

# NATIONAL EMERGENCY

## RESPONSE

Official Journal of the Australian Institute of Emergency Services



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#### FRONT COVER

Photo by Craig Stehn.

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# NEW MEMBERS

The Australian Institute of Emergency Services is pleased to announce the following emergency services people joined the AIES between October and December 2016.

NAME	ORGANISATION	DIVISION
Damien Matcham	Ambulance Tasmania	TAS
John Brown	Fire and Rescue NSW	NSW
Peter McMahon	Aviation Rescue Services	VIC
Ian Hunt	Ambulance Victoria	VIC
Daniel Willoughby	NSW State Emergency Services	NSW
Scott Habgood	Fire & Rescue NSW	NSW
Jamie Daniluck	The University of Newcastle	NSW



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## BE A CONTRIBUTOR to *National Emergency Response*

Submissions now open for the Autumn edition of *National Emergency Response*.

We are looking for:

- Stories or articles
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Send your submission to [editor@aies.net.au](mailto:editor@aies.net.au) by Monday 6 February, 2017.

The best submission, as voted by the AIES National Council, receives a gold pen award at each year's Annual General Meeting.



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\*Both of these fees are tax deductible for people employed in an emergency management or counter disaster capacity.

Visit [www.aies.net.au](http://www.aies.net.au) to join, or to find out more. Find out more about AIES membership on page 26.



# FROM THE PRESIDENT'S DESK

Steve **Jenkins** MAIES

*National President*

2016 has drawn to a close. On behalf of the National Board and all state and territory divisional management committees, I hope that everyone had a happy and safe Christmas and New Year, and is looking forward to 2017.

Over the past 12 months, there have been a few changes within the AIES. In particular there was the departure of the previous NSW Division president from the National Board. As a result of the creation of a number of vacancies within the NSW Division Management Committee, I chaired the annual meeting of that division in Sydney on Friday 2 December 2016.

Many thanks to those who attended, and to others that submitted apologies and provided proxies. The meeting lasted approximately 45 minutes. Victorian President Rod Young was also in attendance and performed the role of minute-taker. Discussions at the meeting primarily centred around two main issues. Firstly, the managerial issues associated with the administration of the division over the past two years, and secondly, filling the casual vacancies that had been created on the management committee.

In relation to the first, it was acknowledged that the NSW Division Management Committee had done an extremely good job in organising and conducting the Emergency Management Resilience Conference in Sydney in May 2015. It was also highlighted that issues subsequent to that event had detracted from success of the event, and those associated with its conduct. I would like therefore to formally acknowledge the efforts of those involved in the preparation and conducting of the 2015 Emergency Management Resilience Conference. In particular, I would like to acknowledge NSW member Harold Wolpert for this outstanding contribution. I am aware that Harold personally, and through his company, contributed significantly to the success of the event. Harold has also been a member of the NSW Division Management

Committee and National Council, and I acknowledge his contribution to AIES in those roles also.

The second issue, filling the casual vacancies, resulted in the following members being elected onto the NSW Division Management Committee: Robert (Bob) Maul, Gordon Blair, Michael Crooksley, Graham Pretty and Peter Lang. I congratulate these gentlemen on their election to the NSW Management Committee, in particular, Bob Maul who has come



*On behalf of the AIES, we wish all emergency services personnel, and others who support them, safety in their operations as they perform their various roles in responding to and recovering from the various events that will occur.*

out of retirement to help out in the short-term. Nominations will be sought in due course for election to the NSW Division Management Committee at the division's general meeting in 2017. In the interim, the new committee will establish itself and manage the transition to the new financial management arrangements that all divisions are required to now follow, as set in place by the previous national treasurer.

Unfortunately I must also advise that the National Treasurer David Mack (South Australia), has recently advised his resignation from that role. David was instrumental in driving and implementing changes to the AIES' financial management practices. It is unfortunate that David is not continuing in this role to further progress these changes and initiatives, however, we are all volunteers and as such are all free to make our own decisions as to the role we perform within the Institute. I would like to thank David very much for his efforts and contribution to AIES over a period of many years, and I hope he will continue his involvement with AIES through the South Australia Division.

In November, the national registrar and myself attended the Katasztrófavédelem 2016 –

Nemzetközi Tudományos Konferencia (Disaster Management 2016 – International Scientific Conference) facilitated by the Institute of Disaster Management, National University of Public Service, Budapest, Hungary.

Peter and I co-presented a presentation entitled 'Good governance aspects of disaster management in Australia' (self-funded by Peter and I). Our presentation was very well received by the Hungarian delegates as well as those from other nationalities, particularly South Africa. I would like to thank Associate Professor Dr Agoston Restas and his colleagues from the University's Department of Fire Prevention and Rescue Control for their invitation and kind hospitality whilst we were in Budapest.

Bushfires and cyclones are set to make their annual presence felt around Australia again in the coming months. On behalf of the AIES, we wish all emergency services personnel (paid and volunteer), and others who support them, safety in their operations as they perform their various roles in responding to and recovering from the various events that will occur.

Here's wishing everyone a prosperous 2017. ●



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# 'LEW' LEWIS-HUGHES: MAN OF MANY CONTRIBUTIONS TO THE STATE EMERGENCY SERVICE

Joseph H Lewis-Hughes OBE 2/2/25 – 3/12/16

"Lew" as he was better known to many people sadly passed away on 3 December 2016. Below is Lew's story, written by Chas Keys a few years ago.

Chas **Keys**

*Reproduced courtesy of the NSWSESVA*

Joseph H Lewis-Hughes, known as 'Lew' to all who met him, spent 40 years either as a volunteer member of the SES or on its staff. In that time contributed hugely to the organisation's development as an emergency service. His career spanned the civil defence era of the 1950s and 1960s and the organisation's period as the central emergency service organisation in New South Wales and responsible for the state's preparation for disasters of all kinds.

Lew's introduction to the Civil Defence Organisation, as the SES then was, came in 1955, when he was asked by the first Lismore District Operational Controller, Bill Thursby, to help in the setting up of the organisation in the northern rivers. At this stage Lew was eight years out from his war service in the Royal Australian Navy and well into a career as the Lismore District Valuer in the Valuer-General's Department. When Thursby left Lismore in 1957 Lew inherited the senior CD position, which a year later was re-titled the Richmond-Tweed Regional Controller. Lew held this post for 12 years before being posted to Dubbo in a promotion in his employment.

