were unable to escape, the conditions would have been such that the trucks would probably have coped better.<sup>294</sup> Mr Wellstead and Mrs Bearfoot's truck is a good example of this, as the rear of the truck that was protected by where the spot fire had burnt fuel, showing the difference a reduced fuel load could have made.<sup>295</sup>



*Exhibit 6, Tab 18, Fig. 1 – Depicts burnt out firetruck of 'HD155' after burnover*

## **PUBLIC SAFETY ISSUES ARISING FROM THE BLACK CAT CREEK FIRE**

201. As noted at the start of this finding, there were various topics or issues raised by counsel assisting<sup>296</sup> that were the focus of evidence during the inquest. They raised questions of public safety connected with Mrs Bearfoot's death, including topics such as the placement of Mrs Bearfoot and her colleagues in the 'dead man zone' and whether firefighters were appropriately trained. As was apparent during the inquest, many of these issues have already been addressed as a result

<sup>294</sup> T 662.

<sup>295</sup> T 662.

<sup>296</sup> T 12 – 13.

of the various reviews and the Worksafe investigation process. I have grouped them under headings and addressed them individually below.

## **Fire Appliances**

202. What happened during the burnover revealed two major issues with the vehicles occupied by Mrs Bearfoot, Mr Wellstead, Mr McHenry and Ms Hordyk. The first was the failure of the engines of both vehicles, leaving them stranded in the path of the fire. The second was the inability to withstand the fire during the burnover and provide a safe haven for the fire crews.
203. In relation to the first issue, a forensic vehicle examination was conducted by Senior Constable Stephen Wells and Vehicle Investigator Lee Buckley of the WA Police Vehicle Investigation Unit in an attempt to determine why the fire appliances HD155 and Frankland 44 came to a stop in the moments preceding the burnover.<sup>297</sup> All electronic 'data' stored on the computer equipment on the vehicles was destroyed by fire and heat so the investigators were unable to ascertain whether a computerized electrical component fault resulted in the inability to start/run the engines.<sup>298</sup>
204. On initial inspection of both vehicles, it was ascertained that the rear drive axle brakes were found applied/locked due to air loss from the system as the various flexible hoses and nylon valve components had melted or burnt. Failure of any of these systems may have prevented the vehicles from starting/moving.<sup>299</sup>
205. In relation to the second issues, the vehicle examiners observed that other than some rear fire/heat shield fitments, both vehicles did not appear to have been designed to withstand direct fire and heat contact.<sup>300</sup>
206. The vehicles that failed were both Isuzu FSS 550 (4 x 4) diesel powered single cab chassis and are equipped according to specifications set by the DEC for use as firefighting appliances at that time. Detective Sergeant Morris reviewed the specification and noted that it revealed extremely limited heat or burnover protection in the vehicles with the exception of fuel lines and the rear park brake flexible air line. Failure to implement appropriate thermal shielding to critical components of the vehicles was identified by Senior Constable Wells in the vehicle inspection.<sup>301</sup>

<sup>297</sup> Exhibit 1, Tab 2, p. 48.

<sup>298</sup> Exhibit 1, Tab 2, p. 48.

<sup>299</sup> Exhibit 1, Tab 2, p. 48.

<sup>300</sup> Exhibit 1, Tab 2, p. 48.

<sup>301</sup> Exhibit 1, Ta 2, p. 55.



207. The vehicles each had 'Marauder' sprays, which are spray nozzles affixed to either side of the platform and at the rear of the vehicle. Once activated, they yield a 'curtain' of water which can provide a cooling barrier against radiant heat and direct flame as a head fire passes over the vehicle. However, the spray system is also used by personnel during fire suppression activities with varying attachments and must be manually changed to the burnover protection system and activated from a control panel either at the rear of the vehicle or on the platform behind the cabin. It can apparently be activated relatively quickly by appropriately trained personnel, but still requires some action to be taken. Importantly, there was no method for activating this system from the security of inside the cabin.<sup>302</sup> In this case, this meant there was no opportunity for the crew members to activate it, given they were already inside the cabins of their trucks when the fire suddenly struck.
208. Detective Sergeant Morris commented that, from his investigation, it appeared that in Western Australia (as compared to other Australian jurisdictions) there has been a dependence on personal protective equipment and training and procedures to manage risk to personnel, rather than on improving the safety of the fire appliances.<sup>303</sup>
209. In contrast, Detective Sergeant Morris' investigation found that in the eastern states, as a result of testing commissioned in 2003, significant improvements were implemented to New South Wales, South Australian and Victorian rural fire appliances.
210. Some of the safety features implemented by the South Australian Country Fire Service, for example are:
- Radiant heat shields (internal cabin and external crew work platform);
  - Dedicated cabin deluge spray protection system;
  - 'In cabin' activation of the deluge spray system;
  - Tyre protection sprays;
  - Personal protective fire blankets (no national standard to date);
  - In cab breathing systems (unique to CFS appliances to date);
  - Critical component heat shielding, including brake and air lines;
  - Replacement of plastic exterior panels with metal panels where the panels may compromise access or egress to the cabin or the integrity of the vehicle;
  - Training in the operation of burnover protection equipment.<sup>304</sup>

These are just some examples of the kinds of protection systems that can be installed.

<sup>302</sup> Exhibit 1, Ta 2, p. 55.

<sup>303</sup> Exhibit 1, Tab 2, p. 59.

<sup>304</sup> Exhibit 1, Tab 2, p. 60.

211. Mr Pickford, who has been extensively involved in firefighting in the eastern states, confirmed that many of these protective equipment items have been added to fire appliances and used for as long as 15 years in the eastern states, with the trucks having been progressively modified as a result of learning from overruns and firefighter deaths in the past that changes needed to be made. He noted that the other States have had a lot more overruns than Western Australia, which has provided them with a vast amount of experience on how to provide survival areas for fire crews.<sup>305</sup> Mr Pickford was able to confirm that burnovers have occurred in the eastern states since these extra protective features have been put in place and they have had a large number of near misses because those systems are now in place.<sup>306</sup> Mr Pickford was able to cite a very recent example, as only the day before Mr Pickford gave evidence a dual cab heavy tanker was confronted with a wildfire overrun in a bushfire in Cessnock, New South Wales. The truck caught alight, but the crew survived as the drop down heat shields stopped the radiant heat entering the cab of the truck and they were able to be picked up by another truck and were saved.<sup>307</sup>
212. Mr Pickford indicated that South Australia is probably the most advanced state, in that they are actually building a dedicated fire truck that is designed as part of the Australian Defence Force vehicle fleet. It has a complete oxygenated atmosphere and is sealed, providing a perfect atmosphere for firefighters.<sup>308</sup>
213. Mr Peter Dans, the Director of Regional and Fire Management Services for what is now Parks and Wildlife gave evidence that since this incident DEC, and then Parks and Wildlife, undertook a range of modifications to its 113 heavy firefighting trucks. Some modifications were in response to improvement notices issued by WorkSafe, namely:
- Radiant heat shielding curtains were fitted to all cab windows;
  - Water deluge spray systems were fitted to cab exterior and wheel arches/tyres; and
  - Fire blanket stowage systems were fitted inside the cab.<sup>309</sup>
214. The changes to the fire blankets was designed to avoid the difficulty faced by some of the firefighters in the Black Cat Creek Fire, when they didn't know where to look for the blankets due to variations in storage between different vehicles. Mr Dans also gave evidence staff are trained on how to access them.<sup>310</sup>

<sup>305</sup> T 635, 637 - 638.

