BUSHFIRE RISK STRATEGY MOLONGLO

STAGE 3, DENMAN PROSPECT &

THE MOLONGLO RIVER CORRIDOR

AUSTRALIAN CAPITAL TERRITORY

PREPARED FOR THE LAND DEVELOPMENT AGENCY

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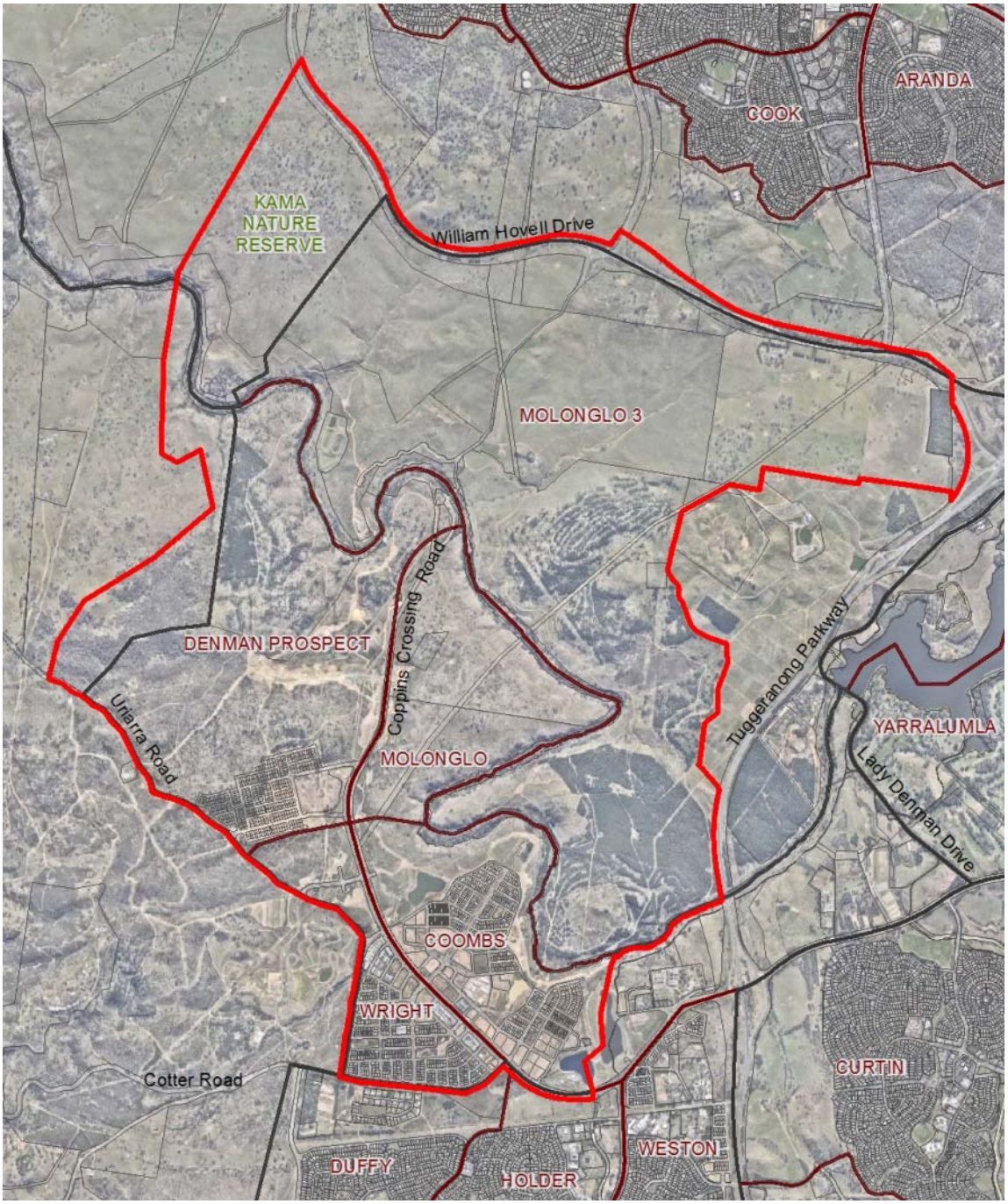
SECTION 1

INTRODUCTION

1.1 Background.

Australian Bushfire Protection Planners Pty Limited has been commissioned by the Land Development Agency [LDA] to undertake a Bushfire Study for Molonglo Stage 2, Stage 3 and the Molonglo River Corridor. **Figure 1** shows the study area.

Figure 1 – Plan of Study Area.



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The objective of the brief is to guide the development of the Land Development Agency Masterplan for the Molonglo Stage 3 study area, review the bushfire protection measures to Molonglo Stage 2 [Denman Prospect] and the Molonglo River Corridor and prepare a report on the findings of the study detailing the recommended bushfire protection measures identified by the study group.

Scope of Work – Molonglo Stage 2/3 and Molonglo River Corridor Study:

1. Review existing literature/reports & studies;

2. Review the study undertaken by Umwelt to determine the ecological constraints and opportunities for fuel hazard reduction management;

3. Attend pre-workshop site familiarisation;

4. Attend and participate in a workshop between LDA, Umwelt, TaMS Fire Management Unit and EPD to discuss all issues related to the protection of the north-western edge of Molonglo Stage 3; the western edge of Molonglo Stage 2 and the Molonglo River corridor;

5. Examine the results of the workshop, liaise with LDA & Umwelt and others [as required] to identify the measures which are required to be implemented to mitigate the potential bushfire risk;

6. Attend and participate in a follow-up workshop between LDA, Umwelt, TaMS Fire Management Unit, EPD, ESA, ACTRFS, Fire & Rescue ACT and other selected Stakeholders to present the findings/results of the initial workshop and the recommendations determined in the review of these findings/results;

7. Review the results of the follow-up workshop, liaise with LDA & Umwelt and others as required, to finalise the measures which are required to be implemented to mitigate the potential bushfire risk;

8. Prepare, in co-operation with Umwelt, a report which details the findings of the studies undertaken, the results of the workshops and the final recommendations on those measures required to be implemented to mitigate the bushfire risk to the western, north-eastern urban edge and the Molonglo River corridor;

9. Attend and participate in a final workshop between LDA, Umwelt, TaMS Fire Management Unit, EPD, ESA, ACTRFS, Fire & Rescue ACT and other selected Stakeholders to present the final report;

10. Generally, liaise with LDA, Umwelt, TaMS, ESA, ACTRFS, Fire & Rescue ACT and other ACT Government Departments as required.

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1.2 Information Reviewed.

The following report/studies were reviewed as part of the scope of works:

- The Molonglo River Park – Concept Plan prepared by Hassell – September 2011;
- The Molonglo Valley Plan for the Protection of Matters of National Environmental Significance [NES Plan] September 2011;
- Molonglo Vegetation Survey – Baseline Condition Assessment prepared by Ecological Australia – July 2013;
- Molonglo Stage 3 Slope Analysis – LDA;
- Bushfire Risk Assessment Report – Molonglo Structure Plan – prepared for ACTPLA, 19.7.2005;
- Updated Bushfire Risk Assessment Report – Molonglo Structure Plan – prepared for ACTPLA – 26.4.2006;
- Bushfire Risk Assessment Report – Molonglo Stage 2 Group Centre prepared for Indesco 23.8.2012;
- Territory Plan - ACTMAPi;
- Molonglo Stage 2 Vegetation Conservation Assessment prepared by Openlines, February 2014;
- Indicative Fire Management Strategy – Urban Area – TaMS – 2015;
- Indicative Fire Management Strategy – Molonglo Valley – TaMS – 2015;
- Analysis of Vegetation Structure and Fire Risk – Umwelt – April 2015;
- Molonglo River Reserve [Kama] Operational Plan 2014 – 2017 – TaMS;
- ACT Strategic Bushfire Management Plan – Version 3 – 2014;
- ACT Bushfire Management Standards – Strategic Bushfire Management Plan – Version 3 – 2014;
- Briefing Note on the Ecological Values of the Kama Nature Reserve – Molonglo Stage 3 Outer Asset Protection Zone – Umwelt – October 2013;
- Bushfire Risk Assessment for the north-western edge of Denman Prospect [Aurecon Australia Pty Ltd – 25.2.2014] - Incomplete.

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1.3 Review of Documents.

The following documents have been reviewed and a brief summary of the findings/recommendations of each follows. A more complete summary is at **Appendix A**:

1. Bushfire Risk Assessment Reports prepared by Australian Bushfire Protection Planners Pty Ltd [ABPP] for the Molonglo Structure Plan [August 2005 & April 2006];
2. The Molonglo River Park Concept Plan – ESDD (Hassell) – 2012;
3. The NES Plan – ACTPLA - 2011;
4. The Adaptive Management Strategy – TaMS – 2013; and
5. The Draft Indicative Fire Management Strategy – Molonglo Valley – TaMS – 2015.

1.4 Summary of the Review of Reports.

The following is a summary of the findings/recommendations of the documents reviewed:

1. **Bushfire Risk Assessment Reports prepared by ABBP – 2005 & 2006:**

The Bushfire Risk Assessment Report 2005 prepared by ABPP stated:

"The long exposure of the north-western edge of the precinct to uphill burning fires, influenced by hot, dry, strong north-westerly winds, will result in significant fire impact either directly or indirectly from ember attack, depending on the level of protection provided by active management of the fuels within the river corridor.

Similar impacts may also occur to the western / south western edge from westerly and south-westerly wind-driven fires and the influence of wind turbulence in the Mount Stromlo area.

The northern edge will be impacted by fires burning within the habitat corridor, north of William Hovell Drive.

Due to the level of risk and to address the potential impacts of future bushfires to the exposed urban edge and the concerns over the long-term viability of minimising fuel loads within the abatement zone, a Critical Management Zone should be provided to a minimum width of 300 metres.

The objective of land uses within the Critical Management Zone should be to provide permanent management of the hazardous fuels to levels which prevent the spread of fire into the urban edge.

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The Molonglo River Corridor will separate the eastern development node from the western development node and therefore provide a direct fire path into the suburbs adjoining the corridor and to the International Arboretum to the south east.

The river corridor separating the north-eastern and south-western nodes of the East Precinct should be activity managed as a recreation reserve/public park to mitigate the effects of fire runs along the river".

The Bushfire Risk Assessment Report 2006 prepared by A B P P retained the recommendation for the provision of a Critical Management Zone to the north-western edge of Molonglo and notes that the Draft Structure Plan had introduced 'Lake Molonglo' with the construction of a new dam on the Molonglo River.

For the Critical Management Zone [CMZ] the report stated:

- ***Purpose.***

To provide a permanently managed fuel reduced zone, wide enough to mitigate the impact of radiant heat and ember transfer to the urban edge during major bushfire events.

- ***Location.***

The Critical Management Zone shall be located beyond the edge of the Inner Asset Protection Zone on the north-western and northern edge of the western "node" and the south-western edge of the East Molonglo precinct; the northern, north-western, western and south-western edge of the Central Molonglo.

- ***Depth.***

A minimum width of 300 metres shall be provided. (Minimum 100 metres width provided to the north-western edge of the East Molonglo precinct).

- ***Establishment & Maintenance.***

The Critical Management Zone shall be established on the hazard side of the Inner Asset Protection Zone and shall extend to the widths nominated.

The zone may contain agricultural pursuits which permanently minimise combustible fuel ground litter, (vineyards, orchards); or land uses that utilize irrigation supply drawn from grey water recycling, or irrigation from the new lake created by the damming of the Molonglo River. Such land uses may include the cultivation of summer crops/Lucerne.

The Critical Management Zone may also include recreation and open space facilities such as Golf Courses, Sports Fields, Carparks etc.

Where these land uses are not utilized to provide the Critical Management Zone and the zone consists of Habitat Corridors/Rural Land, a stock proof fence with access gates shall be provided on the outer edge of the zone. A 30 metre wide wind break shall be established by planting smooth barked trees on the outer edge of the zone.

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A second wind break shall be established to a width of 10 metres, 10 metres from the Inner Asset Protection Zone/Critical Management Zone boundary.

A four (4) metre wide fire trail shall be established on the centre line of the Critical Management Zone, with link roads provided to the edge road at approximately 500 metre intervals.

Management of the combustible fuels within the CMZ shall be undertaken to maintain a Low – Moderate Overall Fuel Hazard, in accordance with the methodology provided by the NRE Overall Fuel Hazard Guide.

Management shall be implemented by regular stocking of the zone, or by a combination of mechanical slashing/stocking/hazard reduction burning. A Fuel Management Plan shall be prepared for the maintenance of the Critical Management Zone, irrespective of land use".

The final Structure Plan for Molonglo removed the damming of the Molonglo River, primarily due to the results of ecological studies, and replaced the lake with the Molonglo River Park [Nature Reserve] and established the Kama Nature Reserve to the northwest of Molonglo Stage 3.

These changes to the Draft Structure Plan – i.e. establishment of a Nature Reserve to the northwest of Molonglo Stage 3 and within the Molonglo River corridor, increase the bushfire risk to future development located adjacent to the north-western edge and to both sides of the river corridor.

The examination of the mitigation measures required to provide a reduction of this risk forms the core objective of the Working Group established by the Land Development Agency.

2. Molonglo River Park Concept Plan – ESDD (Hassell) – 2012

The Molonglo River Park Concept Plan prepared by Hassell supports the recommendation of the provision of the 300 metre wide 'Critical Management Zone' to the north-western edge. Note that the Hassell concept plan was completed after the NES Plan and before the Adaptive Management Strategy and presented recommendations for the management and development of the river corridor.

The Concept Plan also recommended that the river corridor should be managed for ecological values with the corridor being broken into precincts to prevent the 'wick' effect and in particular the management of the western entrance to the river park and the area around the sludge ponds to mitigate the passage of fire along the river.

It calls for strategic discontinuity zones within the riparian corridor which aim to reduce the ability of a fire to move continuously up the corridor and into the urban areas, and provide access for defense and fuel management.

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One of those areas would be located around and to the west of Coppins Crossing, from the proposed sewer line crossing to the proposed John Gorton Drive crossing the river. Another one would be at Misery Point.

The Hassell report goes on to describe the vegetation in the recreation areas would contain large areas of groomed grassland maintained to a height of less than 100mm with scattered tree planting as well as formal parks and gardens with irrigated plantings.

3. The NES Plan – 2011:

The NES Plan provided, under Section 2.3 – Bushfire Management Framework a 'motherhood' statement about bushfire management which reads:

"Within the strategic assessment area fire management will be aimed at protection of both built assets and MNES values. This will be achieved through the identification of appropriate asset protection zones and application of hazard reduction techniques that will both:

- *Ensure that the standards for fuel loads in the SBMP are met; and*
- *Protect MNES values through the use of sympathetic management techniques".*

The aim of this document does not address the recommendation that the vegetation in the river corridor or on the land to the west of Molonglo 3 [Kama] and Denman Prospect be managed to mitigate the impact of fire on the north- western edge of the future urban development and from a fire spreading along the river corridor.

In the document under Management and offsetting it called for the establishment of a buffer outside of the Kama Nature Reserve on its eastern side to protect the ecological values of the reserve. It went on under Commitments to MNES:

"Establish a buffer outside the Kama Nature Reserve between the reserve and the proposed development area, and allow for appropriate uses consistent with nature conservation uses of the reserve. The buffer will be developed to ensure that fire management is undertaken outside of the Kama Nature Reserve and will provide protection against urban edge effects."

It assumed that ESA would agree to no bushfire management inside Kama Nature Reserve despite there being a requirement underlying strategic bushfire management in the ACT that individual land managers are responsible for bushfire management on the land they manage. It also assumed that no bushfire management would be undertaken despite Kama being identified on the ESA website as being managed as an SFAZ (agricultural).

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There are no dimensions provided in the NES Plan for the width of the buffer.

The document does not address the potential bushfire risk to the future development adjacent to the north-western edge or the river corridor.

4. The Molonglo Adaptive Management Strategy – TaMS 2013

The Molonglo Adaptive Management Strategy (AMS) was a key commitment from the NES Plan. Its purpose was to define a set of measures designed to achieve the conservation outcomes and performance targets for MNES in Molonglo strategic assessment area.

One of the outcomes of the baseline condition assessment was that an assessment of the buffer zone consisting of patches O2, O3 and O4 located to the east of Kama Nature Reserve found that these patches were not representative of a Threatened Ecological Community.

Under Management Objectives for fire, the document makes the statement that fire management activities for the purposes of protecting the urban development east of Kama Nature Reserve will be undertaken outside Kama Nature Reserve. It goes on to mention:

"The prescribed eastern buffer zone for Kama Nature Reserve is to ensure that fire management is undertaken outside of the Reserve and will provide protection against edge effects."

There are no dimensions provided in the AMS that defines the width of the buffer to Kama Nature Reserve.

The document does not address the potential bushfire risk potential to the future development adjacent to Kama Nature Reserve.

5. Draft Indicative Fire Management Strategy – TaMS 2015:

TaMS have prepared a draft Indicative Fire Management Strategy – Urban Area and the Indicative Fire Management Strategy – Molonglo Valley. It is considered that the recommended bushfire management strategies contained within the Molonglo River Concept Plan were not translated into the management strategies proposed by TaMS.

The recommendation provided in the Australian Bushfire Protection Planners reports and the Molonglo River Concept Plan that a 'Critical Management Zone' [CMZ] be provided to the northwest of the urban development [and river park] was not adopted in favour of the retention of ecological and habitat values.

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Similarly, the Molonglo River Concept Plans' recommendation that the river corridor be broken into precincts to prevent the 'wick' effect and in particular the management of the western entrance to the river park and the area around the sludge ponds to mitigate the passage of fire along the river was not adopted.

