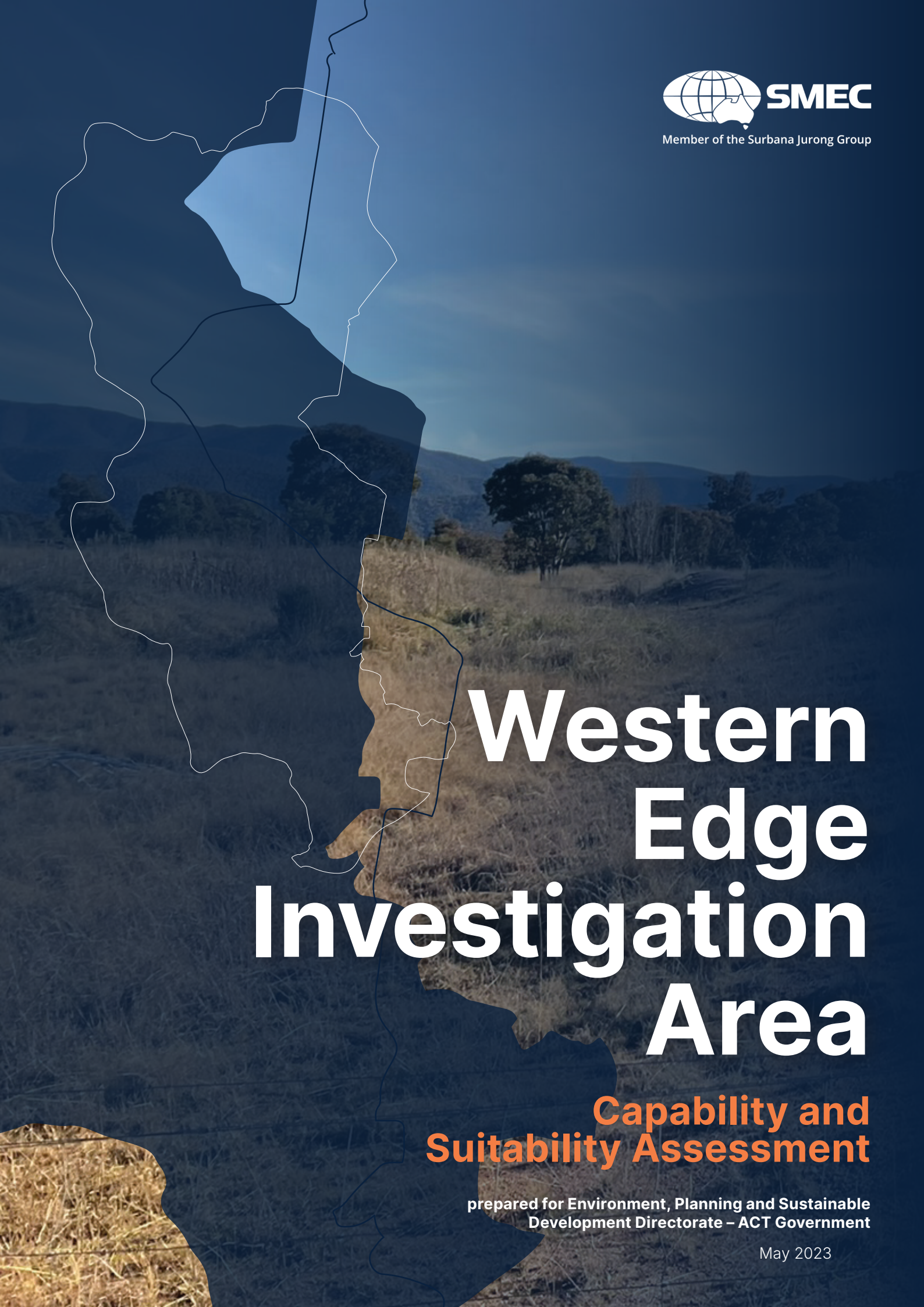


SMEC

Member of the Surbana Jurong Group

Western Edge Investigation Area

Capability and Suitability Assessment

prepared for Environment, Planning and Sustainable Development Directorate – ACT Government

May 2023

Through our specialist expertise, we deliver advanced urban development solutions for our clients and partners.

Leveraging our 70-year history of delivering nation-building infrastructure, we provide technical expertise and advanced engineering services to resolve complex challenges.

Through our network of global specialists collaborating with local partners, we connect you with the best teams and capabilities to deliver innovative and sustainable solutions.

We're redefining exceptional

Document Control

Document Type	Capability and Suitability Assessment
Project Title	Western Edge Investigation Area
Project Number	3002862
File Location	X:\Projects\30028\3002862 Western Edge Investigation Area\150 Deliverables\304 - Fourth Review\3002862-Capability Assessment - WEIA - Draft - 20230215 WORD (A40979381) (A41219336) KW.docx
Revision Number	01 –Draft

Revision History

Revision No.	Date	Prepared By	Reviewed By	Approved for Issue By
00	31 October 2022			
01	13 January 2022			

Issue Register

Distribution List	Date Issued	Number of Copies
Environmental Planning and Sustainable Development Directorate	13/01/2022	Electronic
Environmental Planning and Sustainable Development Directorate	25/05/2023	Electronic