<sup>306</sup> T 636.

<sup>307</sup> T 636 - 637.

<sup>308</sup> T 637.

<sup>309</sup> T 531 - 532; Exhibit 10.

<sup>310</sup> T 538.

215. Further modifications were implemented to maximise the resilience of the firefighting trucks. These modifications involved:
- Removal of flammable cab insulation;
  - Heat shielding fitted to critical wiring and air lines;
  - Replacement of plastic components on the cab; and
  - Replacement of plastic air intakes with a customised metal version.<sup>311</sup>
216. All the modifications were in place prior to the 2014/2015 southern bushfire season, so they were in place at the time of the inquest. Mr Dans also indicated that as old trucks are replaced (usually after 10 years of service), the new trucks purchased receive the same modifications to ensure the fleet remains consistent.<sup>312</sup> This is because the Department is limited to purchasing vehicles manufactured for the international market, so the modifications need to be done after purchase.<sup>313</sup>
217. In addition to the modifications to the fire trucks, radiant heat shielding was also recently installed in the DEC's fleet of approximately 75 Toyota Landcruisers that are routinely or occasionally involved in fire management duties.<sup>314</sup>
218. Mr Dans indicated that the only modification used in at least one other Australian jurisdiction, but not currently in Western Australian Parks and Wildlife trucks, is 'in-cab breathing' apparatus. Mr Dans gave evidence that there is no consensus on the usefulness of that apparatus at this stage. Apart from the possibility that this additional safety feature might be useful, Mr Dans' evidence was that he was confident we have Parks and Wildlife have the best trucks that they can supply to their staff.<sup>315</sup>
219. Mr Andrew Sharpe, the Chief Executive Officer of the City of Albany, advised the court that, similarly to DEC, in response to Worksafe improvement notices the City of Albany's entire fleet of fire vehicles were fitted with fire blankets, radiant heat shields and lagging to critical vehicle components, to allow electrical components to operate during the course of a burnover.
220. Mr Sharpe also advised that the City of Albany's vehicles were the first fleet in Western Australia to be fitted with the heat shields and fire blankets. At the time of the inquest the fleet comprised 31 DFES provided fire vehicles and 3 city owned fire vehicles. Of those provided by DFES, 19 are heavy duty trucks and at the time of the inquest 15 of

<sup>311</sup> T 531 – 532; Exhibit 10.

<sup>312</sup> T 531.

<sup>313</sup> T 536.

<sup>314</sup> Exhibit 10 [24].

<sup>315</sup> T 537.

those trucks were being fitted with deluge system and in-cab breathing apparatuses and the remaining four were scheduled for replacement within the next 12 months and the replacement vehicles would be fitted with the same extra safety features. Cost was cited by DFES as a significant factor in deciding not to retrofit older vehicles that are due for replacement.<sup>316</sup> The other type of appliances are fast attack vehicles, and these are considered unsuitable for the deluge modification.<sup>317</sup>

221. Some of the changes also came out of the Major Incident Review, which recommended that, as a minimum requirement, all vehicles entering the fire ground should be fitted with an accessible fire blanket, one per person in each vehicle, plus roll down in-cab radiant heat shields. This recommendation was supported in principle by each of the agencies.<sup>318</sup>
222. Evidence was given by Mr Lloyd Bailey, the Deputy Commissioner of Operations Command for DFES, that subsequently DFES engaged the services of an experienced safety professional to conduct and document a formal risk assessment of the DFES fire appliances used for operational purposes. The scope of the review included a review of the current vehicles used and a review of research and industry trends nationally and internationally. This review recommended the installation of crew protection measures in vehicles within the DFES and local government fleets. DFES was funded to install the full crew protection measures, including in-cab air, deluge systems and underbody vehicle protection for vehicles in extreme bushfire risk areas.
223. As noted above, the rollout has commenced and is well underway, with the City of Albany one of the early recipients of the changes. Going further afield from Albany, Mr Bailey gave evidence that the DFES turnover blanket project has been completed and blankets have been installed in all but some urban and specialist appliances and staff and volunteers have been trained in how to use the turnover blankets.<sup>319</sup> Radiant heat shields have been installed in a significant number of vehicles and deluge systems, in-cab air, lagging and fire-resistant panels are the next stage. That stage has been completed in Albany apart from four vehicles that are due to be replaced.<sup>320</sup>
224. Some criticism was raised in questioning of Mr Bailey in relation to the length of time it has taken DFES to implement these changes in the State's fire fleet. Mr Bailey explained at the inquest that installing the radiant heat shields, for example, has not been a simple process, as a lot of the shields had to be custom made and the vehicles are

<sup>316</sup> T 592.

<sup>317</sup> T 553 - 555.

<sup>318</sup> T 575.

<sup>319</sup> T 576.

<sup>320</sup> T 576 - 577.

distributed in approximately 750 locations across the State.<sup>321</sup> DFES did focus upon Albany initially immediately following the Black Cat Creek Fire, which is why the first stage was completed here quickly. Mr Bailey also explained the second stage required considerable research prior to implementation. Mr Bailey also spoke of how the entire contract procedure is a complex process, as it involves a number of contracts which are subject to the government processes for awarding those contracts.

225. The final stage, or final key phase of the improvements, is installing Automatic Vehicle Locators, a program that is still underway but that Mr Bailey indicated was progressing. AVL's had been installed in a number of vehicles already and it was intended the bulk of the fleet would be fitted by roughly the end of 2016. Certainly the City of Albany's vehicles were anticipated to all have had AVL's fitted by 12 December 2016.<sup>322</sup> Parks and Wildlife vehicles were already equipped with AVL's at the time of the fire.<sup>323</sup>
226. Mr Bailey indicated that DFES is attempting to reduce the number of types of vehicles in its fleet from 28 varieties to a smaller number, to make implementing further changes a simpler process in the future.<sup>324</sup>
227. I asked Mr Bailey whether he was aware of any of the equipment being tested in an incident. He indicated that there has been one near burnover just north of Perth where the radiant heat shields and fire blankets were deployed. In the end, the vehicle wasn't actually impacted by the fire, so it is difficult to say whether the new equipment will save a crew in a burnover similar to what occurred in the Black Cat Creek fire, but at least it indicates the equipment works and the crew was able to access and deploy them. The feedback from the firefighters involved was that the equipment was easy to use in the circumstances, which would have been a pressure situation.<sup>325</sup>
228. As noted earlier, Mr Pickford was able to cite recent examples of how the equipment had saved firefighters in the eastern states in a burnover situation, which lends weight to the importance of ensuring all fire fighters have access to the safest vehicles available. In that regard, I acknowledged at the inquest that DFES faces a difficult logistical problem given the scattered nature of the fire fleet across the State, and also a cost issue (as all government departments face) in ensuring that all vehicles are updated in a timely manner.

<sup>321</sup> T 582.

<sup>322</sup> T 584 – 585, 590, 593.

<sup>323</sup> T 116 – 117.

<sup>324</sup> T 592.

<sup>325</sup> T 593 – 594.