1.5 Working Group.

In late 2013 the LDA identified the need to establish a working group to examine the outstanding issues relating to the bushfire risk to the north-western edge of Molonglo 3; Molonglo Stage 2 [Denman Prospect] and the Molonglo River Corridor.

The brief of the Working Group was to bring together all Government Agencies involved in the development of the Molonglo East precinct to enable consideration of previous studies, undertake site inspections and consider all options available so as to develop a report that establishes the principles, processes and funding required to address the bushfire risk. Representatives of Government Agencies included:

- Dave Richardson [LDA];
- Kerry Browning [LDA];
- Adam Carmody [LDA];
- Dylan Kendall [TaMS];
- Adam Leavesley [TaMS];
- Nick Lhuede [ESA];
- Greg Potts [ACT RFS];
- Conrad Barr [Acting Chief Officer] ACT Fire & Rescue;
- Andrew Starke – Commissioner ACT Rural Fire Service;
- Ros Ransome [TaMS];
- Steven Gianakis [EPD];
- Daniel Iglesias [TaMS];
- Tony Corrigan [TaMS]; and
- Stuart McKenzie [EPD]

Two external companies were commissioned to provide assistance to the Working Group, Umwelt to undertake a peer review of the previous ecological studies and additional ecological investigations and ABBP to provide advice on bushfire risk, fire protection strategies and the preparation of a Bushfire Report.

These companies were represented by;

- Peter Cowper Armstrong [Umwelt];
- Rob Armstrong [Umwelt]; and
- Graham Swain [ABPP].

Appendix B provides details on the Working Group, including meeting and site inspection dates, attendees and decisions/resolutions determined.

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1.6 Studies Undertaken by Umwelt.

Stemming from the second meeting of the Working Group the LDA commissioned Umwelt to undertake a study into the ecological values of the Kama Nature Reserve – Molonglo Stage 3 Outer Asset Protection Zone.

A copy of the study prepared by Umwelt [15th October 2013] is attached as **Attachment A**.

The purpose of the study was to provide LDA with a comparison of the ecological values of the 200 metre zone either side of the interface between Kama Nature Reserve and the Molonglo Stage 3 development.

The findings of the study identified that the condition of the 200 metre wide area inside the eastern boundary of Kama Nature Reserve is variable, comprised of a mosaic of high condition box-gum woodland, low condition natural temperate grassland and low condition Scribbly Gum woodland.

The ecological condition of the 300 metre wide area of the western boundary of Molonglo Stage 3 [adjoining Kama Nature Reserve] is generally low, consisting of degraded exotic pasture, and an area containing scattered Blakely's red gum with an exotic understorey and is not the Box-gum Woodland community.

The report confirms that the area is dominated by exotic pasture grasses and the only feature of ecological significance is the presence of five potential pink- tailed worm lizard habitat areas.

One of these [location PTWL1] is within a patch of diverse native grasses, whereas the others are of moderate to low value due to a higher abundance of Phalaris and wild oats. These areas are mapped as moderate habitat quality by Osborne & Wong [2010].

Refer to **Figure 2** – Ecological Assets of the Outer Asset Protection Zone including potential Pink-tailed Worm Lizard habitat.

Figure 3 provides a copy of the project area studied by Umwelt, the location of the Outer Asset Protection Zone within the urban boundary of Denman Prospect; the Strategic Fire Advantage Zones and the 'Interface Zone' to the west of Denman Prospect.

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Figure 2 - Ecological Assets of the Outer Asset Protection Zone including potential Pink-tailed Worm Lizard habitat – Umwelt Briefing Note 15th October 2013 – Kama and Molonglo 3.

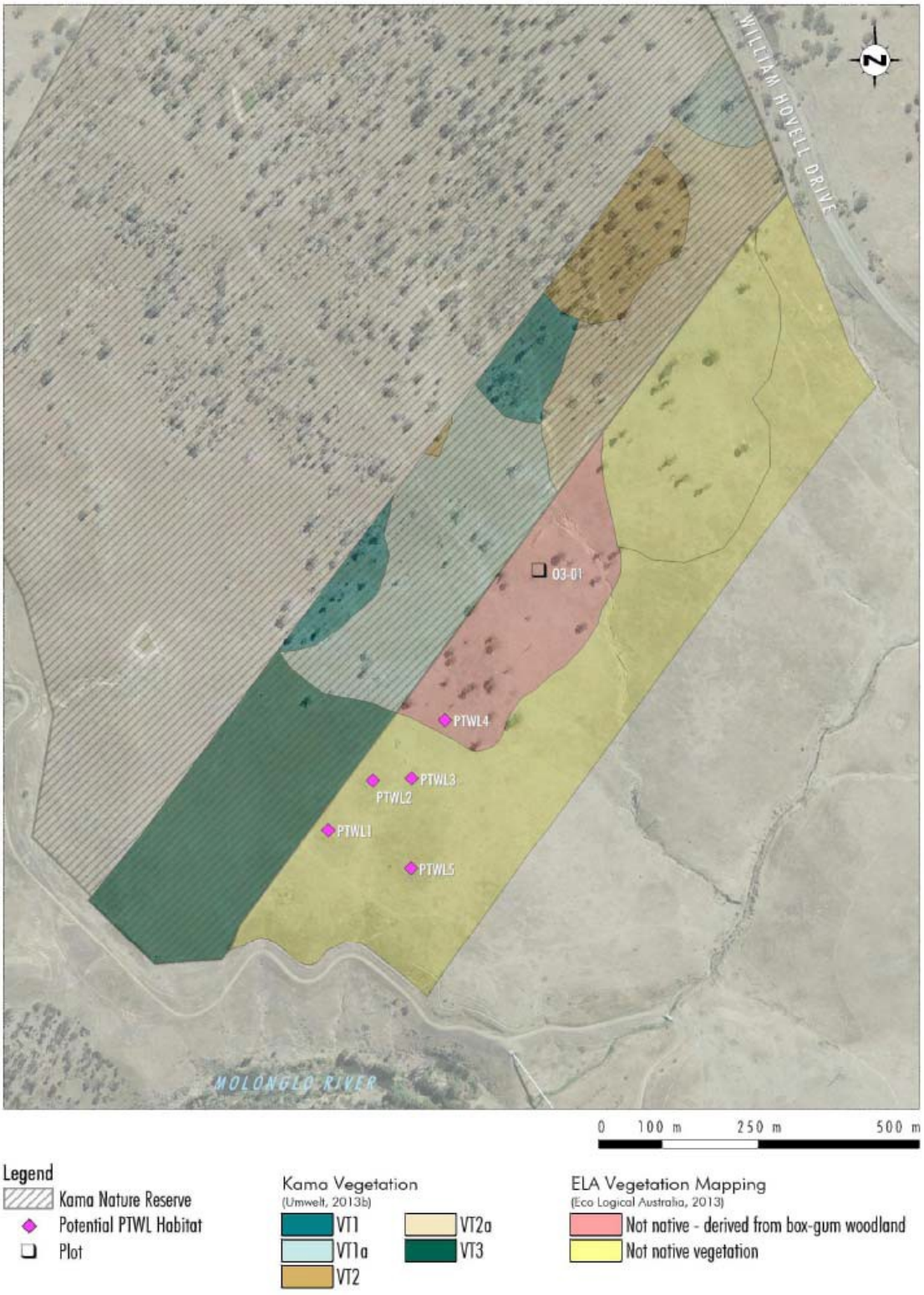

Figure 3.1 - Ecological assets of the outer asset protection zone including potential pink-tailed worm lizard habitat.

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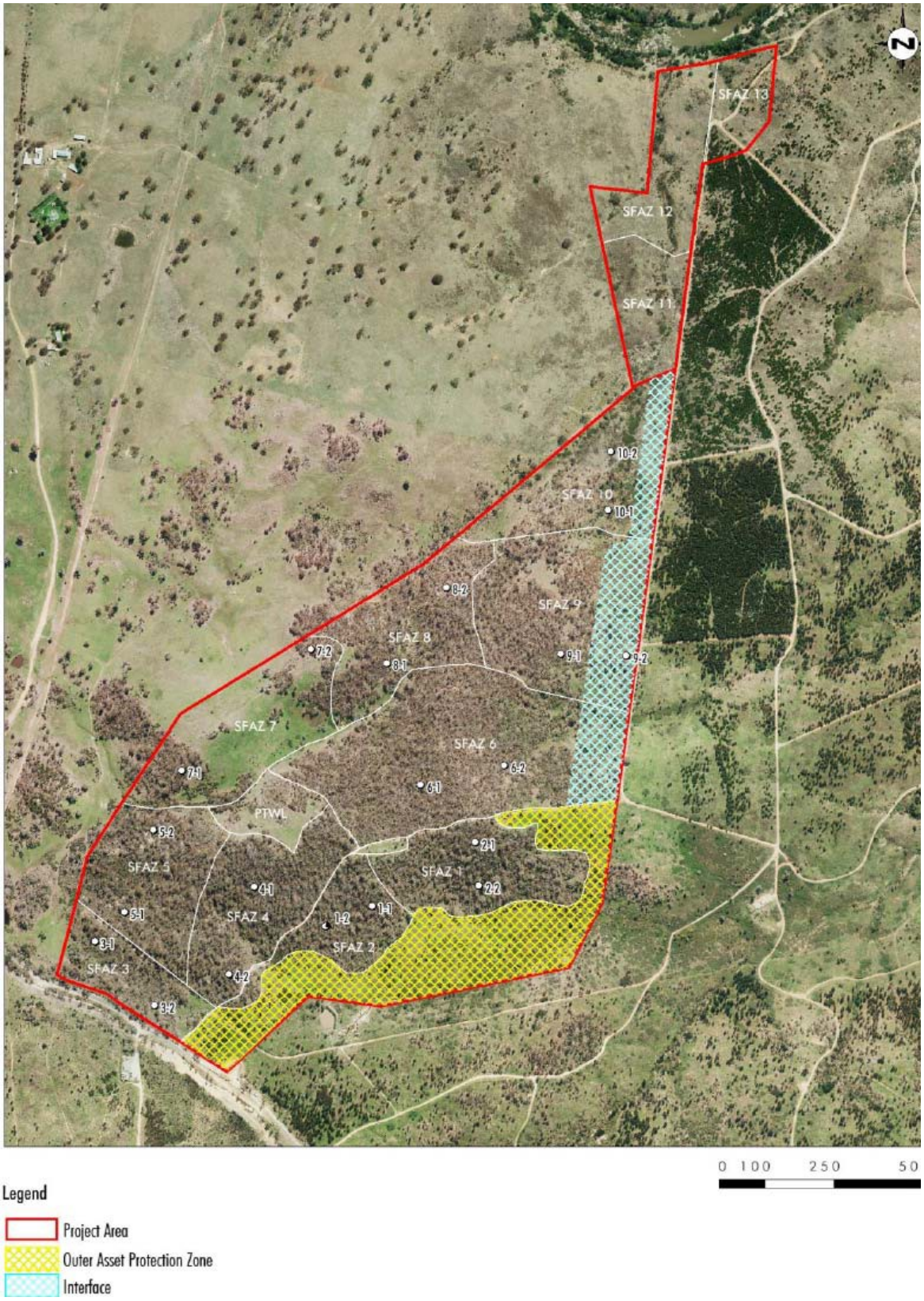
Figure 3 – Plan showing the study area, the location of the Outer Asset Protection Zone; Strategic Fire Advantage Zones and Interface Zone – Denman Prospect, prepared by Umwelt April 2015



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The LDA commissioned Umwelt to undertake an analysis of vegetation values in areas west of Denman Prospect and identify practical solutions to meet joint objectives of fuel hazard management and biodiversity conservation.

A copy of the final report dated April 2015 is at **Attachment B**.

The key messages of the report include:

1. Much of the vegetation within the Project Area is in a regenerating thicket state from the 2003 wildfires;

2. Vegetation in a regenerating thicket state will benefit from active management to promote restoration of the remnant to a state which accelerates the provision of structural diversity important for both fauna and flora diversity. This is demonstrated through discussion of the state and transition model concept;

3. Active management of regenerating thicket vegetation will provide greater opportunity for fire management and suppression, reducing the likelihood of a major fire event compromising biodiversity values in the future;

4. Research outlined in the report suggests that reducing the density of smaller stems that compete strongly for resources leads to greater structural and floristic diversity and subsequent greater conservation values. The use of hazard reduction burning as a tool to achieve this is unlikely to reduce understory vegetation diversity provided burn intervals are set at the lower limits by maturity of smaller plants and non-breeding periods of poorly dispersed or rare birds, and at the upper limits by the longevity of plants which usually required fire as part of the reproductive cycle;

5. Hazard reduction burns in Red Stringybark Dry Sclerophyll Forest within the project area should be initially undertaken in a mosaic every five to ten years. For Box-Gum Woodland burns should not occur in periods of less than 10 years and longer should fuel levels remain naturally low or other fuel management techniques be used.

   Practical implementation of this measure should be done in consultation with ACT Government Conservation Planning and Research officers to determine the most appropriate interval between burns, particularly to each Strategic Fire Advantage Zone [SFAZ];

6. Management should be undertaken with adaptive management principles in mind. This will ensure an iterative process of robust decision making in the face of uncertainty, with uncertainty reduced over time as determined by monitoring;

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7. Hazard reduction burning should be avoided in areas of known Pink-tailed Worm Lizard habitat; if hazard reduction burning occurs this should happen between late winter and mid spring [preferably in August to September].

Section 6 – 'Conclusion' of the Umwelt report provides recommendations for the management of the Strategic Fire Advantage Zones, including by hazard reduction burning; silvicultural thinning; combined approach and the management of areas known to contain Pink-tailed Worm Lizards.

Section 6 also provided recommendations on the management of the Outer Asset Protection Zone, including hazard reduction burning and silviculture within the 'Box-Gum Woodland' along the eastern boundary.

Section 6.3 covers the management of the 'Urban Interface' along the eastern edge of the project area [to the western edge of Denman Prospect]. This zone consists of a 100 metre wide corridor adjacent to the urban interface and is considered to be a primary fire threat to the proposed Denman Prospect development. It also contains natural assets including 'Box-Gum Woodland' in an advanced regeneration state. This vegetation is likely to regenerate into an open forest structure without management.

The report states:

"In order to protect important values within the 'Box-Gum Woodland' area and to mitigate bushfire risk to the adjacent urban development, it is recommended to use silviculture thinning to accelerate an open woodland structure as a primary management tool in this area. This treatment is only required for SFAZ6 and SFAZ 7.

Ongoing management of grassy sward fuel may be required in the event of grassland fire hazard exceeds 35 when grass curing is > 70% [refer to Table 21.5 and Table 21.8 in the ACT Strategic Fire Management Plan – 2014 – Version 3'.

Figure 4 below identifies the maximum 'Overall Fuel Hazard Assessment' ratings for each SFAZ.

Figure 5 on page 19 shows the distribution of Box-Gum Woodland within the Project Area.

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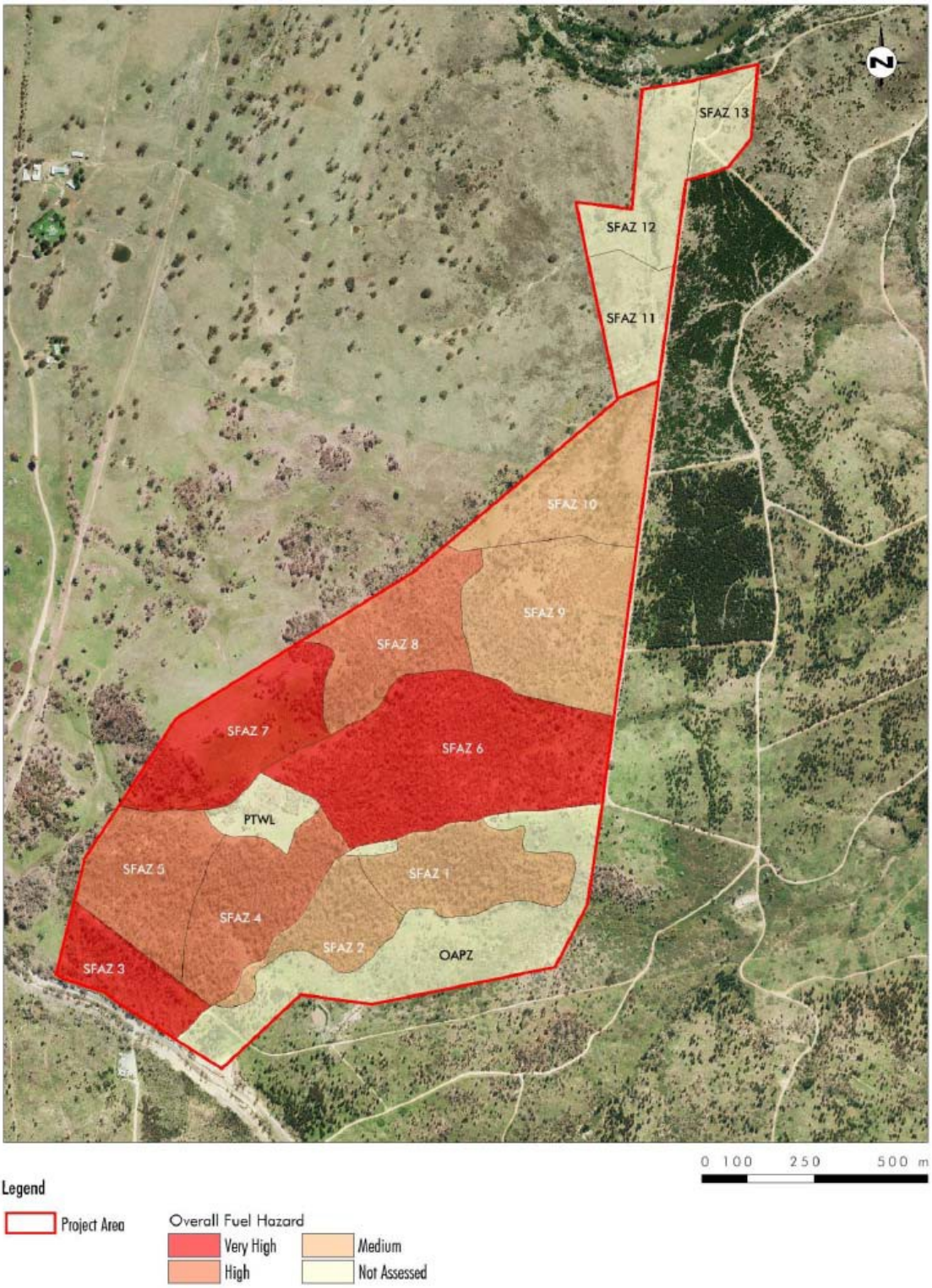
Figure 4 – Denman Prospect maximum 'Overall Fuel Hazard Assessment' ratings for each Strategic Fire Advantage Zone – Umwelt April 2015



Note: due to subjectivity in the assessment method, areas with a 'Medium' hazard may in fact be 'High', or tending to 'High' i the near future as stringybark bark matures, stem charring is reduced and leaf litter accumulates.