His contribution to the development of the Richmond-Tweed region was huge. When he became the Controller he had a headquarters staff of five volunteers and a total of 12 local controllers, some of whom had a few volunteers in their still very new local units. Building on the former chief wardens of the wartime National Emergency Services Lew had a regional organisation with more than 600

volunteers by the time he left for Dubbo. These people were well organised, several had been to the Australian Civil Defence School at Mount Macedon and training was well established in all the civil defence and flood management functions then available. Included were such things as rescue, signals, floodboat operation and home nursing. Lew took a strong personal hand in the training in his region, and he set up an effective exercising regime as well.

Moreover he led the development of the Regional Evacuation Plan, which was drawn up to guide the reception of evacuees from Sydney in the event of a nuclear strike. In addition he led the planning for the 'mobile columns' which were to go from Richmond-Tweed to Sydney to help

Defence, Major General Ivan Dougherty, had noted Lew's leadership ability and in the mid-1960s he made him the organisation's Pro (Provisional) Director. This appointment was not publicly known but it was very important: Dougherty created a 'shadow' state headquarters staff, made up of regional controllers and other volunteers, about 20 people in all, to lead the CD&SES organisation in the event that its Sydney-based headquarters became incapable of functioning – for example, because of an enemy strike on the capital. Those were the days when the Cold War was at its height, and a nuclear strike by the Soviet Union was genuinely feared. The alternate headquarters, incidentally, would have operated from an

*Lew's contribution to the building up of the Region and its headquarters in those early years was recognised in 1963 by the award of the OBE.*

what would have been a devastated city. In the 1960s, this planning was at the centre of the organisation's activity.

Lew's contribution to the building up of the Region and its headquarters in those early years was recognised in 1963 by the award of the OBE (Officer of the Most Excellent Order of the British Empire), a high honour equivalent to the AO in the present Australian awards system. Moreover the Director of Civil

underground site beneath the old Bathurst jail. All this was highly confidential, Lew quietly organising the necessary planning and the maintenance of the war-time emergency broadcasting radio station at the Richmond RAAF base.

During the 1960s Lew was heavily involved in the development of the organisation's flood management expertise. It helped, no doubt, that Lismore had many floods: between 1955







and 1969 there were about 20, several invading the central business district. The frequency of flooding created the opportunity to practise, develop and refine the techniques of flood management, and this became Lew's major field of operational activity. He appointed many gauge readers, organised the installation of new gauges and worked on the collection of river height data and its utilisation in the flood warning field. He can fairly be called a pioneer in the development and use of flood intelligence in New South Wales.

Because of this work his headquarters led the state in the matter of flood warnings, the warning messages in big Lismore floods like that of 1974 (roughly a one-in-100-years event) being of very high quality. They contained all the key information – the current river height, the forecast height, an assessment of the likely consequences of the flooding at the predicted height and the actions which people should take to defend themselves and protect their belongings. Years later, the standard of the flood

warning messages which came out of the Richmond-Tweed Region was far higher than those of most of the other regional headquarters of the SES.

When Lew left for Dubbo he must have assumed that he would have a quieter life than the one he had lived in Lismore, especially if the potential demands of the Pro-Director's role did not become reality. But it was not to be: he soon became the Macquarie Region's Staff Officer (Operations) under Regional Controller Dev ('Brookie') Brookfield. Then, in early 1971, there was a severe flood on the Barwon-Darling system and Lew was sent by Dougherty to Narrabri and then Walgett to help manage the flooding there. There were warning, evacuation and resupply functions to manage, and in Walgett's case, a levee to monitor and maintain.

Neither community had a strong SES organisation at the time. As in many country areas the units were token rather than real, and major relief operations were beyond their capabilities. The Walgett operation became a test of using experienced

personnel from the Alternate State Headquarters in support of a local unit.

Dougherty retired in 1973, followed soon after by his long-running deputy, George Gold. Lew applied for the Director's post but was given the deputy's position, which he occupied until his retirement a decade later. As Deputy Director he played a major part in the running of several big flood operations – there were many of these in the 1970s on the inland rivers and on those of the coast – and over the Xmas-New Year period 1974-75 he led the operation in which 13,000 evacuees were received in Sydney after Cyclone Tracy had flattened much of Darwin.

In this operation Lew held many meetings at state headquarters in Sydney and at Sydney Airport to coordinate the efforts of the Police, the departments of Housing, Manufacturing and Youth and Community Services, the Health Commission, the Red Cross, the Salvation Army, the Smith Family, Lifeline, St Vincent de Paul, the Seventh Day Adventist Church, the Commonwealth Department of



Social Security and other organisations. An SES welfare centre was set up at Callan Park, Rozelle, at which evacuees were fed, registered, given clothing and accommodation and had other needs met. Welfare centres were also established at the North Head quarantine facility, at army and naval establishments, at hospitals and at commonwealth hostels. This was a very large and complex operation which went on around the clock for five days at the international terminal and in one of the hangars at the airport. It continued for two weeks at state headquarters. This was the biggest evacuation operation ever seen in Australia.

It was also a major test of the SES and its abilities – a test not unlike that created by the Sydney hailstorm of April 1999 but without the hostile media attention – and the organisation acquitted itself well. Many problems arose, of course, and they were to inform the thinking that went into the first State Welfare Plan which was drawn up over the following two years and

completed in 1977. In this planning, Lew headed the working party which prepared the document itself. The plan covered the roles of federal and state departments and voluntary organisations in the provision of welfare services. All functions – welfare centres, catering, accommodation, clothing, registration and inquiry, personal services and the provision of welfare information and advice – were covered.

had much practical experience from his time in Lismore. As Deputy Director he chaired a joint working party made up of Bureau of Meteorology and SES personnel to review flood warning arrangements in the state. This group produced the NSW State Flood Warning Plan which was promulgated in 1978 and which still has a great influence on flood warning procedures and practices in the state.

*He embodied the notion that planners should be operators and vice versa.*

*Things work best when this is the case!*

In those days the SES had the chairing role in the development of all the state-level disaster plans in New South Wales. Today this role is managed by the State Emergency Management Committee, not by any individual agency.