229. However I also acknowledge that there is no price that can be put on the safety of firefighters, who risk their lives for the greater good of the community. That includes paid staff and the many volunteers.
230. I commend Parks and Wildlife and DFES on their progress so far in ensuring that the fire appliances now used by firefighters in Western Australia are far safer than those available to Mrs Bearfoot and her colleagues during the Black Cat Creek Fire.
231. However, without making a formal recommendation, I also urge DFES (and the State Government as its funding provider) to prioritise the upgrading of all of the DFES fire appliances fleet (not just in Albany) on an urgent basis. The information provided by Mr Bailey on 7 November 2017 indicated that Stage 2 of the plan was still only at 38% of the fleet completed, and the remaining 62% were anticipated to be completed over the next two years.<sup>326</sup> Even acknowledging the validity of the many reasons given by Mr Bailey for the delays in fully implementing the changes, that is still a lengthy period of time given the death of Mrs Bearfoot occurred in 2012.
232. I also acknowledge the evidence of Dr Burrows that no vehicle would probably be able to withstand the extreme forces that were involved in the burnover on that day in October 2012, but there is no doubt that the protective safety features now being added will provide a much greater level of safety to firefighters in this State. Given those same protective features have been available to firefighters in some of the eastern states jurisdictions for many years, it is the minimum that this State's government should provide at this time.
233. An interesting point raised by Mr Pickford in this regard, and something that was raised by other witnesses, is the difficulty getting the right type of trucks manufactured that do not require significant modification after delivery. Mr Pickford attributed the problem to buying power. He observed that firefighters have agreed for many years that if all the states and territories across the country got together and decided on one brand of vehicle, there would be a good prospect of convincing the manufacturer to build a vehicle to a specific design and use less plastics and more metal and with better protective features.<sup>327</sup> Mr Pickford indicated that there is an organisation called AFAC, the Australasian Fire and Emergency Services Authorities Council, that includes most of the Australian States' firefighting authorities. It is clearly a matter that this council should at least consider, if they have not done so already, and I hope that the Commissioner of DFES will see fit to do his best to put this matter on the agenda for future discussion.<sup>328</sup>

<sup>326</sup> MFI 2.

<sup>327</sup> T 638.

<sup>328</sup> T 638 – 639.

## Personal Protective Equipment Clothing

234. Mr Dans indicated that in 2011 to 2012 the DEC Fire Operations Guidelines 2011 – 2012 (FOB73) outlined the minimal personal protective equipment (PPE) required for use by DEC personnel involved in fire operations/suppression. The guideline identified items including hard hats, smoke goggles, boots, gloves, shirts, trousers, 2-piece fire overalls (frog suit), undergarments and high visibility vests with details of their appropriateness for the fireground in different conditions.
235. Significantly, the guidelines indicated that cotton trousers and high visibility shirts issued by DEC were appropriate PPE as a minimum standard for personnel involved in fire operations. DEC senior management advised this minimum standard was instigated in order to manage fatigue of personnel, due to the construction of the frog suit. As a result, the cotton trousers and high visibility shirts were authorised to be worn during fire operations, although the frog suit was available if staff or the incident controller deemed a higher level of protection was required to minimise the risk of accident or injury.<sup>329</sup>
236. In addition, Mr McHenry gave evidence at the inquest that, he understood that wearing the full ‘frog suit’ wasn’t recommended as being green, it meant they blended in with the trees. Also, he indicated that their biggest concern is “dehydration, stress, heat stress, heatstroke.”<sup>330</sup> Wearing light shirts that can breathe allows them to sweat and cool down whereas the big, bulky suits don’t enable that to occur and as a result “[y]ou won’t be able to do the time on the line that you are required to do at some stages.”<sup>331</sup> However, he agreed that if there was warning of a fire coming through the full suit is good to provide layers for protection against radiant heat, which is “the big killer.”<sup>332</sup>
237. According to Detective Sergeant Morris, the evidence indicated that personnel entering the fire ground of the Black Cat Creek Fire wore a mixture of DEC issued PPE and non-protective clothing (such as jeans). Further, this practice was seen across the agencies, not only amongst DEC staff.<sup>333</sup>

<sup>329</sup> Exhibit 1, Tab 2, p. 50.

<sup>330</sup> T 475.

<sup>331</sup> T 476.

<sup>332</sup> T 476.

<sup>333</sup> Exhibit 1, Tab 2, p. 50.



*Exhibit 1, Tab 2, p. 50 – Fig. 25 and 26 – Depicts personal protective equipment issued to DEC personnel, shirt/trouser clothing standard (left), departmental two piece overall (right) (Courtesy: DEC)*

238. As I have noted earlier in this finding, the evidence is not entirely clear as to what Mrs Bearfoot was wearing at the time of the burnover. There is some footage of Mrs Bearfoot from a Golden West Network (GWN) media team who were on the fireground at an earlier stage in the fire. Mrs Bearfoot is seen wearing her helmet, gloves, a long sleeve top and green cotton pants.<sup>334</sup> Mr Wellstead gave evidence that Mrs Bearfoot had been wearing her ‘frog suit’ jacket but at one stage removed it to rescue an injured possum. Therefore, it was clear it was available to her on the fireground. Mrs Bearfoot’s husband also provided information to counsel assisting about Mrs Bearfoot’s usual practice to wear her PPE.
239. Mr Pickford, who was involved in removing Mrs Bearfoot’s clothing to assist in her medical treatment, gave evidence that he had a good memory of what she was wearing. He recalled she was wearing dark blue pants and an overcoat made out of cotton drill, but not her green ‘frog suit’ jacket or pants. She was wearing her fire-rated safety boots.<sup>335</sup> Mr Pickford was not, however, there the whole time from when Mrs Bearfoot was found, so her protective jacket could have been removed at an earlier stage. Therefore, as I noted earlier, I am not in a position to reach a conclusion as to the extent of the protective fire equipment worn by Mrs Bearfoot at the time of the burnover. In any event, I note that even if she had not been wearing her ‘frog suit’, this was in line with DEC guidelines and consistent with what some of the other DEC fire crews were wearing at that time.
240. In contrast, Mr Wellstead had worn his full PPE, including the ‘frog suit’, and he credited his protective suit with saving him from the level

<sup>334</sup> T 317.

<sup>335</sup> T 610 - 611.

of injury the others suffered. He observed that if he had been wearing his gloves that day, which he usually kept in his pocket but for some reason had left on the dashboard that day, then he believes he would have come out of the incident very lightly.<sup>336</sup> Mr Wellstead attributed his practice of wearing the full PPE to his previous experience as a volunteer firefighter and the habits he had learnt in that role.

241. That is consistent with Mr Wettenhall's conduct on the day, who as a volunteer bushfire brigade member had on full bushfire brigade PPE, including boots, fire retardant pants, a tunic with a high collar, a helmet with a dropdown flap at the back and heat shield and leather gloves. He agreed that, as a volunteer brigade member, "we are pretty conscientious about making sure that we're toggged up completely."<sup>337</sup>
242. Mr Dans gave evidence that there has been a significant shift in the types of PPE that the DEC now requires their staff to wear. Mr Dans explained that their priority was to have clothing that staff could put on in the morning, when they got dressed for work, do their majority of duties in while at work and, if required, also go to a fire. The new clothing requirements are set out in Standard Operating Procedure 73, annexed to Mr Dan's statement, and it indicates the various approved items of personal protective clothing and equipment and the acceptable combinations. Helmets and Boots must be worn and goggles and gloves need to be accessible. Tecasafe trousers and either a Tecasafe jacket or overshirt must also be worn on the fireground, with a preference indicated for the overshirt in warmer daytime periods.<sup>338</sup>
243. Mr Dans explained that, like the Proban frog suit, the Tecasafe fabric is not 'fire proof' but it is a fire retardant fabric so if a flame source is removed from the fabric it will self-extinguish.<sup>339</sup>
244. Mr Dans also emphasised that the vast majority of the firework done by Parks and Wildlife staff is mopping up around a fire or a prescribed burn perimeter, not standing and delivering in front of raging infernos. Parks and Wildlife staff may spend many days doing these tasks, so it is important that they have a very lightweight, very well ventilated fire management outfit.<sup>340</sup> That was the reasoning behind previously allowing DEC staff to wear normal cotton drill, because heat related injuries were far more prevalent than burn injuries in their firefighters.<sup>341</sup>
245. Mr Dans indicated that there appears to be an acceptance amongst Parks and Wildlife staff now that the regulation clothing must be worn.