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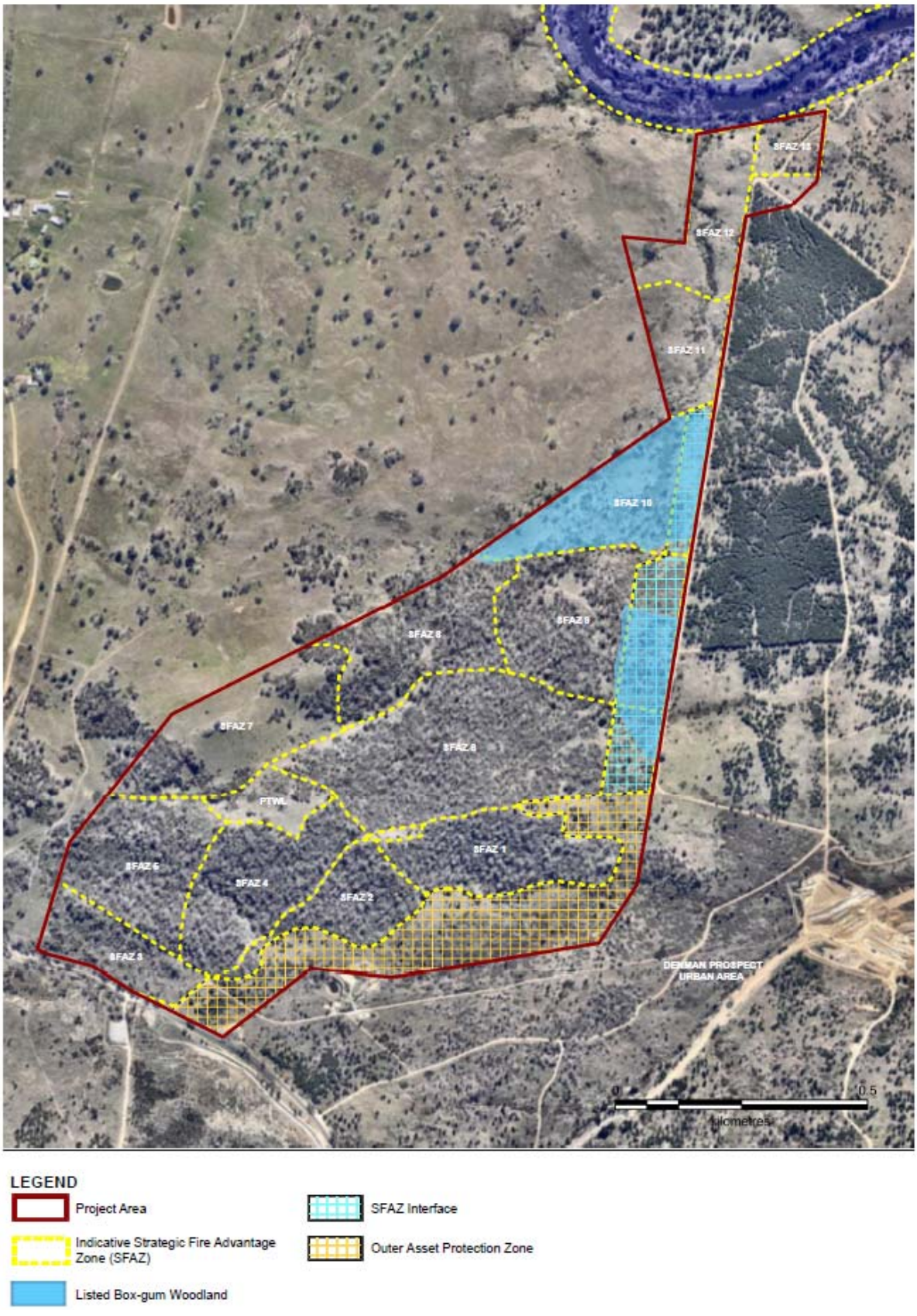
Figure 5 – Denman Prospect distribution of Box-Gum Woodland within the Project Area – Umwelt April 2015



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SECTION 2
BUSHFIRE RISK ASSESSMENT

2.1 Introduction.

The Australian Standard AS/NZS ISO 31000:2009, the ACT Government Enterprise-wide risk management framework and the Emergency Management Australia (EMA) emergency risk management process provide the framework for establishing the context, analysis, evaluation, treatment, monitoring and communication of risk.

Risk has two elements: Likelihood, the chances of a bushfire occurring and consequence, the impact of a bushfire when it occurs.

Bushfire risk is defined as the chance of a bushfire occurring that will have harmful consequences to human communities and the environment. Bushfire risk is usually assessed through consideration of the likelihood of ignition and consequences of a bushfire occurring. Risk reduction can be achieved by reducing the likelihood of a bushfire, the opportunity for a bushfire to spread or the consequence of a bushfire (on natural and built assets).

Bushfire management should have a clear objective to reduce both the likelihood of bushfires and reduce the negative impacts of bushfires. It should also consider the costs, inconvenience and dangers of measures taken to reduce the risk of bushfires.

The consequences of bushfire management activities and the failure to implement programs also need to be considered. A range of factors influence bushfire risk – these include:

- The likelihood of human and natural fire ignitions, as influenced by time, space and demographics;
- The potential spread and severity of a bushfire, as determined by fuel, topography and weather conditions;
- The proximity of assets vulnerable to bushfire fuels, and likely bushfire paths; and
- The vulnerability of assets including natural assets, or their capacity to cope with, and recover from bushfire.

An assessment of bushfire risk must firstly define the problem. This involves the identification of the nature and scope of issues to be addressed and defining the possible boundaries for the assessment *(Emergency Risk Management – Applications Guide. (EMA Echo Press, 2000), and AS/NZS* ISO 31000:2009*).*

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For the purpose of analysing fire risks that might emerge in the ACT, a dangerous and damaging fire has the potential to occur when the following conditions prevail:

- Continuous available fuel – fuel at moisture content sufficiently low to enable rapid combustion, arising from drought effects or the maturing and drying, of grasslands;

- Exposure of vulnerable assets. The 'catchment' for such fires may be within several hundred metres or many (60-70) kilometres from the asset/s;

- A combination of weather conditions that generate a forest or grass fire danger index of Very High (24) or greater. Typically in the ACT, prevailing adverse fire weather will have a strong northerly, through south-westerly wind influence;

- Fire in the landscape not effectively suppressed.

2.2 Risk Assessment.

Australian Bushfire Protection Planners Pty Limited prepared a Bushfire Risk Assessment Report in 2005 for the Molonglo Structure Plan.

The findings of this report, in respect to the bushfire risk, fire paths and potential fire scenarios are applicable for the Molonglo Stage 3, Denman Prospect and the Molonglo River Corridor – refer to Attachment A.

An extract from this report states under 'Summary of Bushfire Risk':

"Major Bushfires have occurred in the Molonglo Valley in 1926, 1939, 1952, 1991, 1994, 2001 and 2003.

The topography and landform of the valley predisposes the valley to impacts of fires burning under north-westerly and westerly wind influences and to a slightly lesser extent, south-westerly wind influences.

The slope of the valley to the north-west and the ridgelines/ gullies will influence the spread of fire from the northwest, west and south west and result in sporadic fire runs.

Fuel loads within the retained Habitat Corridors and Parklands, Nature Reserves and Lease Holdings, unless managed, will promulgate future bushfires up to the urban edge and into the vegetated corridors within the urban precinct.

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Whilst the Overall Fuel Hazard for the vegetation within the valley is Very High there is, due to the fire history, topography, aspect, wind influence and climatic conditions within the valley, an extreme risk of damaging bushfires impacting the north western edge of the East Precinct [Molonglo Stage 3 and Denman Prospect].

The 'Conclusion' of the 2005 Bushfire Risk Assessment Report stated:

"The orientation of the Molonglo Valley and the ability for northwest, west and south-west wind-driven fires to impact the proposed development edge will continue the extreme level of risk to any development proposed in the valley with the potential to cause major damage to buildings and infrastructure.

Subsequent to the preparation of the original Bushfire Risk Assessment Report [19.7.2005] an updated report was prepared by ABPP, dated 26.4.2006. The Executive Summary of this report stated:

The Molonglo Stage 2 Bushfire Risk Assessment quantifies the current level of risk to future development within the Molonglo Valley, prior to the implementation of mitigation measures as ***Extreme.***

Mitigation measures which have been identified within the report as necessary to reduce the level of potential risk to future development include the creation and permanent management of a Critical Management Zone to the north- western edge of the East Molonglo Precinct and to the western and south- western edge of the Central Molonglo Precinct.

The provision of the Critical Management Zone (CMZ) replaces the Outer Asset Protection Zone, as defined in the Strategic Bushfire Management Plan for the ACT and the management of this zone, in accordance with the performance standards defined in this report, are considered to be a mandatory requirement in the reduction of the bushfire risk to the future development within the Molonglo Valley.

In addition to the provision of a Critical Management Zone to the north-western edge of East Molonglo Precinct, this report recommends, due to the risk of fire over-run along the Molonglo River corridor and into the future suburb, the damming of the Molonglo River below Coppins Crossing and the creation of Lake Molonglo".

This recommendation was not adopted in the final Molonglo Structure Plan.

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SECTION 3

PROTECTION MEASURES TO BE IMPLEMENTED TO REDUCE THE BUSHFIRE RISK TO THE NORTH-WESTERN EDGE OF MOLONGLO STAGE 3 & DENMAN PROSPECT AND THE MOLONGLO RIVER CORRIDOR.

3.1 Introduction.

The primary purpose of the LDA established Working Group was to establish solutions to the problem of providing bushfire protection measures to the north-western edge of Molonglo Stage 3 and Denman Prospect and to the Molonglo River Corridor which would not only mitigate the bushfire risk but also be acceptable to ACT Government Agencies.

The solutions also had to be achievable, ecologically and economically sustainable and able to be funded in the long term – in perpetuity.

Consideration was also given to the 'alternate solutions' provided by the updated ACT Strategic Bushfire Management Plan – Version 3, particularly in respect to the ability to increase the width of the Inner Asset Protection Zone so as to remove the need to provide and manage an Outer Asset Protection Zone on ecologically sensitive land.

Having considered the total removal of the Outer Asset Protection Zone and the potential for catastrophic bushfire events to impact the north-western edge of Molonglo Stage 3 and Denman Prospect and development adjacent to the Molonglo River corridor, the Working Group has adopted a policy of implementing a bushfire protection zone to future development. This contains an Inner Asset Protection Zone supported on the outside by a Strategic Fire Advantage Zone [SFAZ] within Kama to the northwest of Molonglo Stage 3 as well as within the land to the northwest and west of Denman Prospect and broadly within the Molonglo River Park.

The study undertaken by Umwelt, in concert with TaMS Fire Management Unit (FMU) has formed the basis upon which the decision has been taken to implement the establishment of a SFAZ within Kama Nature Reserve. It is noted that consensus has been reached that the performance criteria of a SFAZ, as required by the ACT Strategic Bushfire Management Plan – 2014 – Version 3 can be achieved whilst maintaining the ecological biodiversity of the reserve.

Similarly, the study undertaken by Umwelt, in concert with TaMS FMU has formed the basis upon which the decision has been taken to implement the establishment of a SFAZ on the land to the northwest and west of Denman Prospect – refer to Attachment B – Analysis of Vegetation Structure and Fire Risk.

Discussions with TaMS FMU and the need to manage the vegetation within the Molonglo River corridor to mitigate the spread of fire have also formed the basis upon which the establishment of the SFAZ has been recommended within the Molonglo River Park.

This report also recommends the inclusion of the community facility located at the former Sludge Ponds and the western end of the River Park as detailed in the Molonglo River Park Concept Plan prepared by Hassell.

For completeness, this report also provides recommendations on the bushfire protection zones to the northern and eastern edge of Molonglo Stage 3.

The SBMP Version 3 highlights the need on rural land inside the Bushfire Abatement Zone for the development of property-level fire management plans under the Farm Firewise Program, the legislative requirements for the development and approval of a bushfire operational plan (BOP) under the Emergencies Act 2004. The BOPs are to be reviewed every 5 years.

It calls for undertaking a planned, whole-of-property approach to reduce the risk of bushfire in addition to considering the risk of fires starting and spreading. Through this approach, identified actions should:

- Complement activities undertaken on adjacent rural or government-managed lands;
- Consider safety as a priority, as well as environmental and legal issues, and long-term sustainability;
- Consider bushfire recovery.

Property level fire management plans developed under the Farm Firewise Program will meet the requirements for BOPs according to the SBMP Version 3.

The SBMP Version 3 also highlighted the Broad area bushfire fuel reduction across the natural and rural landscape through the use of Strategic Firefighting Advantage Zones (SFAZs). These have the objective of reducing the intensity and spread of fires across large landscape units contributing to the success of firefighting under moderate weather conditions and reducing impacts of unplanned fires on catchment values.

In these areas, specific actions amongst others include:

- Land managers preparing BOPs that detail fuel management works in SFAZs to meet the standards in the ACT Bushfire Management Standards with the BOPs audited and assessed to ensure compliance;
- The implementation of landscape fuel management treatments will be reported on a cumulative basis;
- The location and timing of fuel reduction activities in SFAZs for the period 2019-24 will be developed.

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The ESA and TaMS measure the IAPZ width from the back of kerb on the block side to the IAPZ/SFAZ interface where an edge road is provided. The LDA on the other hand measures the width to the block boundary which is easy to define on the ground whereas roads and road verges can be of variable widths and variable distances from the block boundaries.

Note that TaMS does not consider the road verge on the block side of an edge road in the IAPZ to be part of its management responsibility. Note however, that lessees are not responsible for the management of road verges as they are unleased Territory land. Hence, for example, a 60m IAPZ from the ACT Bushfire Management Standards measured to the back of kerb would result in a total distance of 67 to 70m to the block boundary.

The LDA through discussion in the Working Group received support from the ESA for consideration of a 50m IAPZ (measured from back of kerb where an edge road will be provided). Taking this one step further, a 50m IAPZ to the back of kerb would result in a total width of 57 to 60m to the block boundary.

The reference to an IAPZ width of 60m in the remaining parts of this document is the ESA suggested 50m plus 7.5 to 10m of verge to the block boundary.

Plans outlining the urban edge outcomes are at **Attachment C**. Note that they contain an aerial photograph image including contours and the agreed position of the urban edge boundary.

Refer to **Figure 6** on page 29 for locations of the mitigation measures.

The following section details the Working Groups' recommendations.

3.2. North-western edge to Molonglo Stage 3:

1) There shall be established and maintained a minimum 60.0 metre wide Inner Asset Protection Zone to the north-western edge of the urban development, managed to the prescriptions as detailed in the ACT Strategic Fire Management Plan 2014 – Version 3. This zone shall contain an edge road and also a gravel fire trail located adjacent to the eastern boundary of Kama and shall include stormwater treatment ponds, cycleway/pedestrian access and electrical power lines, as required.

2) There shall be established and maintained, over the whole of Kama Nature Reserve, a Strategic Fire Advantage Zone, cyclically managed to the prescriptions as detailed in the ACT Strategic Fire Management Plan 2014 – Version 3;

3) There shall be established and maintained a six [6] metre wide fire break located inside the eastern boundary of Kama Nature Reserve;

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4) The existing access/fire trails within Kama Nature Reserve shall be upgraded and maintained to provide access for management works and fire-fighting operations.

3.3 North-western/Western edge to Denman Prospect:

1) There shall be established and maintained a minimum 60.0 metre wide Inner Asset Protection Zone to the north-western and western edge of the urban development within Denman Prospect, managed to the prescriptions as detailed in the ACT Strategic Fire Management Plan 2014 – Version 3. This zone shall include an edge road and where provided, stormwater treatment ponds and shall also include cycleway/ pedestrian access as required – refer to Denman Prospect **Figure 6** on Page 29.

2) There shall be established and maintained, to the location as shown on **Figure 6** on Page 29, an Outer Asset Protection Zone of varying widths, managed to the prescriptions as detailed in the ACT Strategic Fire Management Plan 2014 – Version 3;

3) There shall be established and maintained to the area as shown on **Figure 6** on Page 29, a series of Strategic Fire Advantage Zones, cyclically managed to the prescriptions as detailed in the ACT Strategic Fire Management Plan 2014 – Version 3 and in accordance with the recommendations contained in the *Analysis of Vegetation Structure and Fire Risk* report prepared by Umwelt - 2015;

4) There shall be established a series of Fire Trails, generally as located as shown on **Figure 6** on Page 29 – also refer to the *Analysis of Vegetation Structure and Fire Risk* report prepared by Umwelt - 2015.