SMEC Company Details

Approved by	
Address	Level 9 12 Moore Street, Canberra ACT 2601
Phone	+61 6234 1976
Email	
Website	www.smec.com
Signature	

Important Notice

This report is confidential and is provided solely for the purposes of undertaking a capability and suitability assessment of land use in the Western Edge Investigation Area. This report is provided pursuant to a Consultancy Agreement between SMEC Australia Pty Limited ("SMEC") and Environment, Planning and Sustainable Development Directorate – Planning and Urban Policy , under which SMEC undertook to perform a specific and limited task for Environment, Planning and Sustainable Development Directorate – Planning and Urban Policy . This report is strictly limited to the matters stated in it and subject to the various assumptions, qualifications and limitations in it and does not apply by implication to other matters. SMEC makes no representation that the scope, assumptions, qualifications and exclusions set out in this report will be suitable or sufficient for other purposes nor that the content of the report covers all matters which you may regard as material for your purposes.

This report must be read as a whole. The executive summary is not a substitute for this. Any subsequent report must be read in conjunction with this report.

The report supersedes all previous draft or interim reports, whether written or presented orally, before the date of this report. This report has not and will not be updated for events or transactions occurring after the date of the report or any other matters which might have a material effect on its contents, or which come to light after the date of the report. SMEC is not obliged to inform you of any such event, transaction or matter nor to update the report for anything that occurs, or of which SMEC becomes aware, after the date of this report.

Unless expressly agreed otherwise in writing, SMEC does not accept a duty of care or any other legal responsibility whatsoever in relation to this report, or any related enquiries, advice or other work, nor does SMEC make any representation in connection with this report, to any person other than Environment, Planning and Sustainable Development Directorate – Planning and Urban Policy or any other person who receives a draft or a copy of this report (or any part of it) or discusses it (or any part of it) or any related matter with SMEC, does so on the basis that he or she acknowledges and accepts that he or she may not rely on this report nor on any related information or advice given by SMEC for any purpose whatsoever.

Executive Summary

The ACT Planning Strategy 2018 (the Planning Strategy) defines the Western Edge Investigation Area (WEIA) as an area for further investigation into its potential to accommodate future growth. Understanding the capacity of the Western Edge will enable strategic planning for the future distribution of population throughout the ACT, as well as future transport, road, nature conservation, education, social, community and recreation planning.

This study builds upon existing preliminary studies and publicly available data to understand areas within the WEIA that may be suitable for future urban development, noting that detailed field assessments for ecological values have not yet been undertaken across the entire study area. As the Western Edge has a 40 to 50 year development horizon, it is important to consider how additional development can be appropriately serviced by transport and infrastructure, protected from bushfire threat and future proofed for climate change, whilst balancing the conservation of important biodiversity values. Such triple bottom line values and wellbeing considerations underpin all development decisions in the ACT, and extend to this strategic planning analysis for the Western Edge.

This project was undertaken in three key parts, with each stage building upon the previous part, to analyse the characteristics and developability of the WEIA. Stage 1 provides a high level assessment of land which is suitable for urban development based on existing physical and environmental characteristics, Stage 2 analyses the suitability of the potentially urban capable land and Stage 3 proposes indicative development scenarios.

Stage 1 - Land Capability Assessment

The Land Capability Assessment was based on the physical and environmental characteristics of the study area, as extracted from previous studies, publicly available data and data obtained from utility owners. The intent of this assessment was to undertake an initial quantitative analysis of the capability of the WEIA, with more detailed qualitative considerations in the suitability assessment. The capability assessment used spatial mapping and Geographic Information Systems (GIS) to identify land that is suitable for urbanisation, based on assessment against a series of agreed and weighted criteria. This is presented as a traffic light system, ranking the capability of land in the WEIA based on the presence of different constraints. This analysis provided a form of Multi-Criteria Analysis (MCA) that used GIS to compare physical and environmental constraints to provide a high level appreciation of areas that can potentially be developed.

Six ratings were selected to give appropriate sensitivity to the analysis of each criteria, ranging from least constrained through to very highly constrained and land excluded for urban development. The key results of the capability assessment are broadly summarised in Table 1–1.

Table 1–1 | Summary of findings from the Land Capability Assessment

Criteria	Result
Interface with adjoining land uses	The WEIA includes significant nature reserves including the Molonglo and Murrumbidgee River Reserves and smaller suburban nature reserves such as McQuoid's Hill and Cooleman Ridge. Other uses such as the Stromlo Recreational Area were excluded from development consideration due to the presence of community infrastructure and their inherent value to the wider community. Buffers were adopted around key Icon Water infrastructure at the Lower Molonglo Water Quality Control Centre (LMWQCC) and the Mount Stromlo Observatory. The land use capability assessment demonstrated that most urban capable land is located directly west of existing development in Weston Creek and south-east of development in West Belconnen.
Slopes and Soils	A slope analysis was developed using LiDAR data to build a digital elevation model (DEM) and provide approximate slope gradients. Areas with steep or waterlogged terrain and rock outcrops were rated as harder to develop in the analysis. Based on this alone, most urban capable land is directly west of existing development in the Molonglo Valley and Woden Valley and adjacent to Kambah.
Waterways and Waterbodies	There are a number of existing waterways within the WEIA and proximity to ecologically sensitive habitats in the Murrumbidgee and Molonglo River systems means that future development will need to be water cycle sensitive. The data used for the waterways and waterbodies criteria identifies areas within the river corridor as an area of restriction that has been 'excluded' and areas within the stormwater management buffer as very highly constrained. The remainder of the site is shown as 'somewhat constrained' but potentially suitable for future development.
Vegetation and Habitat	Maintaining habitat and biodiversity connectivity for all native flora and fauna and communities (not just those that are currently listed as threatened), including under climate change, is a key driver for considering land use capability and suitability across the