<sup>336</sup> T 519.

<sup>337</sup> T 293.

<sup>338</sup> T 532, 534; Exhibit 10.

<sup>339</sup> T 534.

<sup>340</sup> T 534.

<sup>341</sup> T 534 – 535.

This came after some variations were made to the cut and style of the uniforms to try and meet the needs of the workforce. Mr Dans noted that staff are putting the clothing on in the morning and wearing it all day, which suggests it is serving the purpose that was intended, and people seem to be comfortable wearing it all day.<sup>342</sup>

246. As for the volunteer firefighters, Mr Sharpe from the City of Albany explained that back at the time of the Black Cat Creek Fire the brigades were responsible for the distribution of PPE. Following the various reviews after the fire, he indicated that changes were made to get a more consistent approach and there is now a centralised store handled by the City of Albany's staff to distribute PPE to volunteers. Any new volunteers undergo an induction to ensure how to apply and use their PPE, and there is a requirement that all brigade members and City of Albany employees must wear full PPE to attend a fire ground.<sup>343</sup>
247. None of the counsel who appeared before me submitted that there were any ongoing concerns about the PPE that I should address in my finding. I am satisfied that the changes that have been made, particularly to the DEC regulations, in relation to PPE are appropriate and a significant improvement on the previous practice. Whilst the wearing of full PPE in a situation such as a burnover might still not be enough to save someone, the experience of Mr Wellstead lends weight to the conclusion that it is an important safety measure that should not be underestimated.

### **The IMT and Agency responsibility for the fire**

248. One topic raised for consideration at the inquest was whether the level of experience of the incident controller was appropriate, given he was not AIIMS trained. Mr Findlay had 12 years' experience as a volunteer fire fighter and 3 years as a Deputy Fire Control Officer, but had qualified under the 'old suite' of training and had not received any AIIMS training.<sup>344</sup> That didn't preclude Mr Findlay from being the Incident Controller as he was being mentored and supported by other members of the IMT who were AIIMS trained, including Mr Pickford, an extremely experienced emergency management coordinator.<sup>345</sup>
249. Mr Pickford, who has extensive experience in managing fires on a very large scale, was asked whether he had any concerns about Mr Findlay's ability to perform the role of incident controller throughout the fire. Mr Pickford indicated that he did not. He thought that Mr Findlay was making decisions and taking the actions that should have been

<sup>342</sup> T 537 – 538.

<sup>343</sup> T 556 – 557.

<sup>344</sup> T 22.

<sup>345</sup> T 22 – 23; Exhibit 1, Tab 2, p. 49.



undertaken, such as sectorising the fire, and he had confidence in him as an officer.<sup>346</sup> Mr Gould expressed a similar view.

250. I have no doubt that in hindsight Mr Findlay wishes that this burden had been taken from him, as he clearly feels a weight of responsibility for the devastating events that occurred. However, there was no evidence before me that any individual decisions made by Mr Findlay were unsupported by other members of the IMT or were so contrary to what an experienced incident controller might have done that they should be the subject of adverse comment. The issues with the weather forecast were a global problem amongst the team and there was also evidence before me that, primarily, the weather fell within the planning officer's domain.

251. I indicated at the conclusion of the inquest that I was satisfied that, given the understanding of the level of complexity of the fire prior to the burnover, and acknowledging the importance of allowing local people to use their local knowledge as well as gain experience in managing fires, it was a reasonable decision to leave Mr Findlay as the incident controller.

252. I also note that within the IMT on the day there appears to have been some confusion over which agency had control of the fire, as well as the reasons why there was a decision by DEC and FESA not to take over control of the fire.

253. I have since been informed of the Operational Response Agreement between the City of Albany and DFES, which outlines the formal handover process and 'agreed trigger points' for transferring management of an incident from City of Albany and DFES under s 13(4) of the *Bushfires Act*:

- A major bushfire Level/Type 2/3;
- Multiple incidents Level/Type 1/2/3;
- Long duration incidents Level/Type 2/3;
- Serious injury and/or fatality;
- Community under threat;
- Major infrastructure threat/loss (life lines).<sup>347</sup>

Other than for Level 3 fires, the other triggers only prompt consideration of a discretionary decision as to whether to take over management. Further, even if another agency takes over management it does not automatically mean that the incident controller will change to a member of that agency.

<sup>346</sup> T 613 - 614.

<sup>347</sup> T 263; Exhibit 1, Tab 2, p. 49.

254. I'm also told that cost is not a trigger, and in any event the City of Albany (like any local government agency) has the ability to seek supplementary funding from DFES if required.
255. I tried to get some clarification from Mr Logan as to what disadvantage there would have been to FESA if it had agreed to the request from the City of Albany to take over management of the fire. It is still not entirely clear to me what the disadvantage would have been, if the evidence of Mr Logan is accepted that his refusal (or deferment) was not due to having limited staff resources.<sup>348</sup> However, it was also explained to me that even if FESA had acceded to the request, there would have been little difference, from a resource and decision-making point of view on the fireground, that would have changed.<sup>349</sup> Mr Logan attempted to explain that if they needed to access state resources outside the local area, then FESA could assist with that, although the IMT could also make requests from neighbouring local governments.<sup>350</sup> When I put it to Mr Logan again what would have changed if FESA had taken over when requested, he indicated that other than Mr Gould possibly becoming the incident controller (which Mr Gould suggested was not an automatic conclusion), nothing else would have changed as the local FESA office had no additional resources to provide at that time given the only other available staff were hours away.<sup>351</sup> Mr Gould also agreed it wouldn't have had any effect on how they operated at the time.<sup>352</sup>
256. Interestingly, there was a recommendation by the Major Incident Review that DFES or Parks and Wildlife should take control of all declared level 2 incidents but this wasn't supported by the various agencies. The present system remains that in the case of a Level 3 incident, it automatically falls under the control of the DFES Commissioner.<sup>353</sup> For lesser fires that are categorised as Level 1 or Level 2, the decision will depend upon the particular circumstances of each fire.<sup>354</sup>
257. The Major Incident Review also recommended that Western Australia adopt a culture of Joint Incident Management Teams. This was agreed in principle by the three agencies, and indeed already appeared to be a common practice.
258. On 2 April 2015 the City of Albany, in conjunction with DFES and Parks and Wildlife, adopted a new operational protocol titled the Greater Albany Zone Enhanced Bushfire Response Urban Interface. The operational protocols set out the responsibilities of each agency in responding to fires and maps out the response zones in the city.

<sup>348</sup> T 145 – 146.

<sup>349</sup> T 187.

<sup>350</sup> T 187.

<sup>351</sup> T 198.

<sup>352</sup> T 228, 237, 265.

<sup>353</sup> T 578.

<sup>354</sup> T 579.