These trails shall be maintained to provide access for management works and fire-fighting operations.

3.4 Molonglo River Park:

1) There shall be established and maintained a minimum 60.0 metre wide Inner Asset Protection Zone to the north and south of the Molonglo River Park, to the extent detailed on **Figure 6** on Page 29, managed to the prescriptions as detailed in the ACT Strategic Fire Management Plan 2014 – Version 3. This zone shall include an edge road and where provided the managed easement for services [sewer / water / electricity], stormwater treatment ponds and shall also include cycleway/pedestrian access as required.

Note on the south side of the river the locations of the IAPZs will be determined at the EDP stages.

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2) There shall be established and maintained, to the area as shown on **Figure 6** on Page 29, a series of Strategic Fire Advantage Zones, cyclically managed to the prescriptions as detailed in the ACT Strategic Fire Management Plan 2014 – Version 3.

Note on the south side of the river, the locations of the SFAZs will be determined at the EDP stages.

3) There shall be provided, to the locations as shown on **Figure 6** on Page 29, a Landscape Fire Management Zone of varying width to each side of the Molonglo River.

Fuel management standards do not apply to this zone;

4) The existing fire trail/access roads within the river corridor shall be maintained to provide access for management works and fire-fighting operations.

5) There shall be established and maintained access for management works and fire-fighting operations within the Group Centre precinct.

6) The recommendations provided in the Molonglo River Concept Plan report prepared by Hassell, in respect to the establishment of a community facility in the location of the Sludge Ponds and the western end of the Molonglo River Park shall be included in the Park Management Plan.

3.5 Molonglo Stage 3 – Northern and Eastern Edges:

1) To the northern edge of the Molonglo Stage 3 precinct the full width of the William Hovell Drive carriageway shall be maintained as an Inner Asset Protection Zone, managed to the prescriptions as detailed in the ACT Strategic Fire Management Plan 2014 – Version 3;

2) To the eastern edge of the Molonglo Stage 3 precinct, adjacent to the National Arboretum, there shall be provided an Inner Asset Protection Zone having a minimum width of 40 metres, managed to the prescriptions as detailed in the ACT Strategic Fire Management Plan 2014 – Version 3. This zone shall include an edge road and where provided, the managed easement for services [sewer/water/electricity], stormwater treatment ponds and shall also include cycleway/pedestrian access as required.

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3.6 Bushfire Construction Standards to Buildings.

Except for the future buildings within Denman Prospect, all buildings located within 100 metres of land that is subject to, or likely to be subject to, bushfire attack [bushfire prone land] shall be constructed to comply with the standards required by Australian Standard A.S. 3959 – 2009 – *'Construction of Buildings in Bushfire Prone Areas'.*

Note: Refer to the ACT Strategic Bushfire Management Plan for the location of Bushfire Prone Land.

The minimum level of construction for buildings located adjacent to the Inner Asset Protection Zone shall be BAL 29 for the first row of houses adjacent to the IAPZ. The minimum construction standard of all other buildings located within 100 metres of bushfire prone land shall be BAL 12.5.

For Denman Prospect, all buildings located within 400 metres of the forest/woodland vegetation on the land to the northwest and west of Denman Prospect shall be constructed to comply with the standards required by Australian Standard A.S. 3959 – 2009 – *'Construction of Buildings in Bushfire Prone Areas'.* The minimum level of construction for buildings located adjacent to the Inner Asset Protection Zone shall be BAL 29 for the first row of houses adjacent to the IAPZ. The minimum construction standard of all other buildings located within 400 metres of bushfire prone land shall be BAL 12.5.

For buildings adjacent to the IAPZ along the Molonglo River corridor, the BAL levels will be confirmed at the time of the EDPs. As a guide until that occurs, it is expected that the minimum BAL levels will be BAL 12.5 with a possible maximum of BAL 29. The distance that the application of BAL levels will apply into each estate will also be determined at the same time.

3.7 Support Infrastructure.

3.7.1 Access for fire-fighting Operations:

Edge roads shall be designed to comply with the access code for heavy rigid and articulated vehicles and the ACT Bushfire Management Standards under SBMP Version 3.

3.7.2 Water Supplies for Fire Fighting Operations:

A fire-fighting water supply shall be installed to comply with F4 and the standards agreed by ACTEW and ACT Fire & Rescue.

Type F5 standard 45 l/s single hydrants at 60 metre intervals shall be installed within the Edge Road.

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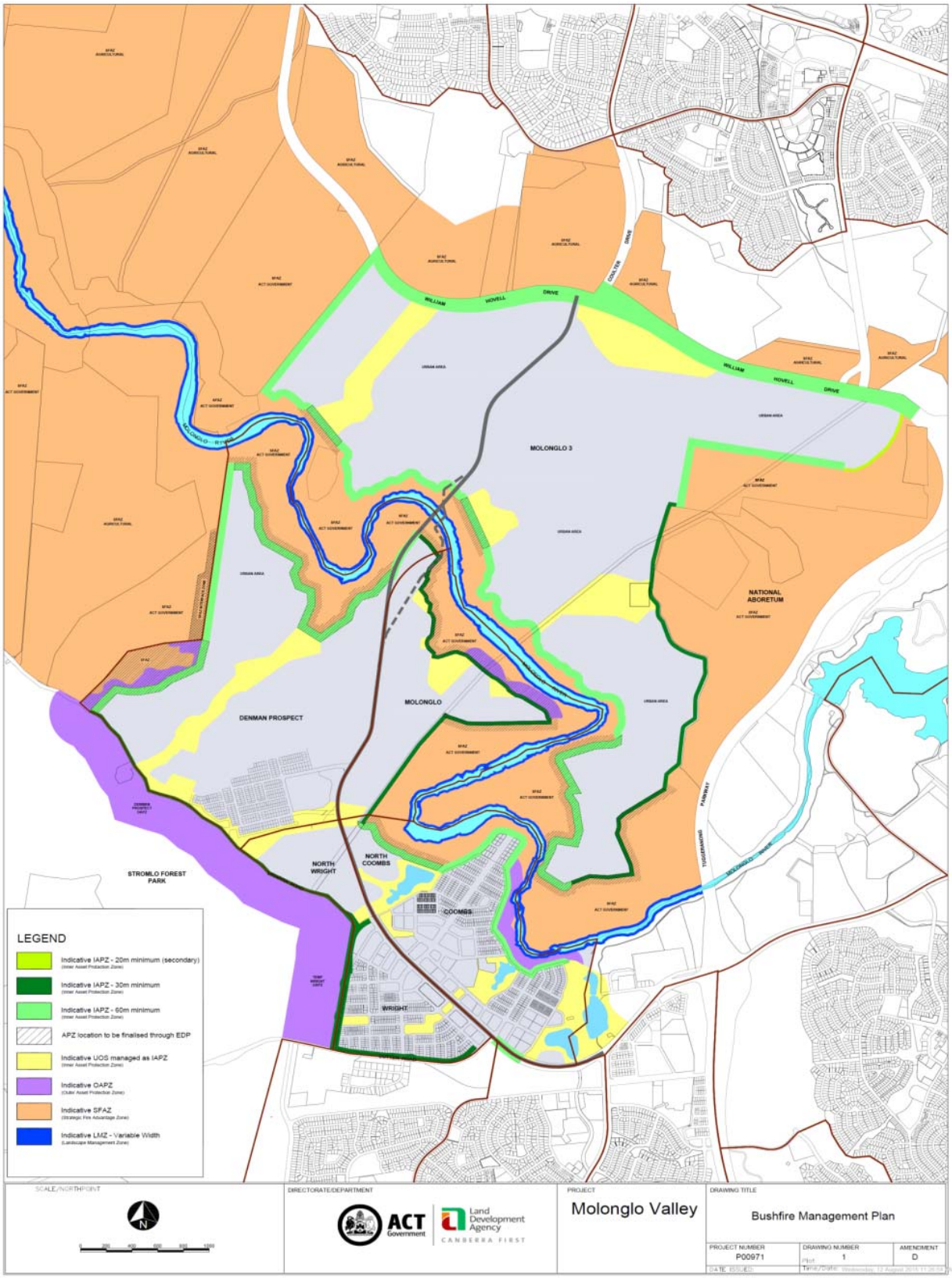
Figure 6 – Bushfire Risk Strategy showing Management Outcomes



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SECTION 4

FUNDING FOR BUSHFIRE MANAGEMENT WORKS

4.1 General

Residential and infrastructure development in the Molonglo Valley is proceeding in accordance with the Government's Indicative Land Release Programs and associated budget appropriations for capital works funding to support land release.

Subdivision construction is continuing in Molonglo Stage 1 (Coombs) over the life of the Program with the first releases in Molonglo Stage 2 (Denman Prospect) in 2014-15. Molonglo Stage 3 on the north side of the Molonglo River is programmed to commence in 2018-19.

The LDA/EDD are undertaking due diligence assessment investigations based on the approved Molonglo Valley Structure Plan and other documentation across a range of significant issues in Molonglo Stage 2 and Stage 3 including but not limited to ecological, contamination, infrastructure provision, UXO and bushfire risk. These assessments, especially bushfire in conjunction with TaMS, can materially influence the location of land use boundaries due to impacts and responsibilities for cost efficient land management.

The TaMS has a management parameter to manage all the Government's assets. This includes managing the ever increasing asset base such as new roads, urban open space associated with Greenfield development.

Bushfire risk and the associated mitigation measures can have a significant impact on ecological, economic and social parameters. Since the 2003 Canberra bushfire, there has been a significant shift in the increase of the awareness and delivery of bushfire mitigation measures across Government. This commenced immediately after the bushfire with changes to subdivision design and the introduction of edge roads and specific controls within asset protection zones both within the urban area and outside it. This in turn has led to revisions of standards, guidelines, expectations and responsibilities both public and private.

It has also increased the responsibility of TaMS to manage a large proportion of the asset protection zones possibly to higher standards than was necessary before the bushfire.

4.2 Typical Cross Section of Zones at the Urban/Non-urban Interface.

A typical cross section at the urban/non-urban interface today would include:

- House asset protection zone – extending from the front of the residential block boundary into the suburb for distances up to 100m or more depending on risk and mitigating against ember attack.

- This requires housing design and construction (and landscaping) to meet specific Bushfire Attack Levels (BALs) under the Australian Standard. Management of this area lies partly with TaMS (public open space and roads including verges) and individual block owners.

- Inner asset protection zone – extends from the front of the residential block boundary to the edge of the urban/non-urban interface. Distances vary depending on risk and management requirements. A usual width would be a minimum of 30 to 40m and include significant infrastructure such as subdivision edge road, fire trail, stock proof fencing at the urban/non-urban interface, stormwater cut-off drains, hydraulic services for fire fighting, and street trees on the block side of the edge road. Management includes control of fuel loads by slashing. Management of this area lies with TaMS.

- Outer asset protection zone or Strategic fire fighting advantage zone – extends into the non-urban area for some distance depending on risk and management requirements. These could be 100m to around 300m in width and contain fire trails to aid management. Management methods depend on fuel loads and may include thinning of existing inappropriate vegetation, weed management, grazing or other ecological controls that ensures fuel loads are not exceeded during the fire season. Management of this area lies with TaMS and may be on a private lease.

4.3 Current Process of Conversion of Rural Land to Urban Land.

The development/management process that transforms rural land to urban land is typically set out below:

- Rural land and Canberra Nature Parks including Nature Reserves are managed by TaMS as the land custodian.

- LDA/EDD undertakes due diligence assessments to gain necessary approvals to clear the way to proceed to preparation of individual Estate Development Plans (EDPs) and gain budget approvals for the delivery of infrastructure associated with land delivery.

- LDA/EDD prepares EDP and capital works program. Note capital works may have started ahead of the EDP preparation by as much as a couple of years but may not be required to deliver some items for years after land development and block occupation is complete - i.e. staged infrastructure.

- Land custodianship transferred from TaMS to LDA usually prior to lodging EDP for approval.

- EDP lodged for final circulation and approval as a DA. Note EDP usually contains site specific Bushfire risk assessment.

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Note however that in the case of Molonglo Stages 2 and 3, the western edge and river corridor bushfire risk assessment is designed to cover the whole of the remaining development. In the meantime detailed design has commenced and readied for submitting to TaMS for design approval.

- DA approved by EPD followed by design approval by TaMS.
- Construction commences and includes the provision of bushfire mitigation measures.
- Blocks sold by the LDA but settlement is delayed until after consolidation is complete.
- Construction finishes and consolidation period commences.
- Consolidation period ends.
- Blocks in private ownership after settlement.
- Other areas handed back to Government (usually TaMS) for continuation of approved management including bushfire risk mitigation measures and management of public open space, roads and other land.
- TaMS prepares budget bids to maintain management on a year-by-year basis within the constraints of the ACT Government budget parameters.

4.4 Requirements for the Current Process.

There are a number of requirements for the current process to be considered. In the case of development in the Molonglo Valley, these include:

- There is a need for a whole-of-Government outcome for the delivery of Molonglo 2 and 3 and the Molonglo River Corridor.
- A solution would be where the initial funding is provided by the LDA or a private developer for a period associated with construction timing for the implementation of management regimes but with a sunset clause specifying when TaMS would be required to take over responsibility which includes funding.

  For example, LDA or a private developer could construct and implement bushfire mitigation management regimes while land development is proceeding generally adjacent to the non-urban edge. The issue is how long a time period would LDA or a private developer be practically required to fund and manage such an arrangement and when TaMS would be expected to take over. While this could be a set period of time, there is an issue when or if there is a slowdown in the private sector development or there is a reduction in the demand for new housing. This could mean that the LDA or a private developer would need to be involved for a longer period of time.

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- The requirement of bushfire mitigation management measures is not restricted to the Molonglo Valley. It encompasses on- going management at the edges of all development areas at the interface with the rural or broadacre land use zones in Canberra. As the urban area expands, so too does the bushfire mitigation management issue thus requiring increases in funding.

4.5 Funding Options.

A number of funding options were discussed in the preparation of this assessment.

However, it was agreed the existing arrangements met the overall strategies and objectives of Government.

It does allow the guarantee of prioritising critical management to protect residents and assets from bushfire risk on a season by season basis.

However, there is a distinct risk that the subsequent year or years may require extra funding which may have to be guaranteed by Treasury regardless ahead of the normal yearly budget consideration.

As part of the guarantee mentioned above, a solution may be that Treasury may require, at a minimum, an agreed rolling bushfire mitigation management document for say a 5 year period to plan ahead for Budget predictions. This may allow for expenditure variations such as changing seasonal needs and the reaction to catastrophic events. This could be "signed off" by the responsible directorate after agreement at Directors-General level and Treasury. Such a recommendation is not included in this document.

After consultation with other members of the Working Group, it was agreed that the existing funding arrangements based on annual budget bids to Treasury would continue to be the method to fund recurrent bushfire risk mitigation work.

These arrangements do not stop the consideration of the possibility of adding the 'flexibility' mentioned above to the existing funding methodology.

4.6 Costs

In line with the discussion in this chapter, the LDA would expect to put in place and fund bushfire mitigation measures including management regimes while land development is proceeding. This includes:

- The use and management of temporary asset protection zones while stages of estates are gradually advancing to the final edge of development;
- The development of the IAPZs, OAPZs and more recently, SFAZs to the point of handover to TaMS for continued management after asset acceptance; and

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- OAPZs on privately leased land such as at Bonner in Gungahlin where on-going management is required to be undertaken by the lessee in accordance with a Land Management Agreement after asset acceptance.

In the case of Molonglo Stage 3 western edge, the LDA, or a developer in the case of an englobo sale, will put in place and fund the development infrastructure associated within the IAPZ adjacent to Kama Nature Reserve. This will include to the requirements of the ACT Bushfire Management Standards:

- The public edge road to the estates;
- Fire trails along the entire western edge of the development areas with connection to Kama;
- Utility services infrastructure including water supply for fire-fighting purposes;
- Storm water cut-off drains;
- Fencing the IAPZ at the outer edge of the zone including gates to the Kama boundary;
- Establishing and initially managing the IAPZ to the required fuel management standards;
- Providing opportunities for the location of other infrastructure services as required.

Once the estates are accepted at asset acceptance stage, the entire IAPZ will become the management responsibility of TaMS including securing recurrent funding.

In the case of Denman Prospect at the western edge of Molonglo Stage 2, the LDA, or a developer in the case of an englobo sale, will put in place and fund the development infrastructure associated within the IAPZ, the OAPZ and the SFAZs adjacent to suburb boundary. This will include, to the requirements of the ACT Bushfire Management Standards:

- The public edge road to the estates;
- Fire trails along the entire western edge of the development areas with connection to area to the west;
- Utility services infrastructure including water supply for fire-fighting purposes;
- Storm water cut-off drains;
- Fencing the suburb boundary including gates to the western edge;
- Establishing and initially managing the IAPZ, OAPZ and SFAZs to the required fuel management standards;
- Providing opportunities for the location of other infrastructure services as required.

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Once the estates are accepted at asset acceptance stage, the entire IAPZ, OAPZ and SFAZs will become the management responsibility of TaMS including securing recurrent funding.

In the case of Kama Nature Reserve, the area is being managed already to the standard required for an SFAZ and this has been occurring for a number of years and is acknowledged on the ESA website. The LDA, or a developer in the case of an englobo sale for the land opposite Kama, will fund the initial upgrading of firetrails within Kama Nature Reserve to the satisfaction of TaMS Fire Management Unit. The responsibility for other management within Kama remains with TaMS.