Lew's planning contribution extended to the flood warning arena in which he

Lew thus had a deep involvement in both operational management and planning for emergency operations. He understood clearly the nexus between the two functions and the needs of each. He made sound decisions during operations, and he appreciated the value of good plans in guiding decision-making during

flood and other emergency operations. He embodied the notion that planners should be operators and vice versa. Things work best when this is the case!

In the late 1970s, recognising the great value of planning, he sought to enlarge considerably the number of planners at state headquarters. At the time there were only two of them, and he argued for ten – a reasonable number given the size of the SES's planning task as laid down in the SES Act of the time. But he was rebuffed, and a decade later the SES was severely criticised by the Office of Public Management for the paucity of its effort in planning for emergency situations.

Amongst his most important contributions to the SES (and indeed to emergency management generally) were in the development of 'intellectual capital'. He gave many addresses at workshops and conferences at what is now called the Emergency Management Australia Institute at Mount Macedon, and some of these were reprinted in the SES's journal which was variously called *The Civil Defence Bulletin*, *The State Emergency Services Bulletin* and *Sitrep*. These were the forerunners of today's Director General's Newsletter. He wrote on themes such as the problems of staffing a civil defence region, the establishment of a headquarters (in terms both of facilities and staff), the exercising of operational control and the management of evacuations during floods.

He also spoke on many occasions about SES matters at forums outside the SES itself. His talks and his writings were based on considerable personal experience and on an ability to think through problems. At one point his knowledge and experience were recognised in an invitation to visit Pakistan to advise on flood management – including warning. Much earlier, in 1964, he addressed the Flood Mitigation Authorities of New South Wales at their annual conference, speaking about the civil defence role in flood times. This may have been the first formal contact between the FMA and the SES; today, the SES features heavily in the FMA's yearly conferences and its quarterly meetings.

Lew was also instrumental in the development of a national professional association of emergency managers.

In 1977 the Australian Institute of Emergency Services was formed, and Lew became its first president. He foresaw a professional journal, the better education of emergency managers, regular seminars and discussion groups dealing with the needs of the emergency services, and the fostering of higher standards for paid and volunteer members of emergency organisations. In the late 1980s the AIES began publication of the journal *National Emergency Response*.

In 1983 Lew retired from active employment with the SES. But he continued on until 1995 as a volunteer, first at state headquarters and then in the Sydney Northern Division Headquarters. At SHQ he assisted in a survey of the state's reserve of radiac instruments, rewrote several natural disaster pamphlets and acted as an adviser on training and other matters relating to the NSW Disaster Welfare Plan – including writing and conducting residential courses for welfare training at Mt Penang. At the Division Headquarters he conducted courses in map reading and information gathering and processing, and he also took a major managerial role in operations. His last big operation was the response to the great northern suburbs hailstorm of early 1991.

Even after he ceased to be an SES volunteer he continued to write on themes of interest to the organisation, especially in relation to history. In 1997 he published a book on the volunteer water brigades which took root on several of the state's rivers from the Hawkesbury to the Richmond from 1870. The last of these, at Grafton on the Clarence River, ceased to operate as recently as 2000; before then, the surviving brigades were gradually absorbed into the SES (sometimes, as at Lismore, as SES floodboat sections). In a real sense the water brigades were forebears of the local units of the SES. For decades they carried out rescue, resupply and other flood tasks on the eastward-flowing rivers north of Sydney.

The book on the brigades continued Lew's career-long interest in flood management. Earlier, while still the SES Deputy Director, he had written a history of flood rescue in New South Wales. This had canvassed the development

of the water brigades and their boats, and the evolution of floodboats after the SES had assumed the flood response role in the mid-1950s. Lew's research dealt with the battles during the 1950s and 1960s over how boats should be constructed and powered: there were debates over materials (clinker, plywood, fibreglass or aluminium), the merits of oars and motors for propulsion, the size of outboard motors and the dimensions of the boats themselves. A big issue was whether different building specifications should be allowed in different areas.

Views on these matters were passionately held in the surviving water brigades and among the growing group of SES floodboat operators. There were debates, too, about registration, training courses, and the sorts of radios which should be carried in boats during operations. A Flood Rescue Boat Advisory Committee, chaired by the SES and incorporating people from the Maritime Services Board, the Police, the Navy and other organisations, was set up in 1956 to develop policy on these issues.

In retirement Lew has retained a keen interest in the SES and its fortunes. He remains a strong supporter of the volunteer concept and he has attended several functions for people retiring from the organisation. He also continues to write, most recently in 2007 commenting on emergency operations in *National Emergency Response*. In 2005 he participated in the SES's 50<sup>th</sup> anniversary celebrations. Lew's was an immense contribution across many of the interests of the SES, and it should not be forgotten. ●

### CHAS KEYS

Chas Keys spent 14 years as an employee of the SES, the last seven as its Deputy Director General (Deputy Commissioner). He has been a frequent contributor to *The Volunteer*, providing articles examining issues, individuals and operations which could not be fitted into his book *In Times of Crisis* which was published in 2005 for the SES's fiftieth anniversary.

# POSTCARDS FROM NEW ZEALAND

Bill Hoyles MAIES

**M**y family and I toured the North and South Islands of New Zealand in September 2016, and encountered many of the hazards that make a holiday memorable.

Having first paid our respects to the Maori people at the Waitangi treaty grounds, we travelled to Forgotten World Adventures and got to drive one of their converted golf-uggies through the disused train tunnels.

From there we drove to Wellington – with many landslides and land slips on the roads less travelled on the way down to the nation’s capital (and windiest place on the planet) Wellington City.

We stood in the earthquake cottage in the Te Papa Tongarewa Museum in Wellington – and experienced what it’s like to be shaken to the core.

We viewed a seismic record of every minor quake and aftershock to be recorded in Wellington – literally dozens while we were there and none felt by us! We also headed underground just at the Museum entrance and saw the amazing base-stabilisers – giant rubber pads on which the entire museum is footed that will dissipate the shaking effect of an earthquake into the future.

We nearly missed the boat, literally! The Inter-island ferry service was cancelled for several days due to storms but eventually made it safely to the South Island and toured the mountain resorts with the obligatory family selfie by the roadside.

We drove past frequent avalanche warnings to a boat journey on the Milford Sound (that isn’t actually a Sound) and heard about the potential tsunami threat!