According to Mr Sharpe from the City of Albany, the adoption of the operational protocols has formalised a close working relationship between the three agencies.<sup>355</sup>

259. The three agencies agree that where all three agencies are present on the fireground each needs to be represented in the IMT. That is what occurred in the Black Cat Creek Fire. I put to Mr Turner that some of the problems in the IMT appear to have arisen from a lack of communication between different groups on the day. Mr Turner agreed and indicated that the City of Albany are now in the practice of meeting with DFES and DPaW staff every Thursday to talk about the actual management of fires. In Mr Turner's view they have "moved forwards in leaps and bounds to remedy some of the problems of lack of communication between each organisation."<sup>356</sup> In Mr Turner's opinion the City of Albany staff have a very good working relationship with the local DFES and DPaW staff.<sup>357</sup>
260. I am satisfied that, at least in the Albany region, the individuals involved with the various agencies work cooperatively together and are doing their best to continually improve the working relationship between the three agencies to ensure fire management runs smoothly.<sup>358</sup>

### **Location of the ICV & communications generally**

261. I have referred to the van as the ICV (incident control van), although I note it has many names including the forward control vehicle, the operations van and the command post, which seem to be used interchangeably by witnesses.<sup>359</sup>
262. There was evidence about the difficulty faced by the IMT with placing the ICV in a position appropriately close to the fire ground to allow control of resources entering and exiting the area, while still being in a location that allowed for proper communications.
263. Mr Findlay, who was the incident controller, was aware that there were problems using telephones, but wasn't certain if it was due to his mobile service provider or more universal. They were using the '101' yellow radio on channel 34 and had a separate Simplex channel to communicate between the two sectors by radio, so they were comfortable that they could communicate by radio with the fire crews on the ground.<sup>360</sup> The main problem arose for the IMT members who had to leave the ICV and travel some distance to call external people.

<sup>355</sup> T 555 – 556.

<sup>356</sup> T 128.

<sup>357</sup> T 129.

<sup>358</sup> T 580.

<sup>359</sup> T 112.

<sup>360</sup> T 62 – 63.

264. Mr Johnson explained at the inquest that there was no mobile phone coverage from the ICV but if the van had been moved to obtain mobile phone coverage it would have had to have moved a considerable distance from the fire site, which might have affected the quality of the transmission on radio channels used on the fire ground.<sup>361</sup>
265. Mr Gould also emphasised that there were no difficulties with radio communication around the fire. He acknowledged there was a problem with communications externally but explained that in a lot of incidents the IMT has to operate independently of any outside assistance, so it is just a case of making adjustments in those cases. In this case, it required moving away from the ICV to try and make phone calls outside. In his case, Mr Gould was required under FESA rules to provide timely reports back to Mr Logan, so he did have to drive to another location to do that. However, Mr Gould did not believe that this requirement hampered the operational aspects on the fireground as all tactical decisions were being made by the IMT at the site.<sup>362</sup>
266. Mr Freebury described the communication problems as an “annoyance,”<sup>363</sup> as he had to keep leaving the fireground to report back to Mr Hilder, but it didn’t impact upon his duties significantly and didn’t make a great deal of difference on the fire line.<sup>364</sup> He also agreed that it wasn’t an unusual problem to experience when fighting fires in the area.<sup>365</sup>
267. Mr Turner identified the real problem with the communications was due to the failure of the fax terminator, rather than the location of the van, and that was not fixed even when they moved the ICV later in the evening.<sup>366</sup> Mr Turner had a practice of checking all the equipment in the van every Monday morning during the fire season and leading up to the fire season, to ensure everything is in ready condition for emergency service use, so he had checked it four days before. It was working then, but for some reason it had failed by the day of the fire.<sup>367</sup> According to Mr Turner the phone reception also improved only marginally when they later moved the ICV, as the area was a black spot for telecommunications, and it would have required moving the ICV “a fair distance down the track” to get better coverage.<sup>368</sup> Mr Turner pointed out that if the ICV had been located further away, it would have delayed first aid being provided to the firefighters and increased their suffering.<sup>369</sup>

<sup>361</sup> T 38.

<sup>362</sup> T 216 – 218.

<sup>363</sup> T 358.

<sup>364</sup> T 404.

<sup>365</sup> T 358.

<sup>366</sup> T 101, 110.

<sup>367</sup> T 111 - 112.

<sup>368</sup> T 111.

<sup>369</sup> T 106 – 107.

268. Mr Pickford's evidence was consistent with Mr Turner's that they were aware during the fire that the problem with communications was that the equipment in the van wasn't working and it wasn't feasible to move the incident control structure in the middle of a fire. Indeed, he offered the opinion that "it would have been dangerous to move the van in the middle of the rapidly-escalating situation."<sup>370</sup> He also agreed that in the end the close location of the ICV to the fireground was fortuitous as it meant that the injured firefighters were able to receive prompt first aid.<sup>371</sup>
269. Based upon all the evidence before me, I indicated at the conclusion of the inquest that I was satisfied it was a reasonable decision by the IMT not to move the position of the ICV during the main management of the fire, and the location later assisted in providing urgent first aid to the victims of the burnover, which would have reduced their suffering.
270. Mr Turner volunteered the information that the City of Albany was building a new van at the time of the inquest, which they were hoping to have in use before the end of 2016. The current ICV was a former Main Roads vehicle converted into an operations vehicle and used for the last 28 years. The plan was to purchase a new van prior to the next bushfire season, which was more suited to purpose.<sup>372</sup>
271. Government funding was not forthcoming to provide for the new communications van, so the City of Albany put forward \$50,000 to replace the existing communications van and additional community funding was then sourced through crowdfunding and sponsorship to more than double that figure and ensure that the new ICV, purchased in August 2016, would be able to facilitate best practice in the management of fires. The intention was that the new van would eliminate any black spot across the municipality and would allow greater communication on the fire ground. It was expected to be delivered a few weeks after the inquest hearing concluded.<sup>373</sup> That is clearly a positive step and should greatly improve services and, hopefully, avoid some of the problems experienced by the IMT during this incident.

## Spot Weather Forecast

272. The spot weather forecast has featured fairly prominently throughout this finding, as the failure of various personnel to interpret and disseminate all of the key information on the forecast played a key role in the DEC staff and other personnel being in the location where the burnover occurred at the time the wind changed. It was described by

<sup>370</sup> T 615.

<sup>371</sup> T 615.

<sup>372</sup> T 127 – 128.

<sup>373</sup> T 566 – 567.



Detective Sergeant Morris as a “critical failure,”<sup>374</sup> and I agree with his description. Although issues such as the ability of the fire appliances to withstand a burnover and the wearing of appropriate PPE obviously played a role in the injuries sustained by Mrs Bearfoot and her colleagues, it cannot be overstated that if they had known about the predicted wind change at 3.00 pm it is extremely unlikely they would have been in that location, entirely unsuspecting and unprepared, when the wind changed.