In the case of Denman Prospect, the area immediately to the west of the suburb boundary, on TaMS land, has been assessed as being capable of being managed as a series of SFAZs. Here the LDA or a developer, in the case of an englobo sale, will assist TaMS in setting up the SFAZs by funding for a two year period their initial development to the requirements of the ACT Bushfire Management Standards. This is expected to include:

- Fire trails around and separating each of the SFAZs;
- Establishing the initial management of the SFAZs.

After that period of time, the ongoing management of the SFAZs will pass to TaMS including recurrent funding.

4.7 Costs of Implementing the 60m IAPZ

The LDA has investigated the costs of setting blocks back from the edge of Kama Nature Reserve and the western edge of Denman Prospect in order to comply with the Strategic Bushfire Management Plan version 3 where OAPZs are not supported in the non-urban land.

In order to identify the quantum of costs associated with implementing the bushfire risk strategy recommendations, the LDA engaged Coleman Engineering Services. The investigation specifically targeted the bushfire mitigation measures and developing urban infrastructure along the boundaries of Kama Nature Reserve and the suburb of Denman Prospect over and above the costs to service other comparable subdivisions in the ACT but keeping in mind the requirements of version 3 of the Strategic Bushfire Management Plan and the associated standards.

This latter point is important to note because the standards allowable for IAPZs have been revised to reflect the combinations of IAPZs, OAPZs and SFAZs now considered acceptable by the ESA but point out that the applications of the zones require approval by the ESA in each circumstance.

Also, it should be noted that ESA expects individual land managers to manage their land for bushfire management.

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The use of SFAZs does allow the management for biodiversity to be protected where other APZs would not meet that requirement.

For example, for an IAPZ in combination with an OAPZ on a primary interface for forest and woodland, the respective widths should be 30m and a minimum of 200m (target 300m). Where an OAPZ is not achievable, such as within a nature reserve, the IAPZ should be widened to 60m to compensate.

In the case of Molonglo, Kama Nature Reserve is already managed as an SFAZ or multiple SFAZs and it is the intention that the area to the west of Denman Prospect also be managed as a series of SFAZs.

Section 8 of the Coleman report sets out the likely establishment and recurrent costs to put in place the IAPZ and the SFAZs along the western edge of Denman Prospect and adjacent to and within Kama Nature Reserve. The following summary encapsulates those expected indicative costs.

Note that the summary has adjusted the costs in the Coleman report to take account of items not normally provided, for example in the development of fire trails such as removing & stockpiling topsoil and then re-spreading the topsoil towards the end of the project.

North of the Molonglo River:

Inside Kama Nature Reserve (SFAZs):

- Upgrade existing firetrails for TaMS - $24,000.

Outside Kama Nature Reserve (IAPZ):

- Fire trail establishment cost - $420,000
- Fire trail recurrent cost (over 5 years) - $11,000
- Edge road establishment cost - $1,400,000
- IAPZ recurrent cost - $70,400 (over 5 years).

South of the Molonglo River

Outside Denman Prospect (SFAZs):

- Vegetation establishment & management cost (over 2 years) - $2,712,500
- Fire trail establishment & management cost (over 3 years) - $119,000.

Inside Denman Prospect (IAPZ, OAPZ and SFAZ):

- Fire trail establishment cost - $870,000
- Fire trail recurrent cost (over 5 years) - $20,000
- Edge roads establishment cost - $2,900,000
- IAPZ recurrent cost (over 5 years) - $146,200.

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These expected indicative costs will be firmed up during the design stage for the adjacent developments. Note that the costs identified inside Kama Nature Reserve and outside Denman Prospect will be finalised with TaMS Fire Management Unit ahead of estate design so that the measures above can be incrementally implemented in the correct timeframe.

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SECTION 5
CONCLUSION

The bushfire protection measures detailed in Section 3 of this report have been determined by the Working Group with the aim of mitigating the potential bushfire risk to the future development within Molonglo Stage 3, Denman Prospect and the development precincts which adjoin the Molonglo River Park.

However, a level of residual risk will remain as not all of the bushfire threat can be completely removed – only managed to reduce fuel loads.

Another matter that will influence the level of risk reduction, and therefore residual risk, is the commitment for ongoing management of the recommended bushfire protection zones and funding of these works in perpetuity.

Bushfire Operations Plans [BOPs] will be required to be prepared annually, by TaMS, for the works and there will be an expectation that Government will meet the funding requirements to enable the BOPs to be undertaken.

For Molonglo 3, Denman Prospect and the Molonglo River corridor, the initial establishment of the recommended fire protection measures shall be funded by the developer of the land – i.e. LDA or private developer or joint venture partners with LDA for a set period of time.

The initial funding shall be made available for the construction and maintenance of fire trails and fire breaks, the provision of fencing and access gates and initial clearing and establishment of the Asset Protection Zones.

LDA, or the private developer, shall provide initial seed funding to TaMS for hazard reduction and land management activities such as the establishment of the Strategic Fire Advantage Zones.

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21.4.2016

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APPENDIX A – PRECISE OF REPORTS REVIEWED

Bushfire Risk Assessments prepared by ABPP [2005 & 2006]:

Australian Bushfire Protection Planners Pty Limited was commissioned to undertake a study of bushfire risk for the preparation of the Molonglo Structure Plan and produced a Bushfire Risk Assessment, dated 19.07.2005, for the ACT Planning Authority [ACTPLA].

An extract from this report states under 'Summary of Bushfire Risk':

"Major bushfires have occurred in the Molonglo Valley in 1926, 1939, 1952, 1991, 1994, 2001 and 2003.

The topography and landform of the valley predisposes the valley to impacts of fires burning under north-westerly and westerly wind influences and to a slightly lesser extent, south-westerly wind influences.

The slope of the valley to the north-west and the ridgelines/ gullies will influence the spread of fire from the northwest, west and south west and result in sporadic fire runs.

Fuel loads within the retained Habitat Corridors and Parklands, Nature Reserves and Lease Holdings, unless managed, will promulgate future bushfires up to the urban edge and into the vegetated corridors within the urban precinct.

Whilst the Overall Fuel Hazard for the vegetation within the valley is Very High there is, due to the fire history, topography, aspect, wind influence and climatic conditions within the valley, an extreme risk of damaging bushfires impacting the north western, western and south western edges of the West 1 and West 2 Precincts, the north western edge of the East Precinct and a high risk of damaging bushfires impacting the south western edge of the East Precinct".

Figure 12 on Page 41 provides an extract from the Molonglo Concept Plan Bushfire Risk Assessment Report 2005 identifying the Study Area.

Figure 13 on Page 42 provides an extract from the Molonglo Concept Plan Bushfire Risk Assessment Report 2005 identifying the potential north-westerly fire path.

Figure 14 on Page 43 provides an extract from the Molonglo Concept Plan Bushfire Risk Assessment Report 2005 identifying the potential westerly fire Path.

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Figure 12 – Extract from the Molonglo River Structure Plan Bushfire Risk Assessment Report 2005 showing the study areas

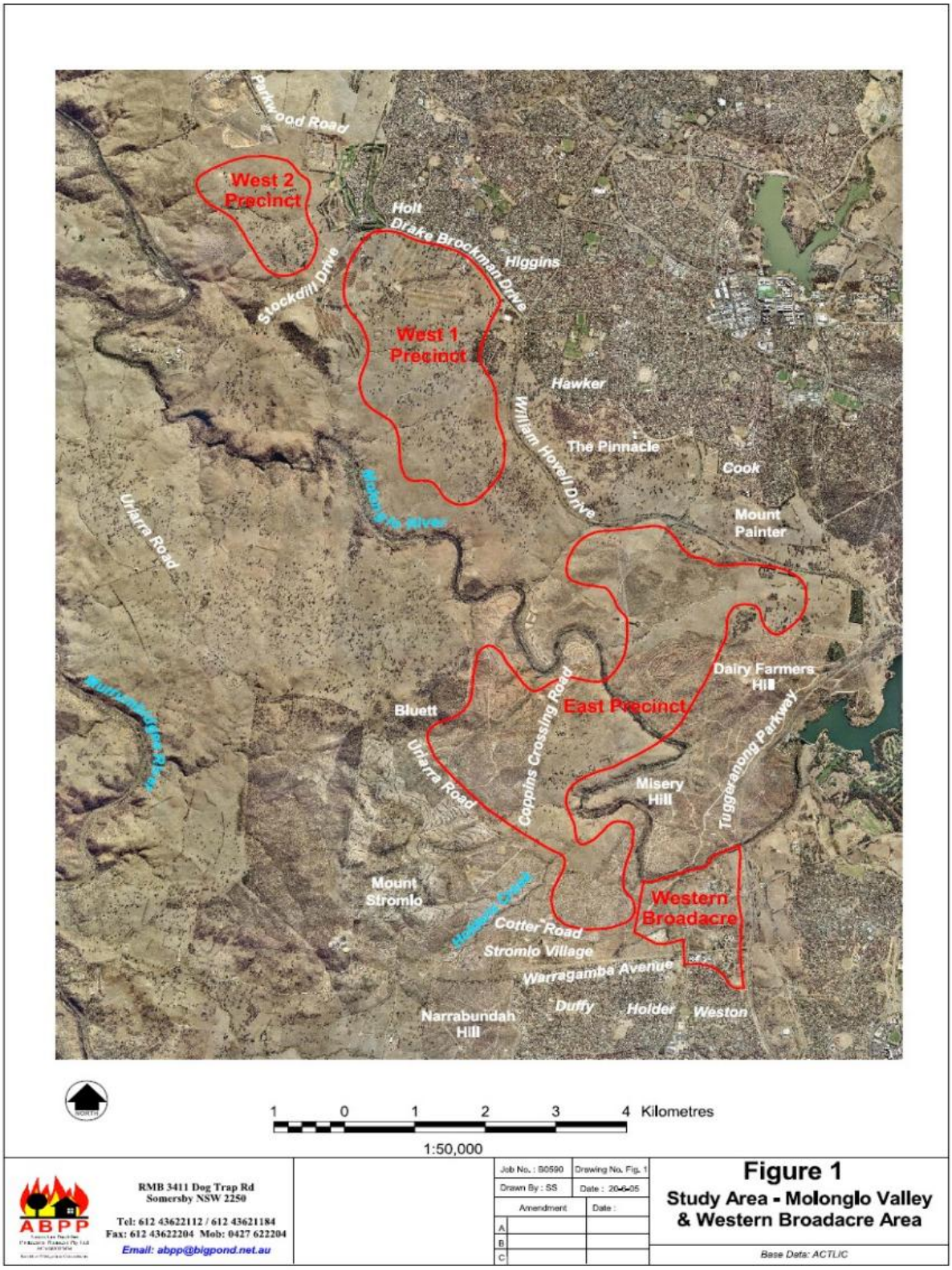


Figure 13 – Extract from the Molonglo River Structure Plan Bushfire Risk Assessment Report 2005 showing the Diagrammatic Northwest fire run

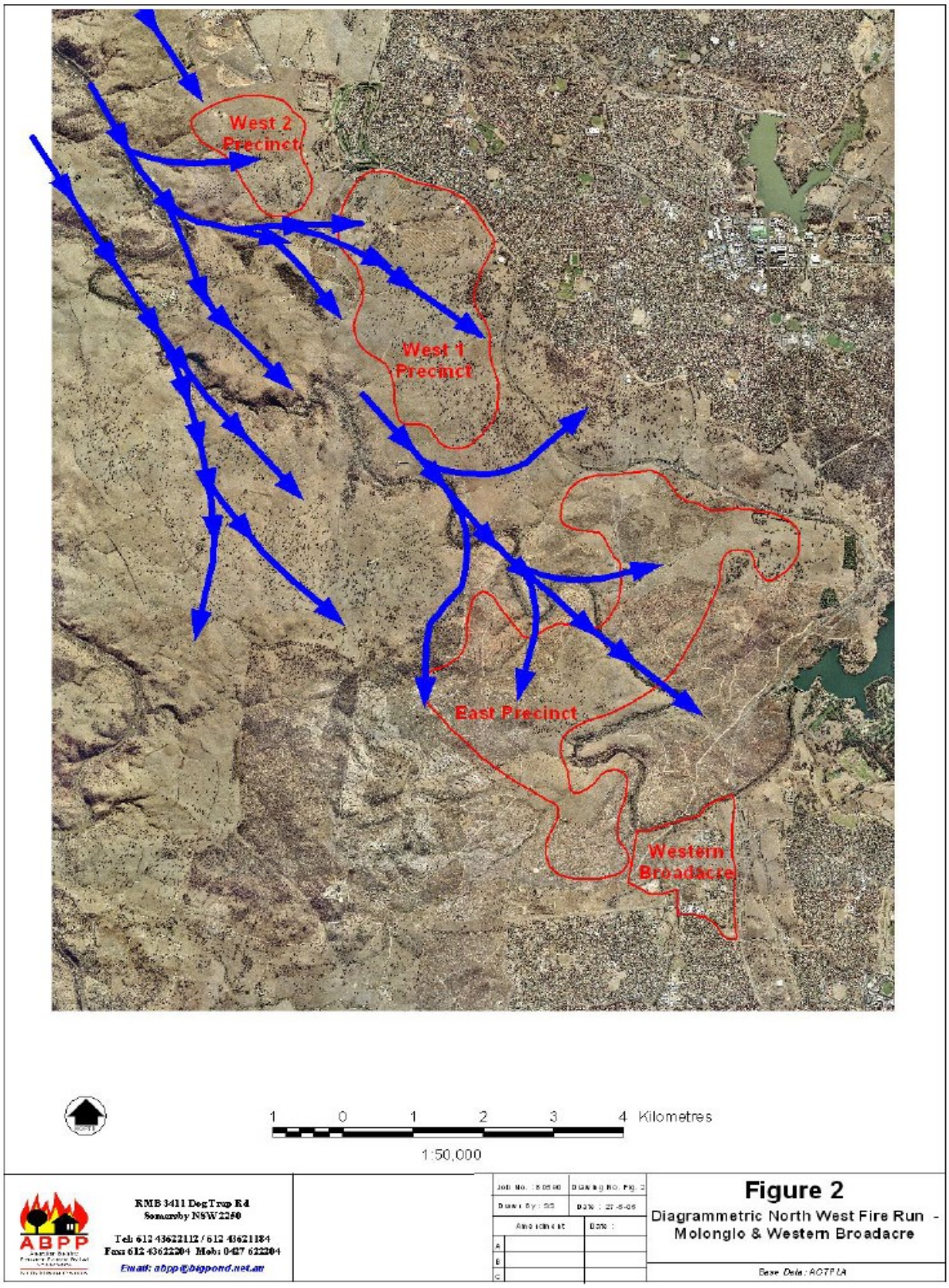
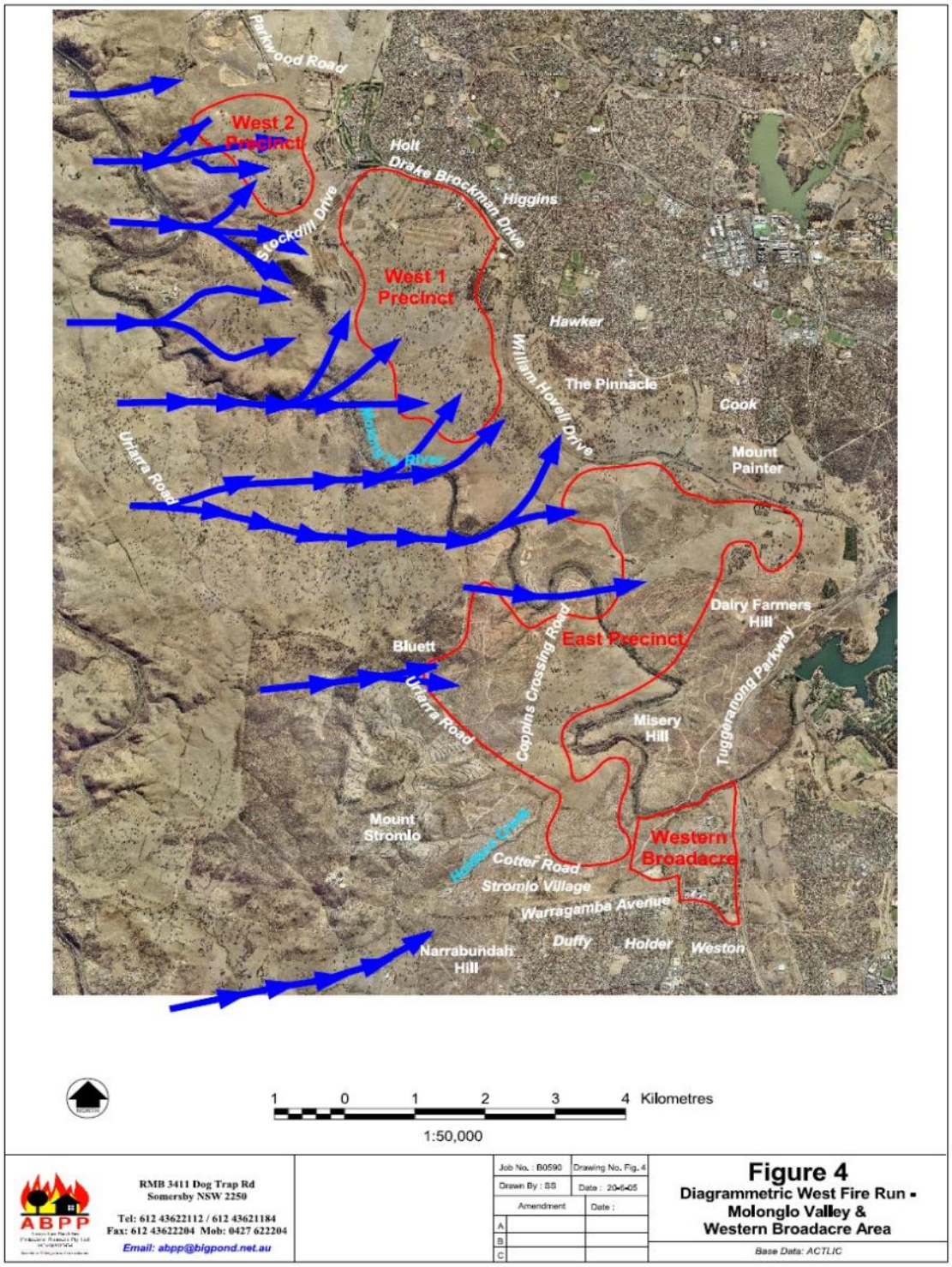


Figure 14 – Extract from the Molonglo River Structure Plan Bushfire Risk Assessment Report 2005 showing the Diagrammatic West fire run



Under Section 6.1 Management of the Vegetation beyond the Urban Interface the ABPP report states:

"The Strategic Bushfire Management Plan for the ACT (Version1) states:

"Under the Emergencies Act 2004 the ESA has declared an area of the ACT to be a Bushfire Abatement Zone. The purpose of the Bushfire Abatement Zone is to reduce the impact of bushfires on the built up areas within the ACT.