Finally we journeyed across the Alps on the amazingly beautiful Alpine railway to end our holiday in Christchurch.



## USAR MARKINGS

Immediately before travelling to New Zealand, I had completed a basic introductory workshop on Urban Search and Rescue with my local NSW State Emergency Service Unit.



I thought I might see some relevant photographs in the Earthquake Museum in Christchurch and I was not disappointed.

There were not only photos but a diorama of USAR rescuers from Australia (with a door marked QLD TF1) as well as from New Zealand and Japan.

I purchased my obligatory Quake City t-shirt and my Seismic Display merino socks and then moved on.

What I had not expected was to see a building near the cathedral that was fenced off awaiting repairs, but with a USA Team’s USAR markings there for all to see.

There was plenty of unofficial graffiti on other derelict buildings – as well as murals and other artwork, but somehow this site really hit home for me.

Here was a building still standing that had been searched and marked just as I had been taught.



## WESTLAND TAI POUTINI NATIONAL PARK

Imagine being a park ranger on New Zealand's South Island, tasked with standing out in all weathers, 24/7, year after year, with one hand extended palm-out in the universal 'Stop' sign to prevent you from crossing a barrier.

This was what greeted me in September 2016 at the end of a steep uphill approach to the Fox Glacier lookout, with its many warning signs enroute like 'Don't stop, avalanche area'.

Easy enough to keep moving quickly uphill when I was younger and had more puff, but with the option of 'death by rock-fall' or 'death by exertion-in-old-age', it's not a great lifestyle-choice!

On arrival, the danger warning was reinforced with a large sign that includes a newspaper clipping of the deaths of two Australian tourists who died while taking photos at the base of the glacier.

The glacier itself, at a distance, looks like a grey smudge in the mountain valley with not much happening as you stand and watch it not moving.

I found the experience seriously underwhelming, however the snow-capped peaks, rocky terrain, and the strenuous approach certainly made it worth crossing off my bucket list.

There is an option of a guided tour to get up-close and personal with the glacier's wall, as well as numerous helicopter options to visit the mountain peak.

Also not to be missed are the signs on the approach road that indicate where the glacier had reached in years gone by. If there is clearer evidence of global warming I have yet to see it.



## CHRISTCHURCH ANGLICAN CATHEDRAL

For some reason I had thought that the damage from the 2011 earthquake that hit Christchurch would all have been repaired by the time of my visit in September 2016, and life would be largely back to normal.

Not so. It's quite eerie to visit a beautiful city where the principle fashion accessory is a hi-vis vest, where the dominant sky-line features are construction cranes, and where the Cathedral Square at midday has more workman and tourists than office workers.

Most surprising to me was the lack of progress in repairing the Anglican Cathedral – it instantly reminded me of the Kaiser Wilhelm memorial church in Berlin, which is still unrepaired after the bomb damage of the Second World War and now a permanent reminder of the folly of war.

I watched a chess game being played on the giant chess board in front of the cathedral, marvelled at Hephey's Planted



Whare and Mural with its exotic plants secured to a steel frame, ate lunch from a food van, and then caught the passing tram for a leisurely tour through the city.

At 7pm that night my wife and I walked from our motel to Rangoon Ruby's Restaurant – a distance of about one kilometre – during which time we saw half a dozen other pedestrians and perhaps a dozen cars on the road. The restaurant itself was buzzing and the food was great – but so little night-time movement in such a large city was quite disconcerting.

## CHRISTCHURCH CATHOLIC CATHEDRAL

Lesser reported than the damage to the Anglican Cathedral was that of the Catholic Cathedral. Both cathedrals are still awaiting restoration or demolition, with the Anglican Cathedral having been temporarily replaced with the ingenious Transitional Cardboard Cathedral.

Both have their 'miraculous' earthquake stories.

In the case of the Anglican Cathedral it is the story of a woman who was working in an office on an upper floor of the Cathedral. When the earthquake struck she ignored the conventional wisdom to crawl under the office table, only to find the table being completely crushed seconds later. Luck or a miracle – I guess it depends on your faith.

However the Catholic Cathedral 'miracle' struck me as quite extraordinary. A statue of Our Lady was situated on an upper level facing inwards and overlooking the church interior and its congregation.

When the earthquake struck the statue did not fall over but is said to have revolved 180 degrees so that it no longer faced into the church, but now faced out through a window into the city.

## EMPTY CHAIRS MEMORIAL

Major disasters leave a legacy of memorials. Whether they be a simple memorial of a sign, a garden of rocks and flowers, or an arguably more poignant symbol of loss and grief – each plays a part in reminding us of the frailty of life and how quick someone we love can be lost forever.

Christchurch has its share of small sites that share a memory – such as the site of St Luke's in the city and its 185 pieces of Halwell stone recovered from the church and now re-laid as a memorial garden to the 185 people who died as a result of the 22 February 2011 earthquake.

One of the most moving was the 185 White Empty Chairs memorial. Ordinary kitchen chairs, dining room chairs, bar stools, easy chairs, wheelchairs and even a baby capsule – each painted white and set out on 185 square metres of grass where a church once stood.

There are similar memorials in Krakow (the Holocaust) and Oklahoma City (the Bombing) – but they are both permanent structures whereas the Christchurch memorial is temporary. ●





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*A cultural and hazard reduction burn held near Coffs Harbour was a collaboration between several agencies and several indigenous groups in the area. Photo by Craig Stehn.*





# TAKING CARE OF COUNTRY

Planning an effective cultural and hazard reduction burn can take a huge amount of planning and collaboration. On the Mid North Coast recently, an especially complex cultural burn took months to plan but the benefits are set to be far-reaching. Jamie Bertram, Community Safety Officer, Mid North Coast reports.



**Jamie Bertram**

*District Officer (Community Safety) Mid North Coast Team NSW Rural Fire Service*

*Reprinted with permission from Bush Fire Bulletin 2016 Volume 38 No 1*

*Photo by Jason Booth*

*Photos by Craig Stehn.*



In August 2015, 12 hectares of heathland at the southern end of the Coffs Harbour Airport was burned by a crew of female Aboriginal rangers, local Aboriginal women, female members from several local NSW RFS Brigades and staff from Coffs Harbour City Council and the Nature Conservation Council.

Through collaboration, the participants considered a complex set of cultural, ecological and safety concerns.