Criteria	Result
	WEIA. To understand habitat connectivity and linkages throughout the site, a baseline assessment was developed showing a layered assessment of previous studies and ACT Government connectivity layers. This analysis is preliminary given further detailed field assessments for ecological values will need to be undertaken. The raw data shows regional links of moderate value between McQuoid's Hill Nature Reserve and the Murrumbidgee River as well as clustering along Stony Creek and adjacent to the Kama Nature Reserve. The capability assessment shows that retaining habitat corridors will require further consideration as master planning for the Western Edge progresses.
Bushfire Risk	The bushfire capability assessment adopts the bushfire risk categories from the Preliminary Assessment undertaken by Ecological (2020). Risk categories were developed based on slope and vegetation type; however, the analysis did not consider bushfire hazard, threat to life or property, or the potential to safely evacuate. The adopted assessment criteria demonstrates that much of the site is classified as being capable of future development, subject to appropriate management of risk through master planning.
Road access and infrastructure	Key infrastructure within the site includes the 330KV transmission (managed by Transgrid) which runs north-south through the WEIA, the Molonglo Valley Interceptor Sewer (MVIS) which discharges to the LMQCC and bulk water supply infrastructure. Land along the eastern side of the WEIA is shown as 'highly constrained' where potentially existing service reticulation could be augmented and extended. Where significant infrastructure would be costly to relocate, such as HV transmission and bulk water and sewer mains, this is shown as an area of restriction that has been 'Excluded'.
Visual Impact	By adopting the 'Scenic Priority Scores' from the visual impact assessment undertaken by Van Pelt and Allen (2020), SMEC undertook an analysis of the results to determine the visibility of future development areas from key viewpoints and existing urban development. The capability assessment shows that elevated areas within Central Molonglo are more highly constrained, and generally occur within NUZ3 Hills Ridges and Buffers zoning or on Designated Land.

The results of the Land Capability Assessment are presented as individual thematic maps, and a consolidated capability assessment. The consolidated assessment was prepared in GIS adopting agreed weightings, to balance more important drivers of urban development (e.g., Vegetation and habitat slope and soils) with characteristics that can be managed (e.g., infrastructure, visual impact). The consolidated capability assessment classified land in the WEIA as 'constrained' through to 'very highly constrained'. Large areas with the lowest level of constraint generally occur in the southern half of the WEIA, along Uriarra Road and in the north, adjacent to Drake Brockman Drive.

Five 'investigation areas' were then drawn around potentially developable areas to provide key groupings for further investigation in the suitability assessment. For ease of discussion in this report, these five areas are the 'Central Molonglo Investigation Area', 'Uriarra Ridge Investigation Area', 'West Molonglo Investigation Area', 'Bulgar Creek Investigation Area' and 'Kambah Investigation Area'.

Stage 2 - Land Suitability Assessment

The Land Suitability Assessment provided a deeper, qualitative look into the characteristics, constraints and opportunities for each of the five investigation areas. A summary of the outcome of the assessment of each investigation area is provided in Table 1–2.

Table 1–2 | Summary of Land Suitability Assessment

Investigation Area	Description
Central Molonglo Investigation Area	The Central Molonglo Investigation Area has an approximate size of 1,240 ha extending south of Drake-Brockman Drive and West of William Hovell Drive and the Kama Nature Reserve. The area contains significant environmental values within the Molonglo River Reserve, Kama Nature Reserve, and Pinnacle Nature Reserve providing habitat for species including threatened Little Eagle and Superb Parrot. As a result, there is a need to maintain habitat and connectivity in this area. It is noted that the Kama Nature Reserve is identified on the ACT Heritage Register with the heritage curtilage boundary bigger than the nature reserve boundary. Kama is not identified within the Investigation Area for Potential Development. The site also contains