Bushfire preparation within the BAZ requires collaborative development of fuel management guidelines and the provision of advice to land managers consistent with land use. Guidelines for bushfire management must achieve a reasonable balance between the increasing community demands on ACT lands for recreation and existing use for farming, forestry and conservation".

"Bushfire fuel hazard is the only factor of bushfire behaviour that can be influenced by land managers and residents. However, fuel management alone is not the panacea for bushfire protection and it ***will not eliminate future severe bushfires.***

"The use of fire in land management requires land managers to make decisions about complex balances and trade-offs between bushfire protection and often-divergent social, environmental and economic requirements".

Heavy emphasis has been placed on the effectiveness of hazard reduction burning as the most cost effective means of management within the Abatement – Zone, however the Strategic Bushfire Management Plan states :

"The opportunity to schedule and implement prescribed burning within a desirable window of favourable conditions is relatively limited".

"Land managers and owners must take into account the potentially limited number of days and the possible interaction with air quality guidelines in the development, costing and implementation of prescribed burning programs".

Therefore the viability of maintaining the urban edge protection by hazard reduction burning and / or mechanical means needs to be established to guarantee the integrity of the Molonglo and Western Broadacre urban edge against damaging fire impact.

Under 6.2 – Shape of the Development Precincts [Page 32] the ABPP reports states:

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East Precinct.

"The long exposure of the north-western edge of the precinct to uphill burning fires, influenced by hot, dry, strong north-westerly winds, will result in significant fire impact either directly or indirectly from ember attack, depending on the level of protection provided by active management of the fuels within the river corridor.

Similar impacts may also occur to the western / south western edge from westerly and south-westerly wind-driven fires and the influence of wind turbulence in the Mount Stromlo area.

The northern edge will be impacted by fires burning within the habitat corridor, north of William Hovell Drive.

The Molonglo River Corridor will separate the eastern development node from the western development node and therefore provide a direct fire path into the suburbs adjoining the corridor and to the International Arboretum to the south east".

Under Section 6.4 – Habitat Corridors – Gazetted Nature Parks the ABPP report states:

"The Landscape and Environmental Analysis Plan in the Molonglo Valley Suitability Study identifies habitat connectivity for wildlife movement corridors from The Pinnacle to the north-west and alternate and /or additional Habitat Corridors between the three development precincts.

If the Habitat Corridor identified extending to the north-west of The Pinnacle remains it will allow fire to enter the West 1 Precinct and expose the adjoining urban development to fire impact.

The alternative Habitat Corridors will allow fires to penetrate between the development precincts. Management of these corridors for Habitat Protection and ecological protection will conflict with the need to provide active management of fuel hazards within the abatement zones to the perimeters of the urban precincts.

The Lower Molonglo River Nature Reserve will provide a direct northwest fire path for future bushfires to impact the central portion of the north western edge of the East Precinct and the return edges to the north east and south west of the Reserve".

Section 10.1 – Conclusion – Molonglo Valley [Page 43] of the ABPP report states:
"The orientation of the Molonglo Valley and the ability for northwest, west and south-west wind-driven fires to impact the proposed development edge will continue the extreme level of risk to any development proposed in the valley with the potential to cause major damage to buildings and infrastructure.

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Whilst the McLeod Report recommendation was for implementation of an Abatement Zone to the west and south-west of the City, the extent of the zone and the management abilities of those responsible for the fuel maintenance measures recommended, may not provide a level of defence which will remove the risk of devastating fires impacting to the north-western edge of the Molonglo East Precinct and the north-western, western and south-western edge of the Molonglo West 1 and West 2 Precincts".

It is therefore recommended that for development to proceed, the primary protection against the impact of fires to the north-western edge of Molonglo East and the north- western, western and south-western edge of Molonglo West 1 should be provided by the provision of a land use that creates a Critical Management Zone which is permanently fuel-managed by the nature of the land use. (i.e. vineyards / sporting grounds).

"The Molonglo River Corridor through the East Precinct should be actively managed as a Village Park to prevent fire extension into the precinct".

Figure 15 on Page 47 provides an extract from the Molonglo Concept Plan Bushfire Risk Assessment Report 2005 identifying the recommended bushfire protection measures. Subsequent to the preparation of the original Bushfire Risk Assessment Report [19.7.2005] an updated report was prepared by ABPP, dated 26.4.2006. The Executive Summary of this report states:

The Molonglo Stage 2 Bushfire Risk Assessment quantifies the current level of risk to future development within the Molonglo Valley, prior to the implementation of mitigation measures as ***Extreme.***

Mitigation measures which have been identified within the report as necessary to reduce the level of potential risk to future development include the creation and permanent management of a Critical Management Zone to the north-western edge of the East Molonglo Precinct and to the western and south-western edge of the Central Molonglo Precinct.

The provision of the Critical Management Zone (CMZ) replaces the Outer Asset Protection Zone, as defined in the Strategic Bushfire Management Plan for the ACT and the management of this zone, in accordance with the performance standards defined in this report, are considered to be a mandatory requirement in the reduction of the bushfire risk to the future development within the Molonglo Valley.

In addition to the provision of a Critical Management Zone to the north-western edge of East Molonglo Precinct, this report recommends, due to the risk of fire over-run along the Molonglo River corridor and into the future suburb, the damming of the Molonglo River below Coppins Crossing and the creation of Lake Molonglo".

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Figure 15 – Extract from the Molonglo River Structure Plan Bushfire Risk Assessment Report 2005 showing the recommended Bushfire Protection Strategies.

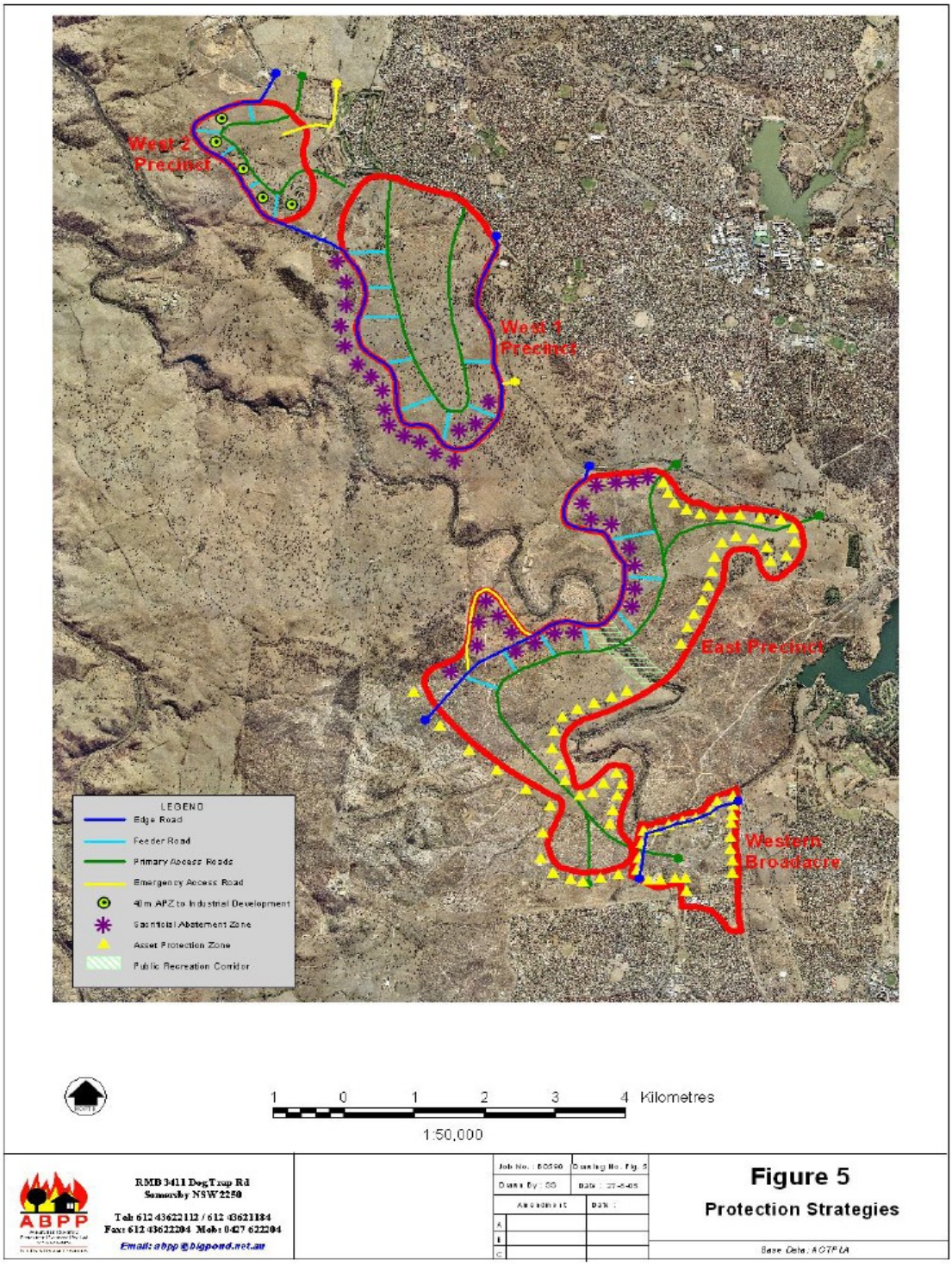
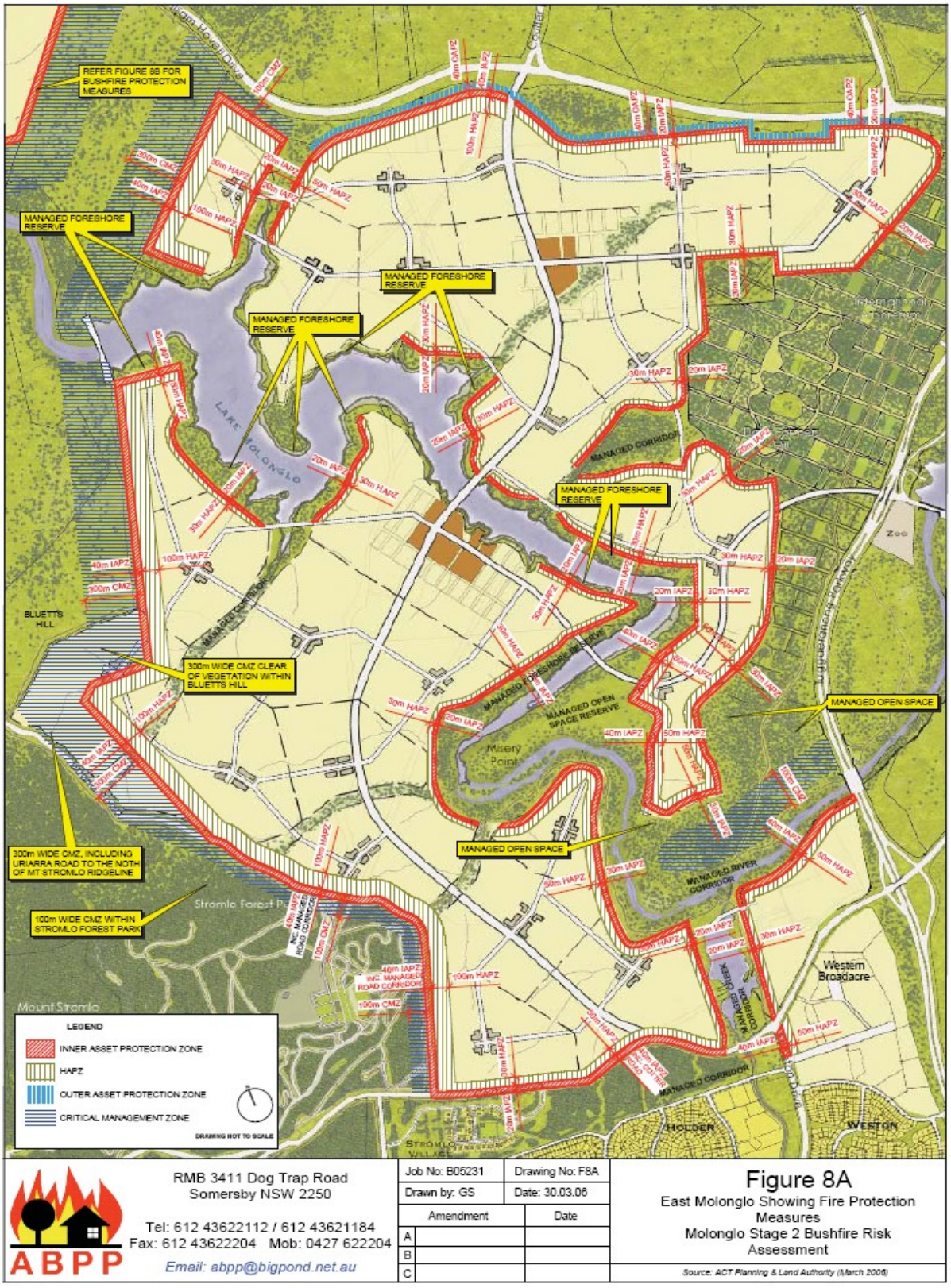


Figure 16 – Extract from the Molonglo River Structure Plan Bushfire Risk Assessment Report Stage 2 - 2006 showing the recommended Bushfire Protection Strategies



The recommendation contained within the latter report that damming of the Molonglo River below Coppins Crossing should occur to remove the bushfire risk along the river corridor was originally implemented in the Strategic Planning process, however is now not included in the Territory Plan.

The comments about the level of risk to the north-western edge and the risk posed by the retention of vegetation within the river corridor therefore defaults back to the original Bushfire Risk Assessment [19.7.2005] [refer to Figure 4 on Page 17] which recommended the implementation and management of a Critical Management Zone of at least 300 metres to the north-western edge of the new suburb and that the *"Molonglo River Corridor through the East Precinct should be actively managed as a Village Park to prevent fire extension into the precinct".*

Molonglo Valley Plan for Protection of Matters of National Environmental Significance – NES Plan (2011):

A review of the Molonglo Valley Plan for Protection of Matters of National Environmental Significance – NES Plan – September 2011 prepared by ACT Planning & Land Authority has identified that the aim of this document is to enhance the areas of Box Gum Woodland not only within the Molonglo River corridor but also within the Kama Nature Reserve and pockets of retained vegetation within the Molonglo Stage 3 precinct.

The document provides, under Section 2.3 – Bushfire Management Framework a 'motherhood' statement about bushfire management which reads:

"Within the strategic assessment area fire management will be aimed at protection of both built assets and MNES values. This will be achieved through the identification of appropriate asset protection zones and application of hazard reduction techniques that will both:

- *Ensure that the standards for fuel loads in the SBMP are met; and*
- *Protection MNES values through the use of sympathetic management techniques".*

The aim of this document does not address the recommendation that the river corridor is managed as a *'Village Park'* or the land to the west of Molonglo 3 and Denman Prospect is managed to mitigate the impact of fire on the north-western edge of the future urban development and from a fire spreading along the river corridor.

In the document under Management and offsetting it called for the establishment of a buffer outside of the Kama Nature Reserve on its eastern side to protect the ecological values of the reserve. It went on under Commitments to MNES:

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"Establish a buffer outside the Kama Nature Reserve between the reserve and the proposed development area, and allow for appropriate uses consistent with nature conservation uses of the reserve. The buffer will be developed to ensure that fire management is undertaken outside of the Kama Nature Reserve and will provide protection against urban edge effects."

The NES Plan recommends that the following reports be prepared:

1. 'Molonglo River Park Concept Plan';
2. Kama Management Plan;
3. Management Plan for Patch GG; and
4. Management Plans for High and Moderate PTWL habitat.

Molonglo River Park – Concept Plan prepared by Hassall (2012):

This document was prepared by Hassell in 2011 and finalised in 2012 and states that one of the primary objectives of the plan is to manage bushfire risk and details the need to provide Inner and Outer Asset Protection Zones as required by the *Strategic Bushfire Management Plan for the ACT 2009* with the Inner Asset Protection Zone located within the urban envelope and the Outer Asset Protection Zone and Strategic Fire Advantage Zone [SFAZ] located within the park.

Section 3 – Investigation Summary of the Concept Plan states:

"Risk assessments completed for Coombs and Stage 2 urban development areas identified a high to extreme bushfire risk for future urban areas. The most significant risk is that of a fire moving from the west or northwest, from which it would not only threaten the peripheral urban development in these areas but also potentially penetrate deeper onto the development area by moving up the Molonglo River corridor".

Under 'Additional Strategies' the report suggests that relevant group(s) further investigate the establishment of a 300 metre wide 'Critical Management Zone' to the northwest of the site – extending in a downstream direction from the north west limit of the park.