The benefits included improvements in bushfire safety, enhanced vegetation communities, the stimulation of bird life in the Coastal Wallum Heathland and an opportunity to develop greater cultural

links between local Aboriginal groups and other organisations in the area.

Over the three years of planning the NSW RFS played a mediating role between the Council, Aboriginal groups in the area, Local Aboriginal Land Councils, the Nature Conservation Council, local airport and CASA. Through discussion and negotiation all the requirements were met resulting in a positive outcome for all concerned. There were numerous meetings and field assessments with Airport Management, Air Traffic Control, Coffs Harbour City Council Environmental Engineers, Airport grounds staff, CEO for the Coffs Harbour

Local Aboriginal Lands Council and the female Aboriginal rangers.

The two-way learning process that occurred throughout the planning and implementation of this burn has been extremely beneficial to improving cross-cultural relationships and understandings between agencies and Aboriginal communities. It was also a great success for the environment and community in the area.

#### **WHY BURN?**

The area may have been without fire for close to 30 years and hazard reduction on the site was vital –





the Coffs Harbour Regional Airport lies to the north, the Southern Cross University to the south west, and the main North Coast railway line is only 400m west of the burn site.

An old tram line used to haul timber to the Coffs Harbour Jetty last century was also included in the burn area and needed to be protected.

The local vegetation also needs fire to thrive.

Local ecologist, Greg Elks, has worked with the Coffs Harbour Local Aboriginal Land Council's Darrunda Wajaar Rangers team, to establish monitoring plots across the site.

"Fire is an important part of the ecology of many Australian vegetation communities. Wet heath communities like this one require fire to maintain diversity over the long term," said Greg.

Low intensity fires would create gaps in the ground cover to allow germination of generalist species from soil seed banks. The burn was planned for the cooler, wetter month of August as wet soil reduces the risk of destructive peat fires in the coastal heath swamps.

While the reasons to burn were many, several important considerations had to be taken into account, not least the Aboriginal significance of the area.

### A SACRED WOMEN'S SITE

On the northern sector of the planned burn, local Aboriginal women identified a woman's mythological site which means, where possible and practical, women were required to carry out the burning. Female rangers from the Minyumi Indigenous Protected Area (IPA), near Casino, assisted with NSW RFS female volunteers from the local brigades including Red Hill and East Bank Brigade. Local Gumbaingirr women for whom the land is their traditional country, and female rangers from Minyumi were also trained and included in the burn. In total there were

eight women involved in the burn, four of whom were Aboriginal rangers.

Fifteen men were active on the southern sector of the fireground; brigades involved were Red Hill Brigade, Boambee Brigade and Eastbank Brigade.

Engaging the women from the Minyumia IPA was a useful addition to the burn. These rangers are partners in the Nature Conservation Council's Firesticks Project which is also supported by NSW RFS. Attending additional burns outside of their IPA, such as this burn at the Coffs Harbour Airport precinct, enables the rangers to gain further confidence in implementing burns in a variety of vegetation types and working with other stakeholders such as the NSW RFS, council and land care groups. This in turn is an opportunity for the rangers to share their own knowledge and experience in fire management and caring for country.

Training has been delivered by the NSW RFS District staff and the Corporate Training Unit to 33 Aboriginal rangers in the Coffs Harbour District. Bush Fire Awareness was initially delivered to rangers in 2008 at the Mid North Coast Team Fire Control Centre. Following this the rangers were interested in Bush Firefighter which was delivered in Corindi Beach at the Yarrowarra Conference Centre and a second course was delivered west of Kyogle at the Toonumbar Water retreat. The Service has gifted NSW RFS PPE to all those rangers who have received training.

With this team of men and women, equipped with cultural understanding and knowledge of firefighting, everything was almost ready to conduct the burn. But safety concerns around the airport and ecological considerations also had to be taken into account.

### PROXIMITY TO COFFS HARBOUR AIRPORT

The burn was directly south of the north/south runway at the Coffs Harbour Regional Airport. The main concern was the potential for fauna, especially birds, to move onto the airport land and runways during and after the burn.

Timing of the burn was therefore crucial. The burn had to be conducted during the evening, once the last domestic flight had set down. Airport Safety Officers were instructed to initiate



*Alita Carbery, a local Gumbangirr woman, was part of the entirely female crew who implemented the burn. Photo by Craig Stehn.*

*It was such a privilege to be able to be involved and to be able to share my experience with my daughter and the younger generation.*

*Alita Carbery, a local Gumbangirr woman from the local Darrunda Wajaarr Working on Country Team*

bird control techniques if required over the coming days and a notice was issued to all aviators using the airport alerting them to the increased risk.

### ON THE DAY

On the evening of 8 August 2015, there was a light breeze and cool temperatures – conducive conditions for a burn.

The participants waited for the touchdown of the final Qantas domestic flight and then commenced the burn, at approximately 1720 hours.

The female rangers began ignition on the north-west corner of the burn site. The other crews were established along the remaining sectors of the burn. Once the burn backed in a safe distance the lighting was taken over by the other sector commanders. Routes were left for fauna to escape the burn.

After months of meticulous planning, the burn went well and there were no escapes.

The next day a good rain fell across the fireground and the burn was patrolled for two days.



*Minyurni female rangers travelled from near Casino to assist with the burn.  
Photo by Craig Stehn.*



## POST BURN ASSESSMENTS

In the months after the burn, the site has had a flush of new growth and an abundance of wildflowers. This will benefit nectar-feeding birds and insects, which will lead to an increase in breeding. Small mammals like the New Holland Mouse are expected to thrive in the first few years after the fire, as the new growth will provide an abundance

of shelter and food.

The Darrunda Wajaarr Ranger team have been regularly returning to assess the response of the vegetation and will undertake ongoing post-burn weed control. The Darrunda Wajaarr Ranger team, along with an ecologist, will continue to monitor and conduct research on the site for the next three years. It has been an ideal opportunity

for the rangers, including local Aboriginal youth, to develop greater skills in vegetation monitoring and research.

Among the many benefits to bush fire safety in the area, and to the flora and fauna in the area, this planned burn has seen the development of important partnerships between Coffs Harbour City Council, the NSW RFS and the local Aboriginal community. ●

## ABOUT THE AUTHOR

Jamie Bertram joined the NSW Rural Fire Service in 1988, and is a volunteer member of the Karangi Rural Fire Brigade.