Investigation Area	Description
	the Lands End property and the Old Weetangera Cemetery which is listed on the ACT Heritage Register. It is noted that Lands End is not a registered heritage place, however, this does not preclude Lands End from being conserved a place of historic interest in response to community views. Further investigation has been recommended to determine the presence of Indigenous heritage sites. The area includes 132KV HV lines and the MVIS which follows the northern banks of the Molonglo River and is considered readily serviceable by road and utility networks. It is noted that there may be heritage constraints within this area which require further investigation to better understand development potential.
Uriarra Ridge Investigation Area	The Uriarra Ridge Investigation Area has an approximate size of 1,798 ha and is located north and south of Uriarra Road mostly comprising land zoned NUZ2-Rural. The ACT Heritage Register lists the property known as Huntly as having heritage significance and covers the majority of the area requiring that it be preserved as a rural property. Development potential of this will need to be informed through further investigation of heritage constraints. The site is relatively isolated with access via Uriarra Road only which presents a significant constraint for urban development. As there is no reticulated wastewater infrastructure within the site, it is likely that an additional bridge over the Molonglo River would be required to provide a crossing for services and additional vehicle access. Given the area's location between the Molonglo and Murrumbidgee River corridors, there is the need to maintain or increase habitat connectivity to support biodiversity. The area is identified as suitable for peri-urban uses such as rural residential and lifestyle blocks with development possible on each side of Uriarra Road.
West Molonglo Investigation Area	The West Molonglo Investigation Area has an approximate size of 1,785 ha and extends west from Wright in the Molonglo Valley. A significant portion of this area is designated land identified as the Mount Stromlo Observatory and Mount Stromlo Forest Park and is therefore excluded. Remaining urban capable land lacks connectivity to services and steep topography makes the area difficult to service with reticulated wastewater. Vehicle movements are restricted along Cotter Road and there would be a need to provide additional vehicle connectivity to support transport planning and the movements of people to/from the area. The area may be suitable for tourism and farm uses, or as a recreation precinct. There may be heritage constraints within this area which require further investigation to better understand development potential.
Bulgar Creek Investigation Area	The Bulgar Creek Investigation Area has an approximate size of 1,500 ha extending west of existing development in Weston Creek and south of the Stromlo Forest Park. This area provides a relatively flat terrain and is suitable for a range of potential uses. The proximity to existing development means existing utility services could potentially be extended from adjoining suburbs. An area mapped as Box Gum Woodland in the south of the site is recommended to be retained, as this is potentially EPBC-listed Critically Endangered remnant woodland. It is also recommended that Bulgar Creek be enhanced as a blue-green corridor throughout the area to provide habitat connectivity, stormwater management and to help manage urban heat island impacts There may be heritage constraints within this area which require further investigation to better understand development potential.
Kambah Investigation Area	The Kambah Investigation Area is approximately 668 ha in size with access primarily from Kambah Pool Road. The 330KV National Transmission line passes through this area along with a 132KV line. The area is surrounded by nature reserves including Cooleman Ridge to the east, the Murrumbidgee River corridor to the west, and McQuoids Nature Reserve to the south. Connectivity between nature reserves in this area will need to be maintained to ensure they are not isolated because of development. There may be heritage constraints within this area which require further investigation to better understand development potential.

Stage 3 Indicative Development Scenarios

Three indicative development scenarios were developed for each of the investigation areas, based on the outcomes of the capability and suitability assessment. The objective of the development scenarios is to provide the Territory with indicative footprints for future urban areas (subject to required detailed ecological investigations) as follows:

- **Land use Scenario One** – a 'low impact' approach avoiding direct impacts on currently mapped areas of likely ACT- and EPBC-listed threatened species and communities and key corridors. This scenario demonstrates there are very few areas in the WEIA that do not have a considerable degree of ecological significance.

- **Land Use Scenario Two** – an approach that delivers higher potential development outcomes while seeking to minimise impacts on threatened species and communities and maintain habitat connectivity.
- **Land Use Scenario Three** – an approach driven by connectivity to infrastructure, roads and efficiency of land use, without considering nature conservation requirements.

The scenarios adopted the following classifications for land use within each investigation area:

- Nature Reserve shows existing gazetted nature reserves.
- Potential Conservation Area shows areas with identified ecological sensitivity that should be avoided, or where impacts would need to be mitigated/offset. These are indicative only, subject to further ecological survey.
- Potential Habitat Connectivity corridors show high level linkages between areas of ecological sensitivity. These are indicative only and would require further targeted ecological survey to confirm exact widths and configuration.
- Potential Future Development covers land that the land use capability and suitability assessment identified as potentially urban capable. These areas warrant further investigation.
- Further Investigation Needed provides an overlay where priority should be given to understanding biodiversity or heritage site constraints.

The Indicative Development Scenarios provide a basis for ongoing investigation and testing of the capability and suitability for urban development of the WEIA. Further targeted environmental, heritage, traffic, hydrology and infrastructure investigations are required as part of future feasibility studies for each investigation area. The outcomes of the potential development scenarios are summarised as follows:

- **Scenario One**: Scenario One was developed to present a "low impact" scenario. The 'potential development area' in this scenario is land which is not currently identified as having any listed threatened species or communities or key habitat corridors and is very limited. It is not considered feasible to develop solely on these areas, meaning all development scenarios will involve direct impacts on key conservation values and are likely to require offsets.

  Central Molonglo Investigation Area: Areas of Central Molonglo have been highlighted as providing breeding habitat for the threatened Superb Parrot in the eastern portion of the investigation area. This is one of only two documented breeding sites nationally for this species. The ACT Action Plan for this species requires a 200m buffer around any Superb Parrot breeding location to avoid disturbance. In regard to potential future development, Scenario Two provides an area of 51% (630 ha) while Scenario Three provides significantly more at 75% (927ha). However, given the significant ecological values and the Heritage Listed Kama Nature Reserve and Weetangera Cemetery, additional studies are recommended in this area as a priority to understand developability.

  It is noted that past government commitments removed a significant portion of this area from being considered as a future urban area. This will need to be reconsidered in light of further studies and based on evolving and changing needs.