The table on page 51 is an extract from the Concept Plan identifying the Fire Management Objectives and Strategies.

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Objectives and strategies

Objectives of fire management	Strategies
Mitigate bush fire hazard.	Active management of fuels associated with vegetation within the park.
Mitigate the potential for the riparian area to have a 'wicking' effect that could carry a fire deep into the urban area.	Creation of a mosaic landscape in which the potential for long runs of fire fuels are minimised.
Afford the occupants of the urban areas adjacent to the park protection from exposure to a bushfire.	Development and maintenance of an outer APZ that complies with ACT Emergency Services Agency (ESA) standards. (ACT SBMP)
Provide defendable space and adequate separation to minimise the chance of direct flame contact and material ignition, for any assets that could be vulnerable to a fire, which would be located within the park lands.	
Provide for the ongoing maintenance of fuel loads and vegetation continuity within the outer APZ and parklands.	
Ensure that emergency service personnel and parkland users have access to adequate access and egress in the event of a bush fire.	Development and maintenance of a network of roads and fire trails that meet emergency services access requirements.
Ensure that utility services, particularly water supplies, are adequate to meet the needs of fire fighters.	Provide water supplies suitable for use during fire and fuel management exercises.

The Molonglo River Park Concept Plan Report's focus of the 'Fire Management Theme' is on strategies for the control of vegetative fuels within the following specific areas:

- Critical Management Zone [CMZ] to the west of the park;

- Strategic discontinuity zones within the riparian corridor which aim to reduce the ability of a fire to move continuously up the corridor and into the urban areas, and provide access for defence and fuel management;

- Outer APZ adjacent to the urban interface [Inner APZ within the statutory urban area, not in the riparian parkland].

The Molonglo River Park Concept Plan Report states that the Critical Management Zone forms a key component of the overall strategy to reduce the potential for a fire to move up the riparian parkland and into the urban areas.

"The Critical Management Zone is a 300 metre wide zone extending from the western boundary of the proposed urban areas and the riparian parkland, in a downstream direction. This area would be managed to provide a strategic fire break or control line to reduce the impact of a fire moving from the west/northwest, towards the urban areas".

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The report continues with advice on the strategic discontinuity zones and states that these zones "would be located at intervals within the parkland to reduce the potential for a fire to move continuously along the riparian corridor and potentially fuel an intense fire that could have catastrophic effects on the adjacent urban areas".

"The development of strategic discontinuities within the riparian parkland responds to the significant hazard potentially affecting this area, which is located on the north-west fringe of Canberra and is therefore directly exposed to extreme fire weather and the potential fire hazard associated".

"This strategy also responds to the potential of the riparian corridor itself to act as a 'wick', funneling a fire, driven by hot, dry, north-westerly winds, onto the heart of the urban area. This risk is a function of the physical location and the orientation of the river corridor itself".

"The discontinuity areas would be located:

- At the northwest extreme of the riparian area;

- Around, and to the west of Coppins Crossing, from the proposed sewer line crossing to the proposed extension of John Gordon Drive crossing the river;

- At Misery Point.

These areas would be characterised by more concentrated vehicle access and intense location of recreational facilities such as playing fields, parking areas, irrigated gardens and picnic areas. Alternatively, they would comprise open woodland/grassland habitat".

"Vegetation in the recreation areas would have the following characteristics:

- Large areas of groomed grassland maintained to a height of less than 100mm;

- Scattered tree planting;

- Formal parks and gardens with irrigated plantings.

"Generally fuels in these areas would be maintained by mechanical mowing/slashing. Where areas of PTWL habitat occur, fuels would be managed in accordance with the TAMS *Pinked Tail Worm Lizard Fuel & Fire Suppression Guidelines [TAMS 2011]".*

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“Outer Asset Protection Zones would be developed in accordance with ESA standards and the following OAPZ are required: Primary asset interface classification – 100m; Secondary asset interface classification – 0 metres.

All vegetation within the riparian zone would be maintained as grassland or open woodland.

Figure 17 shows the Molonglo River Park Illustrative Concept Plan prepared by Hassell.

Figure 18 shows the Molonglo River Park Illustrative Landscape setting Plan prepared by Hassell.

Figure 19 shows the Molonglo River Park Fire Management Plan concept prepared by Hassell.

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Figure 17 – Molonglo River Park Illustrative Concept Plan – Hassell.

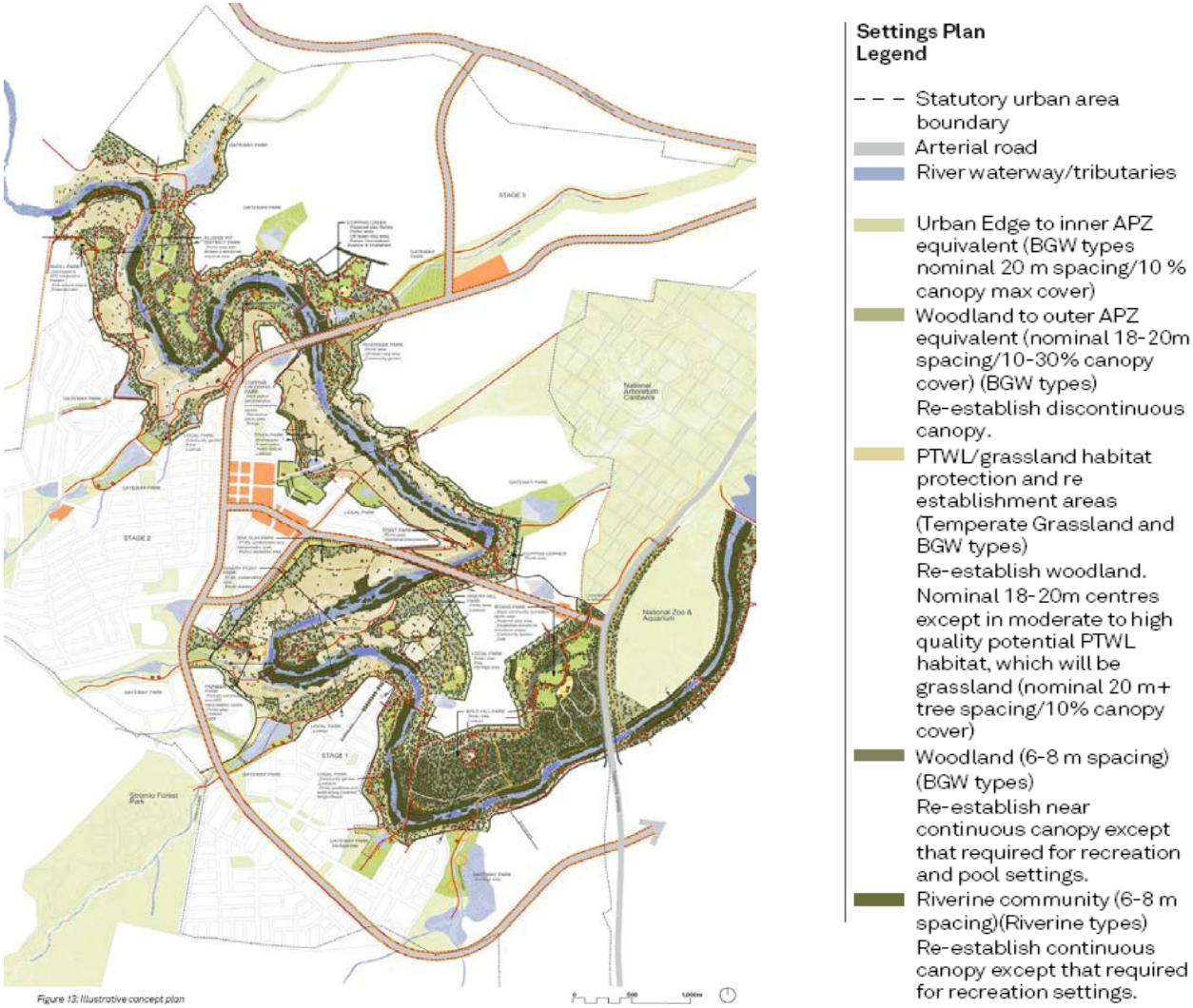

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Figure 18 – Molonglo River Park Illustrative Landscape settings Plan – Hassell.

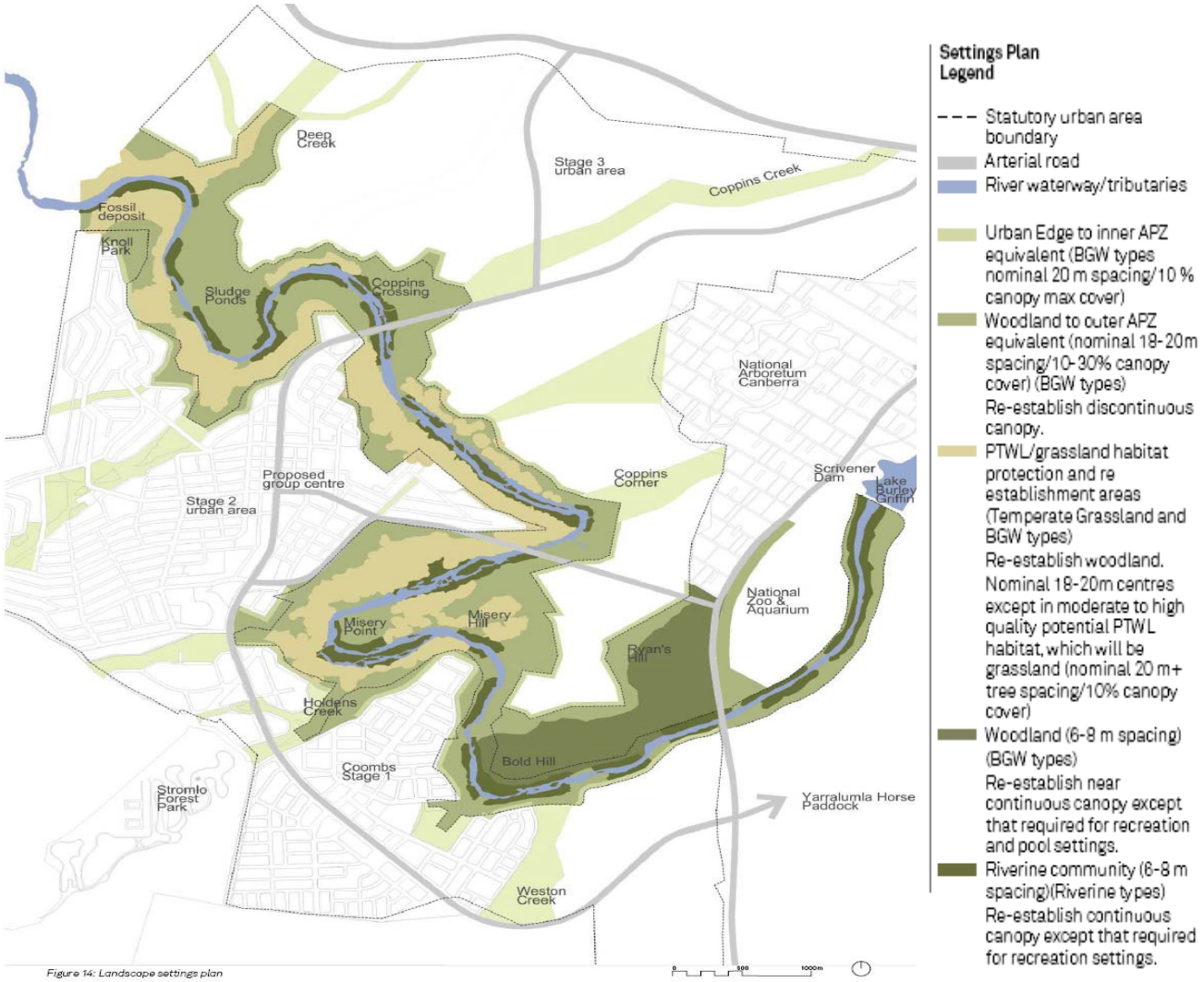

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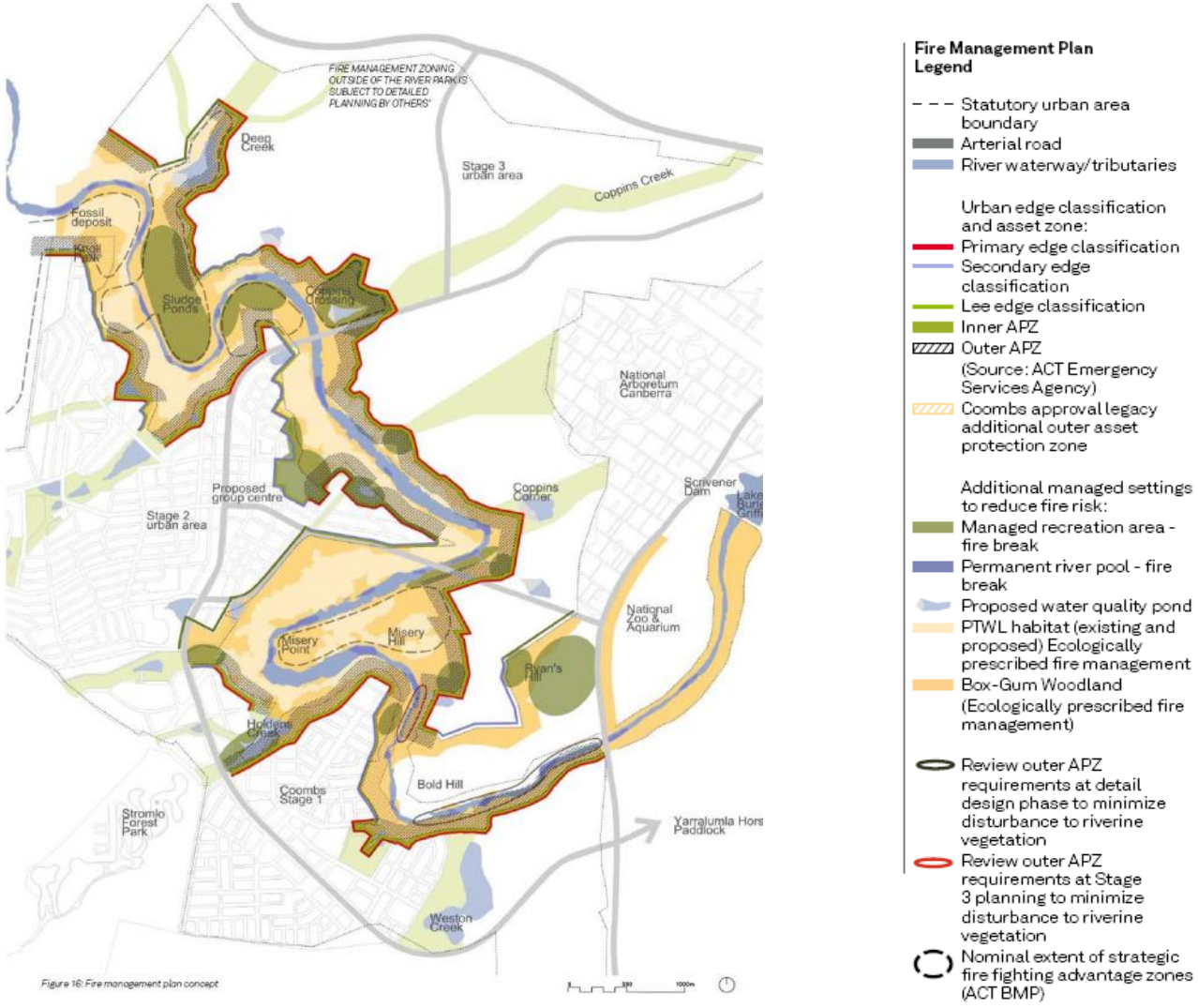
Figure 19 – Molonglo River Park Fire Management Plan Concept – Hassell.



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Section 7 of the Concept Plan also provides recommendations on the provision of access and egress and states:

'In addition to recreational access, where required within the park area, access and egress would be provided for emergency purposes and the maintenance of fire protection infrastructure. Road and trail standards would be designed in consultation with local emergency services to enable the traffic of emergency service vehicles and their access to adjacent, more natural areas of vegetation".

Figure 20 below provides sectional details of the location of Trunk Paths/Emergency Service access.

Figure 20 – Molonglo River Park – access – Hassell.

Section 7 – Concept Plan – Fire Management Theme states:

"Under the ACT Strategic Bushfire Management Plan, a Fire Management Plan would be developed for the Molonglo Valley in accordance with Emergency Services Agency [ESA] standards. The plan would take into account consideration of the recommendations of the existing bushfire hazard assessments for the proposed adjacent urban areas. The Molonglo Valley Fire Management Plan would provide the basis for the development of an overarching Plan of Management for the riparian area and annual Operations Plan [BOP]".

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Molonglo Adaptive Management Strategy – ESDD – (2013):

The Molonglo Adaptive Management Strategy (AMS) was a key commitment from the NES Plan. Its purpose was to define a set of measures designed to achieve the conservation outcomes and performance targets for MNES in Molonglo strategic assessment area.

One of the outcomes of the baseline condition assessment was that an assessment of the buffer zone consisting of patches O2, O3 and O4 located to the east of Kama Nature Reserve found that these patches were not representative of a Threatened Ecological Community.

Under Management Objectives for fire, the document makes the statement that fire management activities for the purposes of protecting the urban development east of Kama Nature Reserve will be undertaken outside Kama Nature Reserve. It goes on to mention:

"The prescribed eastern buffer zone for Kama Nature Reserve is to ensure that fire management is undertaken outside of the Reserve and will provide protection against edge effects."

There are no dimensions provided in the AMS that defines the width of the buffer to Kama Nature Reserve.

The document does not address the potential bushfire risk potential to the future development adjacent to Kama Nature Reserve.