273. From the time that Mr Johnson omitted to read out the information about the significant wind change potentially occurring at 3.00 pm, the members of the IMT appear to have been working under the belief that the wind change was forecast to occur at about 5.00 pm. This belief was then perpetuated by briefings given by IMT members to fire ground personnel.
274. As noted by Detective Sergeant Morris in his report, this failure “bears a striking resemblance to the Boorabbin Fire”<sup>375</sup> that occurred in 2007 and during which three men died. Following a coronial investigation into those deaths the State Coroner found that, as in this case, the primary reason for the failure to pass on the important information about the timing of the wind change was due to human error in reading the BoM report rather than any procedural inadequacy.<sup>376</sup> However, the State Coroner also recommended that DEC (who was managing the fire) should take action to ensure that in future cases relevant weather forecast information, particularly information as to significant wind change, should be promptly transmitted to the IMT and from them to field personnel.<sup>377</sup>
275. Following the tragic events at Boorabbin DEC apparently updated their Fire Operations Guidelines in relation to weather forecasts, specifically identifying the importance of noting the significant wind change details, weather remarks and outlook in association with the tabulated forecast conditions, as these sections add significant value to the understanding of the forecast conditions.<sup>378</sup> Nevertheless, there was evidence at the inquest that a number of DEC staff, who understood the importance of receiving their own hard copy of the forecast, read the weather forecast and still missed the important wind information.
276. I am informed that subsequent to the Black Cat Creek Fire, the Bureau of Meteorology has of its own accord implemented a new format for the spot weather forecast. The significant wind change information is now highlighted above the tabulated data, in an effort to ensure that this

<sup>374</sup> Exhibit 1, Tab 2, p. 52.

<sup>375</sup> Exhibit 1, Tab 2, p. 52.

<sup>376</sup> *Record of Investigation into the deaths of Trevor George Murley, Lewis Kenneth Bedford and Robert Wayne Taylor*; Ref No 27/09, delivered 20 November 2009, p. 56.

<sup>377</sup> *Ibid.*

<sup>378</sup> Exhibit 1, Tab 2, pp. 52 – 53.

information is digested and considered in conjunction with the tabulated information.<sup>379</sup> Mr Bailey also advised that DFES discussed with the Bureau of Meteorology the addition of a blank table so that actual observed conditions could be recorded and transmitted back to the Bureau so they could validate and test the validity of the spot weather forecast they had issued.<sup>380</sup>

277. An example of the new format of the weather forecast is depicted below:

Example of a short term (12 hour) Spot Fire Forecast for Bold Park.

### Spot Fire Weather Forecast for Bold Park

Issued at 1:45 pm WST on Friday 11 November 2011

Incident Type: Wildfire (Level 2)	Website Form No: 1
Spot Forecast Location: Bold Park	Request No: 1
Latitude/Longitude: 31.958 115.77E	Fax number: 9321 2044
Elevation (ASL): 20 metres	Contact Ph: 9323 9333
Fuel Type: Grass	Contact Name: Jon Bloggs

**Observed conditions at Swanbourne AWS**

Local Time	Temp (C)	Dewpt (C)	RH (%)	Wind (km/h)		
				Dir	Speed	Gust
1330	41	5	11	N	30	40

Weather Forecast starting 1400 hours Friday 11 November 2011

Dry apart from the slight chance of a thunderstorm late this afternoon or evening. No significant rainfall expected, but lightning is possible. Moderate northwest winds will slowly turn westerly from late afternoon, then southwest during the evening and southerly overnight.

**Significant wind changes and uncertainties associated with the forecast**

The westerly wind change may slow and arrive later than suggested. The wind during the late afternoon/evening may become briefly stronger and quite gusty, with gusts of 80 km/h, especially if there are thunderstorms in the vicinity.

**12 Hour Forecast**

Local Time	Temp (C)	Dewpt (C)	RH (%)	Ceiling value (%): 90						
				10 m Wind (km/h)			1000 m AGL Wind (km/h)			GFD
				Dir	Speed	Gust	Dir	Speed		
1400	38	5	16	N-NW	30	40	NW	55	32	
1700	30	10	29	NW	25	35	NW	50	13	
2000	27	13	42	NW-W	20	30	NW	50	7	
2300	25	13	47	S-SW	20	30	NW-W	45	6	
0200	25	10	39	S	15	20	W-SW	35	4	

AGL - Above Ground Level, RH - Relative Humidity, Dir - Direction, Dewpt - Dew Point

**Outlook for Saturday**

Remaining dry and mostly sunny. Winds turning south to southeast at 10 to 15 km/h early Saturday morning then shifting south to southwest at 25 to 35 km/h early afternoon. Maximum temperature around 28C. Afternoon RH about 40%.

**Outlook for Sunday**

Remaining dry and mostly sunny. Winds turning east to southeast at 25 to 35 km/h early Sunday morning before shifting south to southwest at 30 to 40 km/h early afternoon. Maximum temperature around 32C. Afternoon RH about 30%.




Exhibit 1, Tab 2, p.53 – Depicts the new format ‘Spot Weather Forecast’ implemented by Bureau of Meteorology

278. Just from looking at the forecast as a layperson, it is apparent it is in a larger font that makes it easier to read, and the wind information is

<sup>379</sup> T 574.

<sup>380</sup> T 574.

highlighted much more prominently than in the past. Mr Johnson, was asked about the new format, and he agreed at the inquest that he definitely finds the new format clearer and easier to read.<sup>381</sup>

279. Since 2013, as part of the DEC training programme staff are trained in how to read the spot weather forecasts each year.<sup>382</sup>
280. Mr Bailey indicated that DFES also ensures that fire managers are trained to correctly interpret the new spot fire weather forecast and familiarise themselves with the entire format ensuring consideration of the whole forecast, not just the tabulated data.<sup>383</sup> DFES has also directed that such information should be communicated as a red flag warning, which is discussed further below.<sup>384</sup>
281. I am satisfied that the new forecast is much clearer and provides less opportunity for significant wind information to be overlooked. Coupled with more training of firefighters in how to read the forecast, it is to be hoped that what occurred in Boorabbin, and once again in Albany, will not be repeated again.

### **The ‘Dead Man Zone’**

282. The ‘dead man zone’ is the area directly around a bushfire that is likely to burn within 5 minutes and encompasses the distance the fire can travel in 5 minutes if the wind changes direction, turning a flank fire into a head fire.<sup>385</sup> While conducting fire suppression in the dead man zone, there is a risk that the fire intensity and spread can suddenly increase dramatically if the wind direction changes, leaving little or no time for firefighters to seek refuge before being enveloped in a burnover.
283. The general tenor of the evidence was that the safest place to be when conducting fire suppression duties is on burnt ground where the fuel load has already been consumed by the fire, well out of the dead man zone. Firefighters are trained to “bring the black with you”<sup>386</sup> or “to keep one foot in the black”<sup>387</sup> where possible.
284. However, evidence was also given that it is sometimes necessary to work away from the black, in what is called the dead man zone, to gain access to or effectively suppress a bushfire.
285. Mr Gould explained that firefighters work in the ‘dead man zone’ probably on every incident to some degree or another, but usually with

<sup>381</sup> T 41.

<sup>382</sup> T 533; Exhibit 10.

<sup>383</sup> T 573.

<sup>384</sup> T 574.

<sup>385</sup> T 530; “The Dead Man Zone” – CSIRO Project Vesta.

<sup>386</sup> Exhibit 1, Tab 2, p. 54.