- **Uriarra Ridge Investigation Area:** There are a number of challenges associated with this investigation area, including road access via Uriarra Road which does not provide sufficient redundancy for general traffic movements and emergency services. Steep topography presents infrastructure challenges, and a significant area is covered by the heritage listed Huntly property and there are known ecological constraints in the area. The capability and suitability assessments determined that priority should be given to the development of other investigation areas, and the development of Uriarra Ridge would be considered in the longer term. A total of 23% (420 ha) of the investigation area is identified as potential future development area in Scenario 2, compared to 85% (1,525 ha) in Scenario Three.
- **Bulgar Creek Investigation Area:** Scenario Two provides a reasonable amount of future development at 76% (1,342 ha), with good connectivity to existing suburbs in Weston Creek with access via Cotter Road, Eucumbene Drive, and Hindmarsh Drive. Scenario 3 identifies approximately 71% (1,036 ha) of land as potential development area. Further consideration of how to balance development with areas of ecological sensitivity, natural water courses and access to infrastructure should be prioritised for this area. Future studies should define a study boundary, noting that there may be potential economies of scale to include land north of Cotter Road and further south within this investigation area.
- **Kambah Investigation Area:** As this investigation area is bounded by several nature reserves and the Murrumbidgee River Reserve, access in and out is considered constrained. Kambah Pool Road provides connection from the south, however connectivity into the Bulgar Creek Investigation Area is required to provide access north. Limited access would impact staging and timing if development in this area were to be progressed in isolation. Scenarios Two and Three provide similar outcomes of 95% (633 ha) and 97% (645 ha), respectively. An area requiring further targeted ecological and heritage study is noted within this investigation area. Prioritisation of these investigations is recommended to provide further insight into potential developability.

Scoring and Prioritisation

To enable the comparison of urban development clusters and potential development scenarios, it was necessary to pass each investigation area through a decision framework. The use of a strategic merit test was considered an appropriate method to

analyse the indicative development scenarios. The strategic merit test was run utilising the Scenario Two indicative development option.

Each of the three investigation areas were assessed against how well they align with each of the design principles and scoring of High (3), Medium (2) or Low (1) with ratings then aggregated to confirm an overall score. The aggregated score rated Central Molonglo and Bulgar Creek Investigation Areas evenly at a total of 44 out of a possible score of 48. Kambah ranked lower at 29. As a result, it is recommended that further investigation be prioritised for the Central Molonglo and Bulgar Creek Investigation Areas, with recognition of previous government decisions relating to Central Molonglo.

Recommendations

This project takes a high-level appraisal of existing studies and data to determine the capability and suitability of land within the WEIA to accommodate future urban uses. It is noted that the work within this study is intended to be used as a benchmark for further studies and determination of urban viability, alongside further targeted environmental, heritage, traffic, hydrology and infrastructure investigations. It is further noted that due to the high ecological values across the Western Edge Investigation Area, development may likely impact significantly on listed threatened species and communities and/or connectivity.

Once the appropriate studies have been prepared, the indicative development scenarios can be altered to reflect the outcomes of these more detailed investigations and preliminary master planning / structure planning can be undertaken. Master planning should consider biodiversity and ecological connectivity needs (including under climate change), bushfire risks (likewise under climate change), how to incorporate Designing for Country principles and Aboriginal people, how to protect urban expansion from the impacts of climate change and how to efficiently connect into existing transport and infrastructure. The types and densities of land uses should also form part of the future structure planning, to define how these future communities will look, feel and best address the characteristics and challenges of the Western Edge.

Contents

Figures

Tables

1. Introduction

The ACT Planning Strategy 2018 (the Planning Strategy) defined the Western Edge Investigation Area (WEIA) as an area for further investigation for future urban growth. The ACT Government has also established targets to achieve 70% of additional housing within established areas, to source 100% of ACT power from renewable sources, to phase out natural gas and to provide highly connected, accessible and vibrant urban areas that are supported by high frequency public transport. Based on recent Australian Government population projections, it is expected that the ACT will have a population of 550,000 by 2033 (Australian Centre for Population 2023), an increase of around 100,000 residents.

The Planning Strategy provides an indicative boundary for the WEIA, confirming the potential strategic direction of greenfield growth in Canberra through to 2050 and beyond. Understanding the capability, suitability and ultimately the population capacity of the Western Edge is critical to informing strategic planning for the future of Canberra, including resolving the appropriate densities of urban renewal areas within the existing urban footprint and along key growth corridors.

The WEIA project presents an opportunity to build community climate change resilience through climate sensitive urban design, water cycle management, habitat connectivity, and green and living infrastructure. Climate change is expected to increase the average annual number of hot days over 35°C, increase extreme fire weather and result in a change to rainfall patterns in the ACT. This will have implications for sensitive and threatened species within the Western Edge and will require thoughtful and climate sensitive development to support community wellbeing.

The ACT Government has goals to improve the liveability and adaptability of the Territory to the impacts of climate change by implementing Canberra's Living Infrastructure Plan. The Living Infrastructure Plan seeks to achieve climate resilience by adopting adequate and appropriate mature tree cover, accounting for the value of living infrastructure and addressing local needs for managing urban heat island effects. Strategic planning to ensure efficient and sustainable development that maintains and enhances community wellbeing and biodiversity will be integral to the successful growth of Canberra.

An objective of the Planning Strategy is to provide a 'compact and efficient city' and is a primary consideration in the early master planning of the Western Edge. It will be essential to ensure that any future development of this potential greenfield area is able to provide a high level of residential amenity and housing typology choice, provides containment of local trips through ensuring there are opportunities for recreation, employment and education within the local area with good active travel, public transport and appropriate road connections to the existing network within adjoining suburbs, while also responding to challenging geotechnical conditions, topography and escalating bushfire risk.