Since 1989 Jamie held the positions of equipment officer, Deputy Captain, Snr Deputy Captain and Brigade Captain, a position he held for 13 years.

In 2003 Jamie was elected as Group Captain by the six brigades in the western sector of the Coffs Harbour Shire a position he held up to 2013.

In 1992, Jamie commenced work

with the Forestry Commission of NSW where he worked up to 2008. During this time with the agency he held various positions as Heavy Plant Operator, Road Construction Supervisor, Harvesting Supervisor and the last 10 years as Ecology Field Supervisor in the Southern Area Command of the North East Region of NSW.

In 2008, Jamie was successful in acquiring a position with the NSW Rural Fire Service as Team Community Safety Officer. The position portfolio involves Hazard Management,

Community Engagement, Hazard Reduction Operations, & Environmental Assessment and Planning.

Since then, Jamie has worked closely with the local Gumbainggir Aboriginal Community and the Coffs Harbour & District Local Aboriginal Lands Councils Darrunda Wajaarr Green Team. He has been able to deliver Bush Fire Fighter Training to the team and have them assist the local volunteer brigades with prescribed burns on Gumbainggir Country.

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# TECHNICAL NOTE: EARTHQUAKE SCENARIO

## Adelaide, Mw 6.0



Valentina **Koschatzky** and  
Felipe **Dimer de Oliveira**

*Risk Frontiers*

### UNFORESEEN IMPACTS Chemical and high-risk industrial plants

These are usually located away from residential zones. In Adelaide we have located the Penrice Soda Products plant in Osborne, which is located in the area experiencing a ground motion level (PGA) of around 0.13g.

It is expected that high-risk facilities will be designed for increased resilience to earthquake damage, thus the probability of an accident induced by an earthquake is classified as low. If, however, there were damage, it would be such as in the 1998 Longford gas explosion in Victoria, Gippsland:

*"The explosion took place on 25 September 1998, at the plant, killing two workers. Victoria's gas supplies were severely affected for two weeks. Jet fire developed and lasted for two days, the rupture also led to other releases and minor fires. The plant was shut down. The Victorian Energy Network Corporation shut down the states entire gas supply, devastating Victoria's economy, crippling industry and the commercial sector (especially the hospitality industry which relied of gas for cooking). The loss to industry during this crisis was \$1.3 billion AUD. Natural gas was also widely used in houses in Victoria for cooking, heating, and water heating. Many people had to endure 20 days without gas, hot water or heating. People were outraged by the lack of any substantial compensation on their next gas bills,*

This is part II of a Technical Note by Valentina Koschatzky and Felipe Dimer de Oliveira. Dr Koschatzky was a guest speaker at the South Australian Division Annual General Meeting held in May 2016. Please view *National Emergency Response*, Spring edition, for Part I.

*with the average pay out being \$10."*  
*From Wikipedia [2015b].*

### Hazardous material release

Hazardous materials are not exclusive to heavy industry and may be released as a consequence of building collapse. These may include carcinogenic or corrosive gases, poisonous liquids that contaminate the water table. Asbestos was used in Australia from the 1950s until 2003 when it was banned. Asbestos may be exposed as a result of earthquake building damage in an earthquake. Irrespective of the risk, it will impose large clean-up costs and require the cordoning of many properties.

### Fire following earthquake

Fire following earthquake has caused extensive damage in the past. Well-known cases are the San Francisco 1906 and Tokyo 1923 earthquakes, where much of the damage was caused by fire. Extensive fire following earthquake damage is less common in present times, and will likely be localised to high risk sites as was the case for the Cosmo Oil Company fire following the 2011 Tohoku earthquake in Chiba, Japan. It is conceivable that a gas pipe failure could lead to a big fire in the area affected by this scenario. In that event, the continued functioning of the water supply for fire fighting would become critical.

### Long series of strong aftershocks

The Christchurch event was notable for its unusual frequency of

aftershocks, with the most damaging event (M6.3 Lyttelton) occurring as an aftershock of the original event (M7 Darfield) four months earlier.

This earthquake sequence seriously disrupted recovery activities, and although unusual, aftershocks did more damage than the main quake. This occurred because the aftershock was located directly below the CBD whereas the main shock was located to the west of the CBD at a closest distance of 30km. There is an example of an even more unusual earthquake sequence in Australia.

*"During the period 1883-1892 around 2000 earthquakes occurred off the NE coast of Tasmania, in the west Tasman Sea, mainly to the east of Flinders Island. These were felt in NE Tasmania or in the islands off the coast and the three largest, in July 1884, May 1885 and January 1892, had estimated magnitudes of 6.3, 6.6 and 6.9. All three caused damage in Launceston and were felt over most of Tasmania, in SE Victoria and the far southeast of NSW."*  
*From Marion [1987].*

The earthquake sequence in Christchurch did evidently move away from the city, only one year after the main event, and even its short duration compared with the 1883-1892 Tasmanian sequence has posed a serious challenge to the recovery of the Christchurch CBD.

If an earthquake sequence like the Tasmania sequence occurred near

Adelaide it would probably result in a decrease in population and economic importance of the city as businesses migrated to safer areas. It could result in a reconfiguration of Melbourne, as older suburbia will progressively close down over the years as the aftershock sequence progresses. The results of such scenario would be devastating for Australia as has been the case for New Zealand.

## SOCIAL IMPACTS

A substantial earthquake event in Adelaide, located near the CBD, could have the potential to have a vast impact on peoples' livelihoods. Earthquakes not only cause immediate destruction but can have long lasting impacts.

Earthquakes can cause damage to buildings, infrastructure and vital services. People can be trapped or isolated for hours and be without water, gas and electricity. Telecommunications and web services can crash as a result of an overload of people trying to find information or each other. Rupturing of sewage pipes and other waste lines can have the potential to contaminate ground water and soils. Large earthquake events can often be followed by aftershocks, hindering response and recovery and causing ongoing trauma and unrest.

## SHORT TERM IMPACTS

### Isolation/separation

People can be trapped or isolated for hours and be without water, gas and/or electricity.

"As a result from the Christchurch earthquake the suburb of Lyttleton was isolated from the city in the first days after the quake." From Wikipedia [2015c].