Draft Fire Management Plan – Molonglo River Corridor – TaMS – (2015):

TaMS have prepared a draft Indicative Fire Management Strategy – Urban Area and the Indicative Fire Management Strategy – Molonglo Valley.

Figure 21 on Page 59 is a copy of the 'Indicative Fire Management Strategy – Urban Area prepared by TaMS.

Figure 22 on Page 60 provides a copy of the Indicative Fire Management Strategy – Molonglo Valley prepared by TaMS.

This document is currently with the ESA for consideration. Based on the current information available, the document raises issues which ESA require to be addressed.

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Figure 21 – Indicative Fire Management Strategy – Urban Area [TaMS 2015]

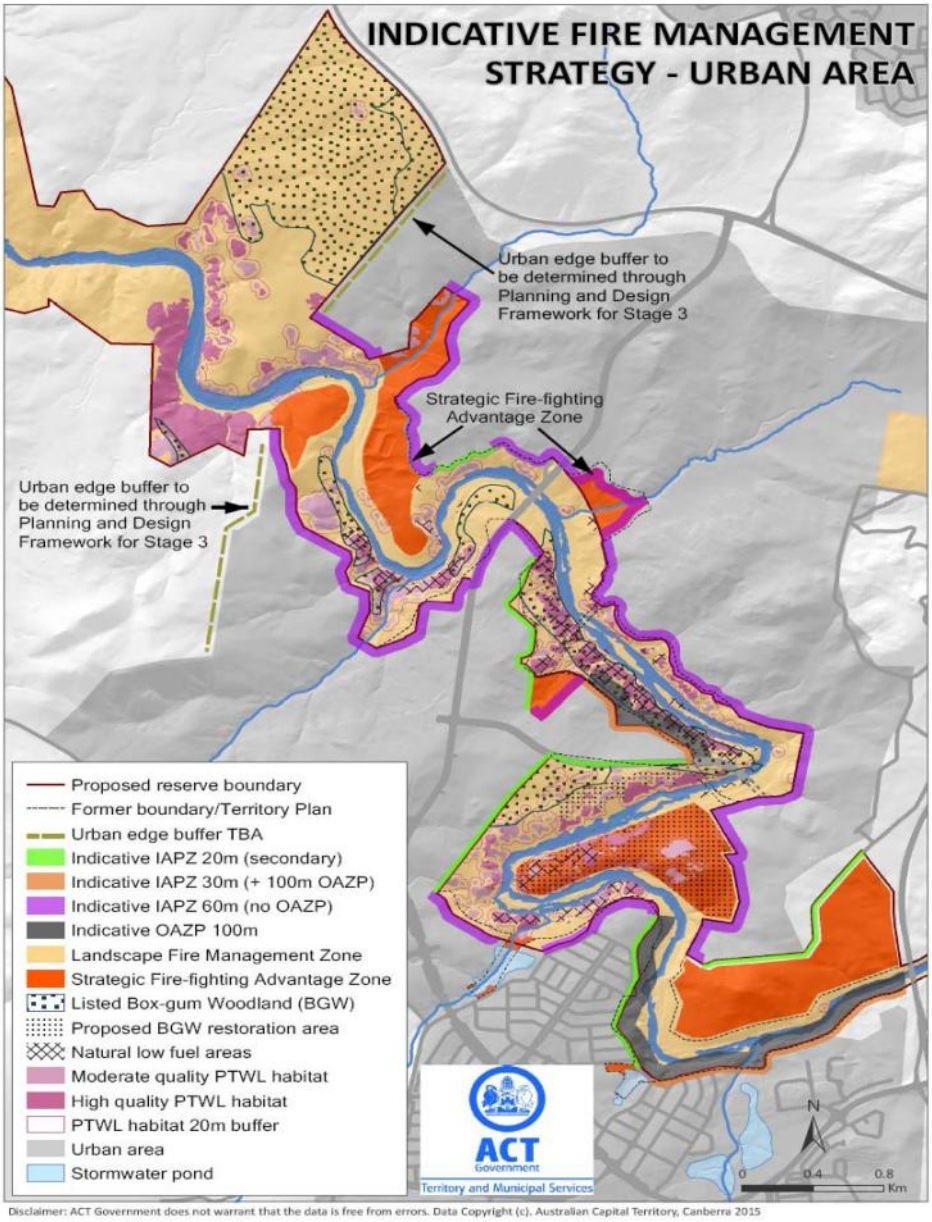

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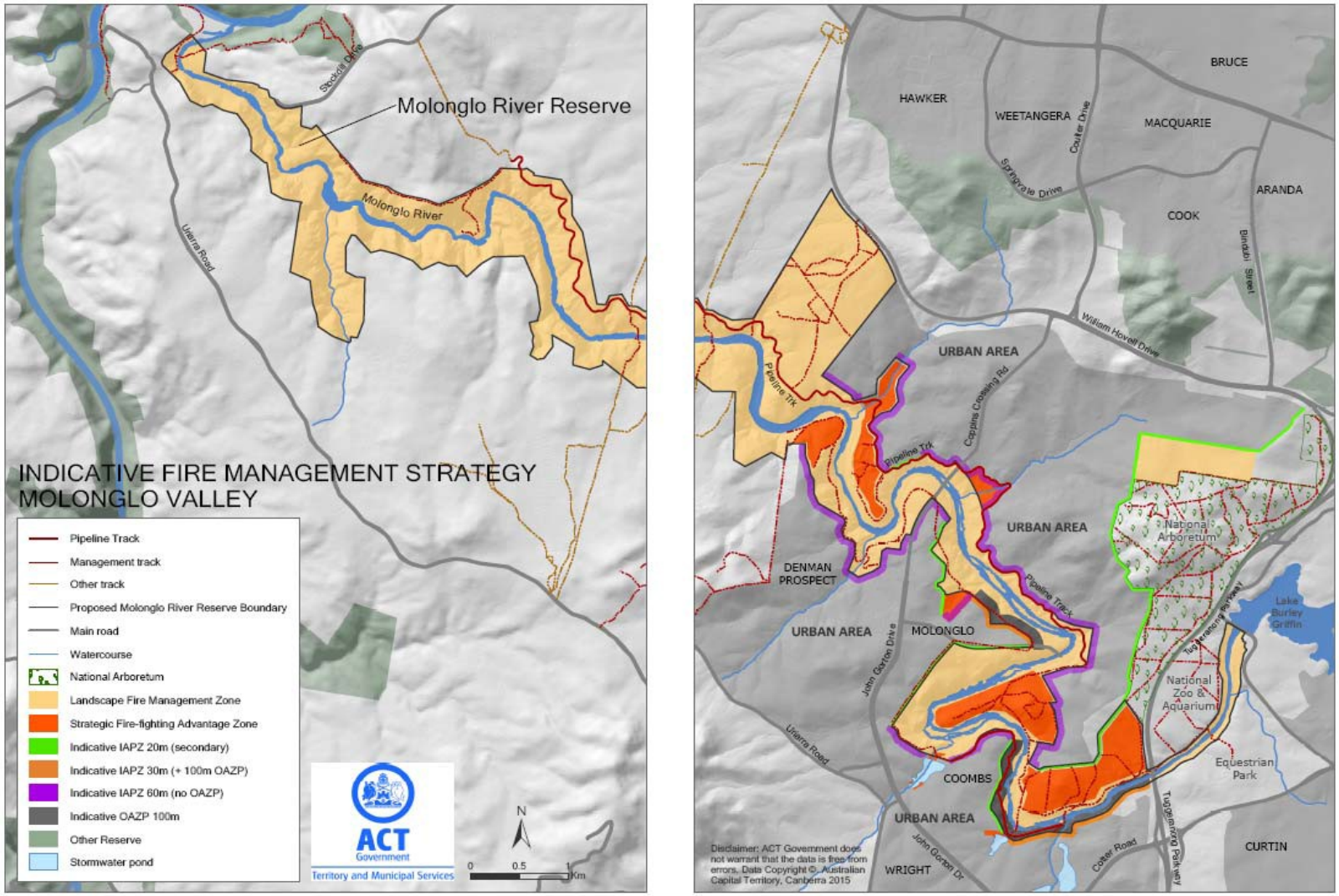
Figure 22 – Indicative Fire Management Strategy – Molonglo Valley [TaMS 2015]



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APPENDIX B – WORKING GROUP - MEETING DATES, LIST OF ATTENDEES & RESOLUTIONS

In late 2013 – early 2014, the Land Development Agency [LDA] identified the need to bring together a working group to examine the outstanding issues relating to the bushfire risk to the north- western edge of Molonglo 3; Denman Prospect and the Molonglo River Corridor.

Initially the Working Group consisted of representatives of LDA, ABPP and Umwelt to discuss issues and the way forward.

The brief of the Working Group was widened to bring together all Government Agencies involved in the development of the Molonglo East precinct to enable examination of previous studies, undertake site inspections and consider all options available so as to develop a report that establishes the principles, processes and funding required to address the bushfire risk.

Representatives of Government Agencies included:

- Dave Richardson [LDA];
- Kerry Browning [LDA];
- Adam Carmody [LDA];
- Dylan Kendall [TaMS];
- Adam Leavesley [TaMS];
- Nick Lhuede [ESA];
- Greg Potts [ACT RFS];
- Conrad Barr [Acting Chief Officer] ACT Fire & Rescue;
- Andrew Starke – Commissioner ACT Rural Fire Service;
- Ros Ransome [TaMS];
- Steven Gianakis [EPD];
- Daniel Iglesias [TaMS];
- Tony Corrigan [TaMS]; and
- Stuart McKenzie [EPD]

Two external companies were commissioned to provide assistance to the Working Group, Umwelt to undertake a peer review of the previous ecological studies and additional ecological investigations and ABBP to provide advice on bushfire risk, fire protection strategies and the preparation of a Bushfire Mitigation Strategy Report.

These companies were represented by;

- Peter Cowper Armstrong [Umwelt];
- Rob Armstrong [Umwelt]; and
- Graham Swain [ABPP].

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TaMS was invited to a second workshop on the 28th May 2014 with the aim to establish initial understanding of ecological values and management requirements and development of feasible options to manage bushfire risk. Attendees included:

- Dave Richardson [LDA];
- Kerry Browning [LDA];
- Adam Carmody [LDA];
- Dylan Kendall [TaMS];
- Peter Cowper Armstrong [Umwelt];
- Rob Armstrong [Umwelt]; and
- Graham Swain [ABPP].

Umwelt was commissioned to review the existing reports/studies and undertake field surveys and investigation into the vegetation and ecological values in Kama.

The results of this study are contained in the separate document attached as Attachment A.

Initial findings on the extent of the ecological value of the vegetation within Kama varied from the previous studies.

A third workshop was held on the 29th July 2014 with the aim to undertake a wider consultation with key fire planners within TaMS and ESA; establish a broader understanding of ecological values and management requirements and further development of feasible options to manage fire risk. Attendees were:

- Dave Richardson [LDA];
- Daniel Santosuosso [LDA];
- Adam Carmody [LDA];
- Dylan Kendall [TaMS];
- Adam Leavesley [TaMS];
- Nick Lhuede [ESA],
- Greg Potts [ACT RFS];
- Conrad Barr [Acting Chief Officer] ACT Fire & Rescue;
- Peter Cowper [Umwelt];
- Rob Armstrong [Umwelt]; and
- Graham Swain [ABPP].

Various options were considered in the methods of providing protection to the north-western edge of Molonglo 3 including support for the provision of an Asset Protection Zone within Molonglo 3 with the vegetation within Kama managed as a Strategic Fire Advantage Zone [SFAZ], provided that adequate on-going funding was available to support the management works in perpetuity.

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Following discussions on the protection measures for Denman Prospect, Umwelt were commissioned to review the existing reports/studies and undertake field surveys and investigation into the vegetation and ecological values of the vegetation within the north-western portion of Denman Prospect and the adjoining land to the northwest.

A fourth workshop was held on the 21st October 2014 with the aim of confirming the proposed management of the north-western edge of Molonglo 3 and examining options for fire management of the western edge to Denman Prospect and the Molonglo River Corridor.

Attendees were:

- Dave Richardson [LDA];
- Daniel Santosuosso [LDA];
- Adam Carmody [LDA];
- Adam Leavesley [TaMS];
- Greg Potts [ACT RFS] & Conrad Barr [Acting Chief Officer ACT Fire & Rescue];
- Peter Cowper & Rob Armstrong [Umwelt];
- Ros Ransome [TaMS]; and
- Graham Swain [ABPP].

At this meeting it was agreed that to the north-western edge of Molonglo 3 the proposed fire management zones would consist of:

1. A 60 metre wide Inner Asset Protection Zone, located inside the western edge to the Molonglo Stage 3 precinct;

2. A Fire Trail would be constructed along the boundary with Kama – inside the Molonglo Stage 3 precinct;

3. A managed fire break would be provided in Kama, adjacent to the boundary with Molonglo Stage 3;

4. That the vegetation within Kama would be managed in a series of Strategic Fire Advantage Zones, in accordance with the prescriptions provided by the *Strategic Bushfire Management Plan for the ACT* – 2009 – refer to Appendix C – Plan of proposed Bushfire Management Strategies – Kama/Molonglo 3 Western Edge.

   Existing access trails would be maintained and managed to provide edges to the Strategic Fire Advantage Zones – refer to Appendix C – Plan of proposed Bushfire Management Strategies – Kama/Molonglo 3 western edge.

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5. The proposed management strategies were supported by ESA provided adequate on- going funding was available to support the works in perpetuity.

The meeting also resolved to examine the fire management options for Denman Prospect provided by ABPP and to assess these options in the field.

It was also agreed to inspect the line of the Asset Protection Zone to the north of the river corridor, as determined by TaMS. This inspection was attended by Dave Richardson; Nick Lhuede; Adam Leavesley and Daniel Santosuosso and agreement reached that a 60 metre wide Inner Asset Protection Zone [IAPZ] be provided to the full length of the river corridor, measured from the outside (or riverside) of the existing Sewer Access Track.

Where stormwater management ponds occurred, the IAPZ will include these facilities.

The acceptance by ESA of the 60 metre wide IAPZ was predicated on the vegetation within the river corridor being managed as a Strategic Fire Advantage Zone which is to be maintained to the standards prescribed by the *Strategic Bushfire Management Plan for the ACT – 2014 – Version 3.*

An inspection of the western edge of Denman Prospect and adjoining land to the northwest was undertaken on the 28th November 2014. Attendees were:

- Dave Richardson [LDA];
- Daniel Santosuosso [LDA];
- Adam Leavesley [TaMS];
- Nick Lhuede [ESA],
- Greg Potts [ACT RFS];
- Conrad Barr [ESA][Acting Chief Officer ACT Fire & Rescue],
- Andrew Starke – Commissioner ACT Rural Fire Service;
- Rob Armstrong [Umwelt]; and
- Graham Swain [ABPP].

General consensus was reached on the location of the proposed fire protection measures which include the provision of a 60 metre wide IAPZ to the full length of the urban edge; management of a varying width Outer Asset Protection Zone [OAPZ] between the IAPZ and the retained forest vegetation within Denman Prospect and the management of the Territory Land to the northwest and west of the fire protection zones as a series of Strategic Fire Advantage Zones.

Whilst this consensus was broadly spread across the group concern was raised by ESA over the Strategic Fire Advantage Zone extending beyond the boundary of the Denman Prospect precinct and that this issue needed to be addressed before the final support of ESA would be considered.

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Another matter raised by ESA related to the environmental consequences of the management of the proposed Outer Asset Protection Zones and SFAZs and the cost of the ongoing management and the long term funding of the management program.

To address the matter of possible environmental consequences of the management of the proposed SFAZs, Umwelt were commissioned to undertake further studies to determine the location of vegetation communities, threatened species and the viability of management of the vegetation to achieve the fuel loads required in a SFAZ.

The results of the study are contained in the Umwelt Report attached as Attachment B.

The Umwelt report identifies an increase in the extent of Box Woodland, confirms the location of Pink Tailed Worm Lizard habitat and also confirms that the management of the SFAZs by hazard reduction burning is ecologically sustainable.

The Umwelt report was reviewed by Adam Leavesley from the Fire Management Unit of TaMS.

An inspection of the southern side of the Molonglo River corridor was undertaken on the 19th March 2015.

Attendees were:

- Dave Richardson [LDA];
- Daniel Santosuosso [LDA];
- Adam Leavesley [TaMS];
- Rob Armstrong [Umwelt]; and
- Graham Swain [ABPP].

This inspection examined the bushfire risk to the western edge of the Molonglo River Park and the fire paths/vegetation along the river corridor to the bend in the river, east of the Group Centre precinct.

Consensus was reached that the fire protection principle developed for the northern edge of the corridor [60 metre wide IAPZ within the urban development and management of the river corridor as a SFAZ] would be applied along the southern edge of river corridor.

It was noted that the position of the interface between any IAPZ and SFAZ would be identified at the time of developing EDPs for the length of this corridor in Denman Prospect.

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It should be noted that the LDA is undertaking a review of the EPD Group Centre Concept Plan east of John Gorton Drive and south of the river.

The review is examining the layout and dwelling densities against rational market expectations

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ATTACHMENT A – BRIEFING NOTE
KAMA NATURE RESERVE INTERFACE

UMWELT – 15th October 2013.

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ATTACHMENT B – ANALYSIS OF VEGETATION STRUCTURE AND FIRE RISK – WEST DENMAN PROSPECT

UMWELT – April 2015.

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ATTACHMENT C – DETAILED PLANS

Tel. 612 43622112 / 612 43621184
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ATTACHMENT D – SETTING UP THE WESTERN EDGE OF MOLONGLO STAGES 2 AND 3 FOR FIRE MITIGATION

COLEMAN ENGINEERING SERVICES – AUGUST 2015

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