The WEIA is known to be of high ecological importance. It contains significant areas of natural habitat, populations of many threatened species and two Critically Endangered ecological communities. The study area also neighbours the ACT's major waterway, the Murrumbidgee River. Equally important is the conservation and protection of biodiversity and key habitat linkages consistent with the ACT's Nature Conservation Strategy, including creation of appropriate urban open space and nature reserves, retention and restoration of natural hydrology, and creation of a blue-green grid (which will also enhance urban cooling). Recognition of the Aboriginal cultural values and European heritage values is a further key value to be respected in this process.

The WEIA project presents an opportunity to promote best practice sustainability targets and climate change resilience, which may assist in infrastructure demand management and alleviate capacity issues. A proactive and considered approach to future proofing development in the ACT in this way, would align with existing Territory policies that are putting ACT at the forefront on the journey to a lower carbon future.

1.1 Project Context

This study is driven by the Strategic Directions of the Planning Strategy, which prompts the investigation of the capability and suitability of the Western Edge. This study has strategic importance in the consideration of planning reform in the ACT, as well as future transport, road, education, social, community and recreation planning. This study is also highly relevant to utilities master planning by Evo Energy and Icon Water, noting the five-year legislative planning horizons required for utility providers.

Understanding the capacity of the Western Edge is an enabler to considering the future distribution of population throughout the ACT, particularly noting the desire to provide 70% of new housing within the existing urban footprint. However, it is recognised that the WEIA contains varied and significant environment and heritage values that will require further and more detailed investigation in the next phase of strategic planning.

Noting the significant constraints across the WEIA, this study takes an initial 'first pass' approach to determining areas that may be better suited to future development. Future development of land within the WEIA would be subject to standard land development processes including the identification of specific sites, detailed estate and precinct planning, prior to eventual land release and development. It is expected that this study will assist the ACT Government to better understand the opportunities and constraints of the WEIA and options for future land use within the study area.

1.2 Project Objectives

This study seeks to assess the potential for development within the WEIA, including consideration of land use capability and suitability based on spatial analysis of existing constraints.

1.3 Project Overview

This project has seven key components, which build upon existing preliminary studies and publicly available data to understand areas within the WEIA that may be suitable for future urban development. The development horizon is 40 to 50 years, requiring future-proofing and consideration of appropriate transport, bushfire, biodiversity and infrastructure corridors that will service the needs of the future community, whilst addressing the triple bottom line values and wellbeing considerations underpinning all development in the ACT.

This project was undertaken in three key parts:

- Land Capability Assessment
- Land Suitability Assessment
- Scenario Testing.