<sup>387</sup> T 117.

enough proximity to burnt ground to ensure that the fire can't come around behind and surround them.<sup>388</sup>

286. Mr Peter Dans, the Director of Regional and Fire Management Services for DEC (and now DPaW), is responsible for coordinating the delivery of all services for the Department across the State.<sup>389</sup> He gave evidence that when possible firefighters should stay out of the dead man zone and work from burnt ground. However, the DEC fire management doctrine does not expressly prohibit working in the dead man zone, although it does reiterate the need for a higher degree of situational awareness and preparedness if required to do so.<sup>390</sup>
287. In his evidence at the inquest Mr Freebury expressed the view that an area tends to be called the "dead man zone" after something happens, but prior to then it's just a boundary on the fire that trained firefighters are used to going into and defending when required.<sup>391</sup> Mr Freebury explained that leaving the unburnt ground was sometimes necessary to mount an indirect attack, as he believed it was in this case, but it was a tactic he felt more comfortable initiating with trained DEC crew rather than brigade members who might not have the necessary experience and exposure.<sup>392</sup>
288. Mr Freebury explained at the inquest that the reason he didn't recommend they pursue a direct attack on the fire, where you start at an anchor point in the black and work around the fire, was because he didn't think it was a good option in this instance given the topography. Mr Freebury explained that at that time the fire flank was going to track into a swamp and there were obvious potential problems with appliances getting bogged and getting put into dangerous situations. He recommended an indirect attack, as was implemented, given the track was reasonably wide and it was thought there was time to tie it in to the large lake and dune system nearby. This plan was, of course, predicated on the belief the wind change was not going to occur for some time.<sup>393</sup>
289. However, as Detective Sergeant Morris pointed out in his report, the topography in the area also increased the risk to the firefighters if the wind did change, as being at the top of a ridge meant that there was even less time than normal to move if the wind changed, because the fire would run uphill. The gradient of the slope also hindered the crew's view of the approaching fire, greatly reducing the warning time indicating they needed to seek refuge from the approaching fire.<sup>394</sup>

<sup>388</sup> T 262.

<sup>389</sup> T 528.

<sup>390</sup> T 530.

<sup>391</sup> T 389 – 390.

<sup>392</sup> T 390.

<sup>393</sup> T 366 – 367.

<sup>394</sup> Exhibit 1, Tab 2, p. 54.

Much of this information comes from the expert report of Dr Burrows, and was not contested at the inquest.

290. DEC staff then, and now, are trained to address all of the necessary considerations to maximise safety when working away from burnt ground - LACES (Lookout Awareness Communications and Escape Routes and Safety Zones).<sup>395</sup>
291. There is evidence that Mr McHenry appreciated that they were adding a layer of risk when they left burnt ground and that the unburnt fuel also added risk. However he and Ms Hordyk had little opportunity to get any perspective on the other risk factors as the burnover happened so quickly after they reached the fireground. The same could be said for the other Frankland truck crew. Mr Wellstead and Mrs Bearfoot had spent much more time on the fireground that day, and had turned their minds to aspects of LACES such as the lack of an escape route east. Although they had left the safety of the burnt zone, their plan was to make their own safety zone by the lighting of the spot fires to create a line of burnt vegetation around them. As noted above, there was evidence that if they had had more time before the wind change, that plan would have worked.
292. However, as Dr Burrows explained, the coalescence of their location on the top of a ridge, the long unburnt fuel type and the timing of the wind change meant that they were all sitting in the worst place at the worst time when what had been a flank fire changed to a head fire and they were well and truly caught in the 'dead man zone'. The timing of the wind change was everything as if they had anticipated the wind would change at that time, training would have indicated that they should not be in that location at that time. Training in reading the spot weather forecasts, as discussed above, is therefore crucial.
293. The current DFES training programme also requires that firefighting staff are taught to understand that a wind change can quickly turn a flank fire into a head fire and crews must identify factors and plan for a safe and orderly withdrawal, if possible.<sup>396</sup>

### **Training of firefighters**

294. Survival training in preparation for a burnover incident was raised by numerous witnesses interviewed during the police investigation into the fire and identified as an area that could be significantly improved.<sup>397</sup>
295. Mr Wettenhall gave evidence that after this event his brigade now ensures that every year all the volunteers go through burnover exercises.<sup>398</sup>

<sup>395</sup> Exhibit 10.

<sup>396</sup> T 575.

<sup>397</sup> Exhibit 1, Tab 2, p. 55.



296. Mr Hilder also indicated that, while DEC had always provided some preseason training to crews (which would have included burnover situations) it was not mandatory and the format and content varied between districts.<sup>399</sup> Mr Dans gave evidence that since the Black Cat Creek Fire Parks and Wildfire now has a centrally coordinated training syllabus. The mandatory training addresses a number of Worksafe improvement notices that were issued and also relevant matters highlighted in the Major Incident Review. As far as practicable the current training is completed prior to 30 September each year and all Parks and Wildlife staff state-wide who go on to fire grounds participate in the training every year, so that there is 100% capture of staff. It is hoped by doing it prior to summer that all staff are retrained before people need to go onto a fireground for an early in the season bushfire.<sup>400</sup>

297. Mr Dans indicated the training package covers a range of themes, including:

- The wearing of PPE;
- Fire attendance;
- LACES;
- The dead man zone;
- Red flag warnings;
- Interpreting spot weather forecasts; and
- Fire blanket stowage, access and use during a burnover.<sup>401</sup>

298. The training also includes a scenario based drill of a simulated burnover situation.<sup>402</sup>

299. Mr Dans indicated there is now a requirement that all Parks and Wildlife staff have done a medical, a fitness test and the pre-season training to do with fire management prior to being rostered or deployed to anything to do with fire management. That is applied rigidly by managers throughout the State.<sup>403</sup>

300. Mr Sharpe from the City of Albany advised that in May 2015 the City of Albany created the position of a community emergency services manager (CESM), which is jointly funded by DFES. The role involves the coordination and presentation of the volunteer bushfire brigade training and also assisting DFES in maintaining volunteer bushfire brigade member lists as DFES maintains records of what training each

<sup>398</sup> T 293.

<sup>399</sup> T 532; Exhibit 10.

<sup>400</sup> T 532; Exhibit 10.

<sup>401</sup> T 532 – 533; Exhibit 10.

<sup>402</sup> T 533; Exhibit 10.

<sup>403</sup> T 535.

bushfire brigade members has completed.<sup>404</sup> There is now a minimum requirement for all new volunteer brigade members, which requires that they complete two courses that encompass aspects of AIIMS and utilisation of fire blankets in compliance with WorkSafe improvement notices and scenario based training before attending a fire zone. There is also the option to do additional training for those volunteers who elect to do so, which can lead to holding positions such as chief fire controller and deputy fire controller.<sup>405</sup>

301. A recommendation of the Major Incident Review was that critical operational procedures such as 'red flag warnings' needed to be adopted by all WA fire agencies. DFES adopted red flag warnings as a standard operating procedure prior to the Black Cat Creek Fire incident, but since the fire the Interagency Bushfire Committee agreed that the DFES standard operating procedure should be adopted across the various agencies. The red flag warnings are linked in with LACES.<sup>406</sup>

302. Mr Turner from the City of Albany gave evidence that the red flag warnings are part of the new training programme, and the weather forecast is something that must be given as a red flag warning.<sup>407</sup> Mr Turner described the training as having "moved forward with leaps and bounds"<sup>408</sup> to make sure that everyone knows exactly what they need to do on the fireground. He indicated that the City of Albany also puts a number of City of Albany employees and some volunteers through AIIMS Level 1 Incident Controller training, to add to the knowledge of those on the fireground.<sup>409</sup>

## CONCLUSION

303. It was apparent from conducting the inquest that several years on from the Black Cat Creek Fire, the events of 12 October 2012 are still keenly felt by members of the local community in the City of Albany. In addition to the many witnesses who attended to give evidence and the family of Mrs Bearfoot, sitting in the courtroom gallery each day were many others. The number of people in attendance demonstrated the level of community concern about what occurred and what this coronial investigation would find.

304. Mrs Bearfoot was obviously a popular longstanding employee of DEC and many of her colleagues were involved in the events that led up to her death. In addition, a number of them also sustained injuries from

<sup>404</sup> T 556, 561 - 563.