*"One of the survivors from the Christchurch CBD was trapped in the quake-crumpled Pyne Gould Corporation building for six hours before rescue workers could free her."*  
From *The New Zealand Herald* [2012].

### Loss of lifelines/services (water, sewage, gas and electricity)

Through excessive ground shaking, liquefaction, and rock falls, lifeline services can be cut off/shutdown.

It may take some time to get these back up and running depending on

damage, access to critical infrastructure, and the labour available. The loss of water, gas, electricity and sewage systems can cause unrest, health problems and hazards in themselves (fires, flooding, contamination and electric shocks), see section 5.4.

### Building damage and loss of refuge (damage to home and possessions, access to home blocked off, etc.)

The modelled scenario for Adelaide predicts a large number of homes destroyed or not suitable for occupation, section 5.1. That would create a large number of people that could be homeless and in need of shelter.

The amount of time for which people would need shelter would depend on the number of family and friends that could take them in, how long it would take for building inspections to be made, how long it would take lifeline services to be back up and running, and how long it would take for residents to regain access after areas were cordoned off or had access ways destroyed/blocked.

### Loss of communication

Loss of communication can be due to a variety of reasons such as the crashing of telecommunication services, website crashes, and loss of power meaning mobile phones cannot be charged or cordless home phones will not work. One thing that not everyone thinks of is that cordless landlines still need main power to work. Telecom NZ ended up doing a drive to collect old corded landline phones that don't require power to work and sent them down to Christchurch people who still did not have power.

### Strain on emergency services

During a natural disaster a number of hospitals, police and fire stations can be damaged or become inaccessible, section 5.3. This puts a strain on the remaining emergency services to not only cope with the event response but to also take on patients and cases from the inoperable services. This load will continue to raise with an increase in crime and violence, and ongoing health problems from contamination and/or loss of lifelines.

### Vandalism/crime

Natural hazard events can bring the best out in a community but it can also

bring out the worst in some people. Often power outages and cordoned off areas can attract opportunists. Looting is common due to inoperable alarm and surveillance systems and the emergency services being distracted with response matters.

### Long-term impacts

- Long-term injuries
- Moving house/fixing house
- Battles with insurance or government pay-outs
- Loss of income: Some people will not be able to work due to injury, loss of jobs or rebuilding of business
- Continual unrest: Due to ongoing damage, aftershocks or emotional stress
- Increase in violence/drug and alcohol use.

Ongoing impacts of the main event and also continuing aftershocks can put strain on peoples' emotions and can cause loss of sleep. Traumatic events like that of large earthquakes can often be followed by an increased home violence, a decrease in productivity, an increase in drinking or drug use, and increased crime. This is often caused by on-going impacts of the main event (loss of lifelines, homes, and incomes) and aftershocks that can continue for some time after the main shock, which causes unrest and increased stress on the communities affected.

*"Police call outs after the September 2010 Christchurch earthquake showed that domestic violence incidents increased by 47 per cent in the three weeks after the event."*  
From Linch, K. [2011].

Economic loss in the area: residences moved elsewhere, business or industry moved elsewhere/shutdown, loss in tourism.

## SIMILAR PAST EVENTS

An important element in devising scenarios is learning from the experience of relevant past events. To create a realistic scenario it is desirable to make use of information from events that occurred in areas of similar demography, construction practices and cultural background.

Australia has low seismic activity so our historical experience is limited. Christchurch (New Zealand)





on the other hand, has recently been devastated by a series of earthquakes. Given the similarities between New Zealand and Australia, we can use observations from damage assessment field work done following the Christchurch event to hypothesise a realistic scenario for the Adelaide region. This experience also allows us to draw important conclusions, in particular for impacts not covered by models, such as damage to infrastructure, social impacts, unforeseen consequences and long-term impacts. It should be kept in mind that the transferability from the Christchurch experience to a possible earthquake scenario in Adelaide is limited to the older Christchurch structures that have not been seismically retrofitted. We also use the experience obtained from the 1989 Newcastle earthquake, which is third most expensive natural disaster in Australia, in terms of insured losses when normalised to current societal conditions, [Crompton, 2011].

Finally we look at the earthquake that hit Adelaide in 1954 as it occurred in the vicinity of the chosen scenario event. There is however little information we can gather from it as the available records of the sustained damage is limited and the socio-economic condition as well as the physical extent of the urban area has changed dramatically in the last 60 years.

## ADELAIDE, SA, AUSTRALIA

### Summary

- 1 March 1954 at 3.40am
- Magnitude 5.5
- Casualties: no deaths, three injuries [Dyster, 1996]
- Estimated damage: AUS\$8 million (1954 value) [Sinadinovski et al., 2006].
- The most severe damage was sustained at Tapleys Hill and Blackwood.

### Buildings

- Many houses were cracked and heavy pieces of masonry fell from parapets and tall buildings in the city.
- One of the settlement's earliest buildings, the Victoria Hotel, partially collapsed.

Other major buildings severely damaged included the local church,



Post office clock tower (source: Government of South Australia. Department of State Development).



Heavily damaged house in Seacombe Park (source: Government of South Australia. Department of State Development).

St Francis Xavier Cathedral, the Adelaide Post Office clock tower and a newly completed hospital in Blackwood, which sustained major damage in all its wards and offices (though an operating theatre survived).

- The Britannia statue in Pirie Street, Adelaide was badly damaged, and since it had also been similarly damaged in the 1897 Beachport and 1902 Warooka earthquakes, the clock in the statue was permanently removed.

### Utilities

- The Troubridge Island Lighthouse off the south east corner of Yorke Peninsula 83km west of Adelaide across the Gulf St Vincent shut down after the quake damaged its generator while the Cape St Auburns Lighthouse on Kangaroo Island began flashing irregularly.

## NEWCASTLE, NSW, AUSTRALIA

### Summary

- 28 December 1989 at 10.27am
- Magnitude 5.6
- Casualties: 13 deaths, more than 160 injuries
- Estimated damage (2011 normalisation): AUS\$3,240 million Insurance Council of Australia [2015].

### 8.2.2 Notes

- The number of people in the city on the day of the earthquake was lower than usual due to a strike by local bus drivers.
- 300,000 people were affected and 1,000 made homeless.



Union Street shops sustained severe damage (source: The City of Newcastle).