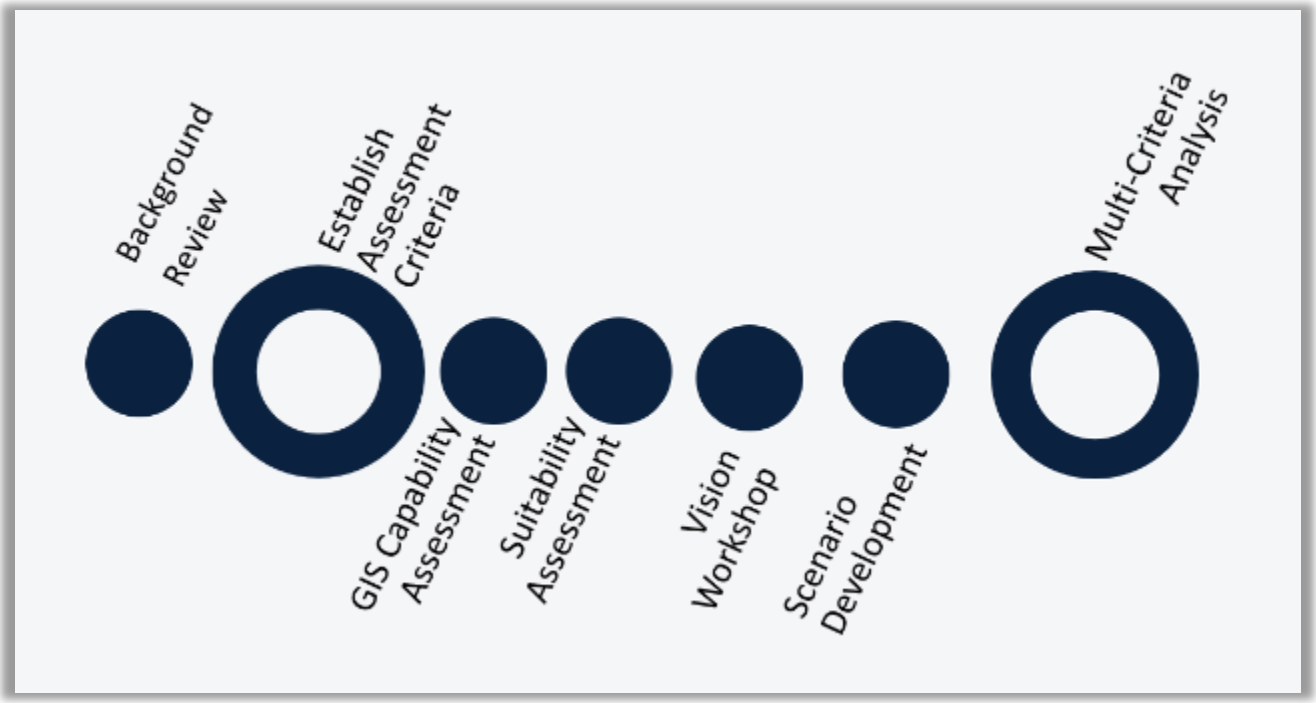


Figure 1-1 | Overview of the key project phases

The methodology for each of these tasks is described in further detail in Section 6. The assessment uses spatial mapping and Geographic Information Systems (GIS) to identify land that is suitable for urbanisation. The assessment is based on a review of the following environmental and physical characteristics:

- Interface with adjoining land uses
- Slope and soils
- Waterways and waterbodies
- Vegetation and habitat
- Bushfire risk
- Road access and infrastructure
- Visual impact

An analysis of each of the above attributes was undertaken using a scoring system, based on Multi-Criteria Analysis (MCA) principles. These were then weighted and combined into the 'Consolidated Capability Assessment' (Section 6.4) which rates areas as follows:

- Somewhat constrained
- Constrained

- Highly constrained
- Very highly constrained
- Restricted

GIS was used for its ability to combine, overlay and analyse multiple spatial attributes across the WEIA. This enables a comparison of physical and environmental constraints to provide a high level indication of development potential.

The second part of the project was a Land Suitability Assessment, which clustered and compared parcels of urban capable land, to develop and understanding of the opportunities and challenges of each area. Based on the outcome of the land capability assessment, this assessment clustered geographic areas within the WEIA into five investigation areas: Central Molonglo, Uriarra Ridge, Bulgar Creek, West Molonglo and Kambah.

Three indicative development scenarios were developed for consideration:

- **Land Use Scenario One** – a 'low impact' approach acknowledging the presence of all ecological values (identified potential listed habitat, habit corridors, as well as listed vegetation under ACT and Commonwealth legislation). This scenario demonstrates that there are very few areas in the WEIA that do not have some degree of ecological significance.
- **Land Use Scenario Two** – an approach driven that delivers development outcomes while seeking to minimise impacts on threatened species and communities and maintain habitat connectivity.
- **Land Use Scenario Three** – an approach driven by connectivity to infrastructure, roads and efficiency of land use.

These scenarios and investigation areas were compared using a Strategic Merit Test, as a form of MCA, to prioritise areas for development. The logic and mathematic basis of the MCA process assisted with the qualitative nature of comparative assessment of each scenario, however it must be noted that there is a low degree of granularity to this assessment, due to the high level nature of this study. It is recommended that the next phase of the project include site specific investigations and master planning, which will enable more detailed consideration of potential development footprints and land uses.

Upon engagement, opportunities to collaborate with the Project Control Group (PCG) throughout the project were identified, and a consultation strategy was prepared (Chapter 5). A series of workshops were held throughout the project to establish the assessment criteria as the key framework for the project and to ensure the scenarios were responsive to identified ecological characteristics and development constraints.

2. Study Area

The WEIA project seeks to investigate land use capability and suitability for the potential urban expansion of Canberra into the 'Western Edge'. The WEIA is approximately 9,800ha and is bounded by the Murrumbidgee River to the west and by the suburb of Kambah to the south, and existing suburban development to the east (Weston Creek and Molonglo Valley) and north (Belconnen and West Belconnen). Primarily the WEIA is within the district of Stromlo, however, also has some areas within the districts of Tuggeranong, Weston Creek and Belconnen. Figure 2-1 below shows the WEIA area in relation to the existing suburbs of Canberra.