<sup>405</sup> T 558 - 560.

<sup>406</sup> T 572 - 573.

<sup>407</sup> T 124.

<sup>408</sup> T 126.

<sup>409</sup> T 127.

which they had to take time to recover. While only DEC staff were seriously physically harmed, the evidence of members of the other agencies involved in the fire suppression revealed they were also deeply affected by what happened to Mrs Bearfoot and her colleagues and many felt the weight of responsibility for what occurred.

305. When investigating how a reportable death occurred, it is rare to find one event or person's conduct is the sole contributor. It is more often a combination of circumstances, acts done and matters overlooked that together led to the death occurring. That is the case here. It arguably began when Mr Johnson overlooked the important wind change information on the spot forecast but there were many opportunities before 3.00 pm for others to identify that this information had been missed and take appropriate action. Further, decisions were made for fire crew personnel to be on unburnt ground lighting fires in a heavy fuel area and at the top of a ridge while not wearing full PPE when it was always acknowledged that wind changes could occur at any time and result in these personnel being in the 'dead man zone' (as eventually occurred). Even these events occurring on the day must be put in the context of broader decisions about vehicle protection systems and appropriate personal protective equipment that provided inadequate protection to the DEC personnel from the fire. Training for a burnover situation was also important and not done as comprehensively as it could have been.
306. Detective Sergeant Morris concluded at the end of his investigation for the coroner that the tragic death of Mrs Bearfoot highlighted the necessity for immediate improvements to the management of, and equipment utilised in, extinguishing bushfires in Western Australia. He pointed to the vehicle and personal protection systems in use in other states by rural fire fighting agencies as offering far superior security for fire fighters should they be trapped in a burnover incident, so guidance could be sought from those jurisdictions. In addition, Detective Sergeant Morris noted that even with the best equipment, fire suppression remains a treacherous occupation so rigorous reinforcement of training and continuous review of practices is still a necessity.<sup>410</sup>
307. The various agencies involved had all fully cooperated with the coronial investigation but they also instituted their own investigations, which were completed prior to the inquest. As noted previously, Worksafe also investigated. All three agencies involved have implemented changes and improvements, some as a result of Worksafe improvement notices and some of their own volition, well before this inquest commenced. As I have noted, DFES still has some way to go completing upgrades to all of the fire appliances in the state, but they have prioritised the fleet managed by the City of Albany given what occurred during the Black

<sup>410</sup> Exhibit 1, Tab 2, p. 63.

Cat Creek Fire, which hopefully gives some reassurance to the volunteer firefighters, although I note disturbingly that Mr Wettenhall, who was involved in the incident, still has access to a vehicle that has not been upgraded. I assume that must be one of the vehicles that is due to be soon replaced.

308. One theme of the various reports and witness accounts was the conspicuous bravery of some of the firefighters involved in the burnover that day. Mr Bailey's statement indicated that from a DFES perspective any recommendations for bravery awards have been completed, but it is not clear if any were made.<sup>411</sup> From my perspective, I think that anyone who voluntarily goes out to fight fires in the community, whether as part of their employment or as a volunteer, should be commended for their bravery. However, in this particular case I note that Mr Freebury, Mr Hau and Mr McHenry all put themselves in danger to try to help others, for which they should be particularly commended. As Ms Hordyk said about Mr McHenry, "I think it's terribly amazing that someone can behave like that,"<sup>412</sup> and I think the same can be said of all three men.
309. It should also not be overlooked that Wendy Bearfoot died on 1 November 2012 after bravely putting her own life in jeopardy to try to contain a fire that was threatening bushland and wildlife. Such duties were part of her employment, but it still requires bravery and commitment to the service of others to do what she did. Sadly, her efforts to help the community of Albany led to her death.
310. It was noted more than once during the inquest that there is an inherent risk in fighting fires that cannot be eliminated, particularly during a destructive wildfire. However, the changes implemented by the various agencies involved after the Black Cat Creek Fire tragedy are intended to allow fires to be responded to in a safer and more efficient manner than was the case at the time of the incident that caused the tragic death of Mrs Bearfoot.<sup>413</sup> I sincerely hope that this proves to be the case.

S H Linton  
Coroner  
12 June 2017

<sup>411</sup> T 581.

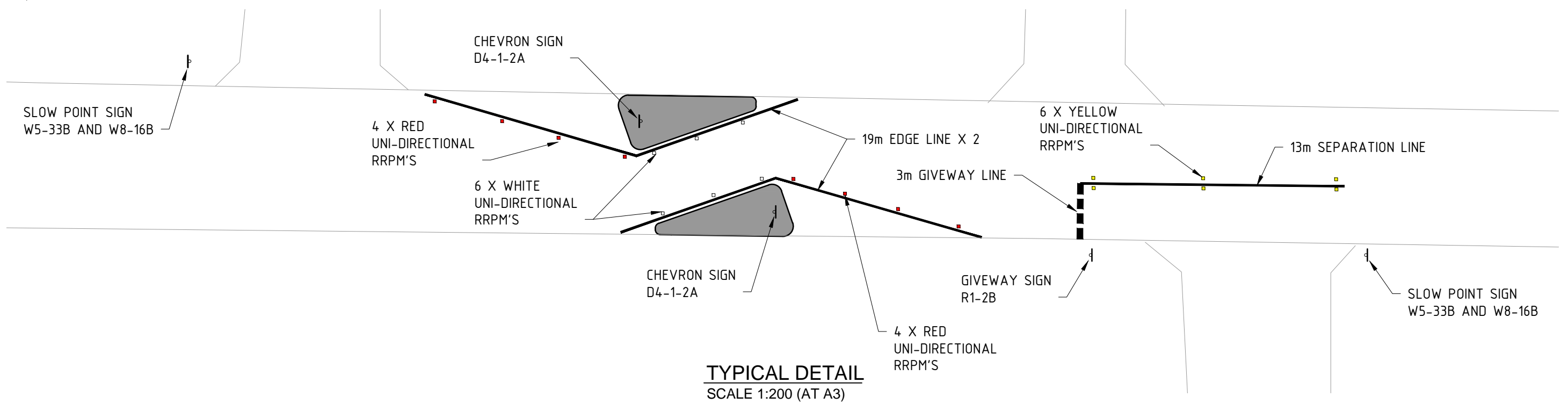
<sup>412</sup> T 497.

<sup>413</sup> T 568.



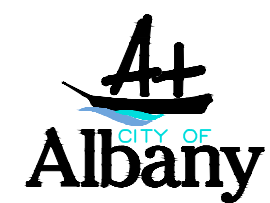


**LAYOUT PLAN**  
SCALE 1:2500 (AT A3)



**TYPICAL DETAIL**  
SCALE 1:200 (AT A3)

REV	DESCRIPTION	APPROVED	DATE



102 NORTH ROAD, YAKAMIA WA 6330  
PO BOX 484 ALBANY WA 6331  
Tel: (08) 9841 9333  
Fax: (08) 9841 4099  
Email: cityassets@albany.wa.gov.au  
Website: www.albany.wa.gov.au

**PRELIMINARY**

AUTHORISED	DESIGNED	DRAWN
	KS	KS
THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED		

PROJECT					
LOCAL AREA TRAFFIC MANAGEMENT BATHURST ST - NELSON ST - ONE WAY SLOW POINTS					
DRAWING NAME					
CONCEPT LAYOUT PLAN					
DRAWING No	FILE REF	JOB No	SCALE	SHEET No	REV
16085	RD.DEC.6	-	1:2500 @ A3	01	0