Damage to the Parkview Hotel, Maitland Road, Islington (source: The City of Newcastle).

### Buildings

- The earthquake caused damage to over 35,000 homes, 147 schools, and 3,000 commercial and/or other buildings, with significant damage caused to 10,000 homes (damage worth over \$1,000) and 42 schools (structural damage), within the immediate Newcastle area.
- 300 buildings were demolished including more than 100 homes, The Newcastle Workers Club, The Century Theatre and King's Hall.

### Transport

- For few days, only city workers, essential services personnel, residents and other people with valid reasons were allowed into the city area.

- Roads were not directly damaged but traffic was disrupted for some time due to collapsed and damaged buildings. The Newcastle to Broadmeadow rail link was closed for a couple of weeks. The structural condition of some buildings overlooking the line was the main reason behind the closure. The rail line was undamaged. Superficial cracks appeared in overhead structures and in signal boxes but these did not affect operations.

### Utilities

- The earthquake had a significant effect on the high voltage transmission assets of the NSW electricity supply. Multiple failures of equipment, mainly switchgear, occurred in many electricity substations closest to the earthquake epicentre. These failures initiated a general and immediate shut-down of electricity supply to both industrial and domestic consumers in the affected area. The high voltage supply was restored to major industrial customers 1 ½ hours after the incident. Restoration of supply for general distribution began within 30 minutes, with all bulk supply points energised after 2 ½ hours. It took three weeks to repair most of the major circuits in the grid and many months to complete the restoration.
- The sewage and water supply systems performed extremely well during the earthquake. Services to affected properties were restored with little disruption. There were now no major problems affecting essential water supplies or sewage systems.

## CHRISTCHURCH, NEW ZEALAND

### Summary

- 22 February 2011 at 12.51pm
- Magnitude 6.3
- Casualties: 185 deaths, 1500-2000 injuries
- Estimated damage: NZ\$ 20-30 billion.
- As the earthquake hit at the lunch hour, some people on the pavements were buried by collapsed buildings.

### Buildings

- Of the 3000 buildings inspected within the Four Avenues of the central city by 3 March, 45 per cent had been given red or yellow stickers to restrict access because of the safety problems. Many heritage

buildings were given red stickers after inspections. One thousand of the 4000 buildings within the Four Avenues were expected to be demolished. Of 220 buildings more than five storeys tall, 110 were demolished by May 2012. While damage occurred to many older buildings, particularly those with unreinforced masonry and those built before stringent earthquakes codes were introduced, highrises built within the past twenty to 30 years performed well.



*Extensive parapet damage in Christchurch (source: Risk Frontiers).*



*Facade collapse (source: Risk Frontiers).*

### Transport

- Road and bridge damage occurred and hampered rescue efforts.
- Soil liquefaction and surface flooding occurred. Road surfaces were forced up by liquefaction, and water and sand were spewing out of cracks.
- A number of cars were crushed by falling debris.
- In the central city, two buses were crushed by falling buildings.
- Christchurch International Airport was largely unaffected by the earthquake. New Zealand airspace was closed for a short time while facilities were inspected and Christchurch International Airport was closed to all but military and emergency traffic.

### Utilities

- The impact on the electrical stability and operation of both National Grid and regional supply was negligible. In particular the power to the National

Grid was unaffected, while power to the feeders into Christchurch City and regional substations was unavailable for up to 4.5 hours while safety checks and minor repairs were made. But in NZ, after the 1987 Edgumbe earthquake, the heavy equipment installed in substations (e.g. transformer banks) is seismically restraint. The low and medium voltage distribution network, on the other hand, suffered significant damage: of the 66 kV underground cable network, 50 per cent of cables were damaged, 30km out of a total of 60km. Regarding the 11 kV underground cable network, 14 per cent of cables were damaged, 330km out of a total of 2,300km. The 33 kV, 11 kV and 400 V overhead lines experienced some relatively minor damage including cracked insulators and poles affected by liquefaction. Despite the severe physical impact on the distribution and sub-transmission network, power was restored to about 50 per cent of occupied households on the day of the event, 75 per cent after two days, 90 per cent within 10 days and 98 per cent after two weeks. However, it will be a number of years before the network is restored to pre-event levels of functionality.

- The water and waste networks experienced extensive damage. Approximately 50 per cent of the city was without water for the first days following the earthquake; more than a third of households were without water for over a week. A month after event, over 95 per cent of occupied units (outside of the cordoned Christchurch CBD) had water, however a 'boil order' was in-place for over six weeks for most of the city due to potential contamination caused by severe damage to the wastewater system. Chlorination, which was not used pre-earthquake, remains a requirement to ensure water is disinfected. Water conservation orders are in place as a result of damage to key water reservoirs and the loss of many groundwater pumping wells. However, with few exceptions water reservoir structures and pump stations performed very well owing to pre-earthquake engineering and seismic upgrades. The city continued to rely heavily on a temporary sewage

service facilitated by chemical and portable toilets for over a year. Raw sewage continues to be disposed in the rivers and estuaries due to the inability to treat the waste as a result of significant liquefaction induced damage at the Bromley Waste Water Treatment Plant. It will take years to return the water and wastewater systems to pre-earthquake functions.

Following the earthquake, the gas feed supplies into the system were closed, as a precaution. No damage was observed either to the MDPE distribution pipes or to their welded joints, despite the gas company's pipes traversing zones of severe liquefaction and ground deformation. The gas mains outside the CBD cordon were re-livened within nine days after the earthquake.

Reconnection of customers continued during and after the re-living operations of the mains and were completed within 10 days after the earthquake. 15 per cent of the piping fell within the CBD cordon and could not be restored immediately after the earthquake. All services that could be restored were restored within two weeks. ●

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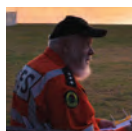
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# TBW 2016



## The Biggest Workout By Bill Hoyles

**N**SW emergency services organisations including Burwood Police, Canada Bay SES and Rhodes Fire and Rescue Organised took part recently in the Biggest Workout 2016, which included competing in a tug of war.

This annual event raises funds for cancer survivors from the Concord Hospital Cancer Survivorship Centre.

SES volunteers assisted in patrolling the event, which included a flood-boat on the Parramatta River.

This event provided a great opportunity for the local community to exercise and raise funds for a good cause, and for local emergency services to come together in support of their local hospital. ●



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