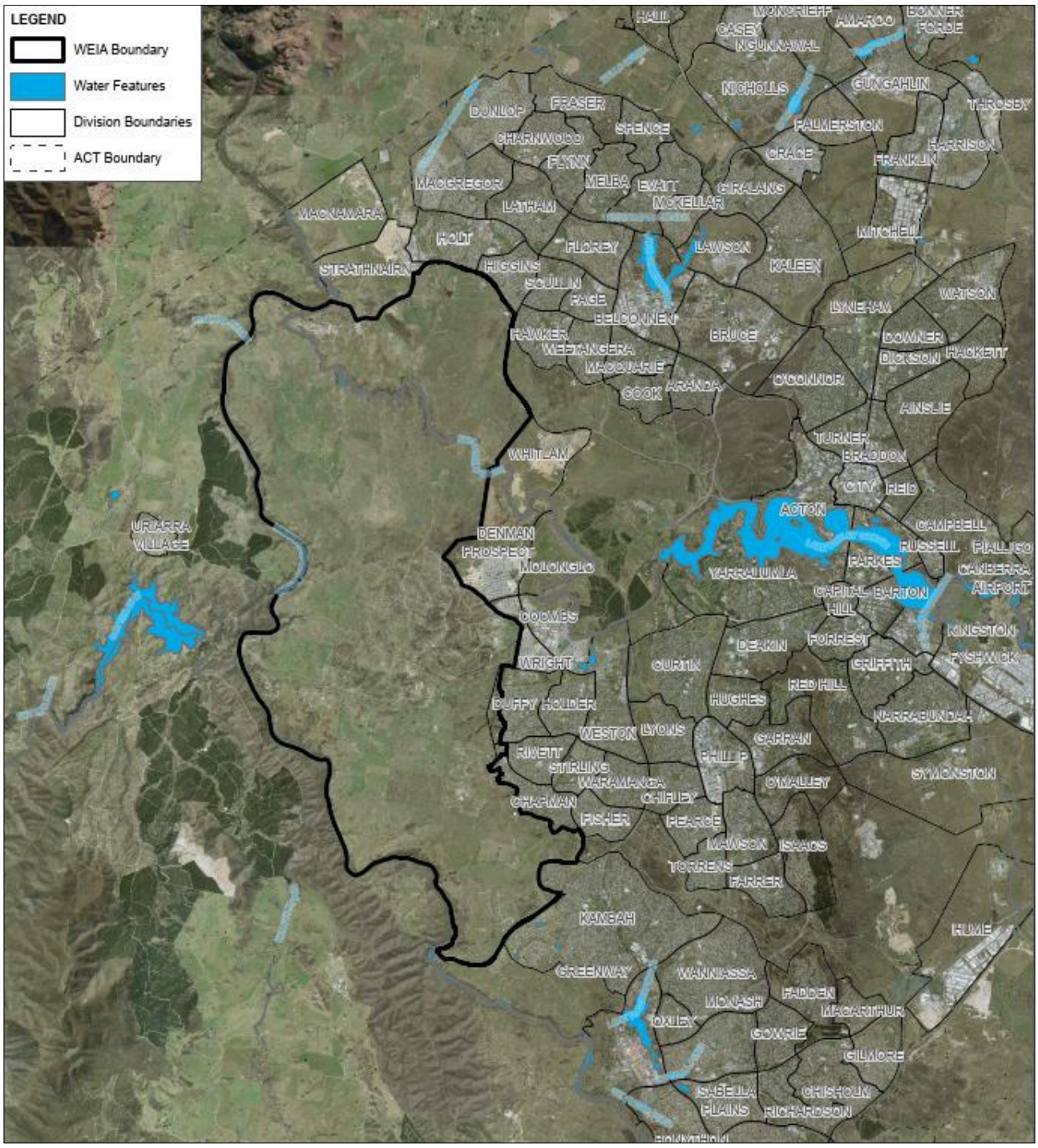


Figure 2-1 | Western Edge Investigation Area showing existing suburbs

2.1 Study limitations

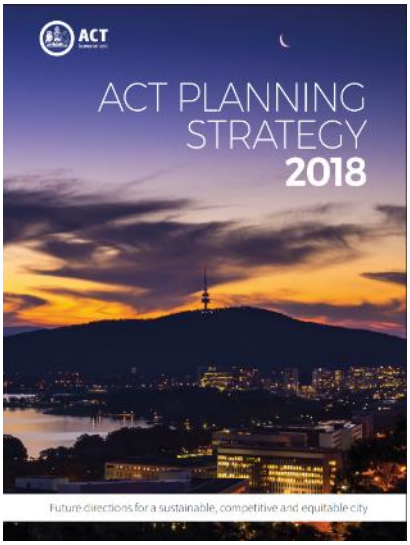
Through undertaking a capability and suitability assessment, this study assesses a number of urban development scenarios for the WEIA. These scenarios are hypothetical only and are based on a wide range of assumptions to provide indicative development options. They are based on ecological data available at the time of writing. It is recognised that this data is still incomplete for the investigation area and that further ecological surveys and assessments will provide additional information into the future. The impacts of climate change have not been considered for individual urban development scenarios, noting that future development of the Western Edge should include measures to mitigate the possible effects of climate change, including, but limited to green and blue infrastructure to promote habitat connectivity and urban cooling.

The development scenarios have been prepared to provide a basis for consideration of potential development in the WEIA. They detail areas that may require further specific investigation to confirm their capacity for urban development. Additional studies into the feasibility of these scenarios, and detailed master planning of the infrastructure required to support population growth will be needed.

The extent to which these urban expansion areas are realised will depend on ACT Government policy and market demand for greenfield development over the course of the next 50 years. **The individual maps and information are highly indicative only and should not be relied on in isolation**.

3. Planning Context

3.1 ACT Planning Strategy 2018



The Planning Strategy identifies the need to investigate new residential areas to the west of the city to meet future expansion needs so that diversity in housing choice can continue to be provided. Action 1.2.1 of the Planning Strategy aims to undertake environmental, infrastructure and planning studies for the western edge of the city to identify suitable areas for:

- Potential urban areas (excluding Central Molonglo)
- Nature reserves
- Environmental offset and potential environmental offset areas
- The consideration of cultural and heritage values
- Other uses, for example rural, broadacre, major infrastructure, transport and services.

The Planning Strategy recognises that the options for urban expansion in the ACT are limited. To the east of the city, the airport and environmentally significant areas preclude residential development, and to the south, bushland and mountainous areas limit urban expansion. Similarly, to the north, land is constrained by the ACT/NSW border and nationally significant environmental areas.

The WEIA is identified as a Future Urban Intensification Area in 'Map 6 Growth Map' of the Planning Strategy (Figure 3-1). This study is intended to provide additional information to focus future strategic planning activities on land that is capable and suitable for urban development.

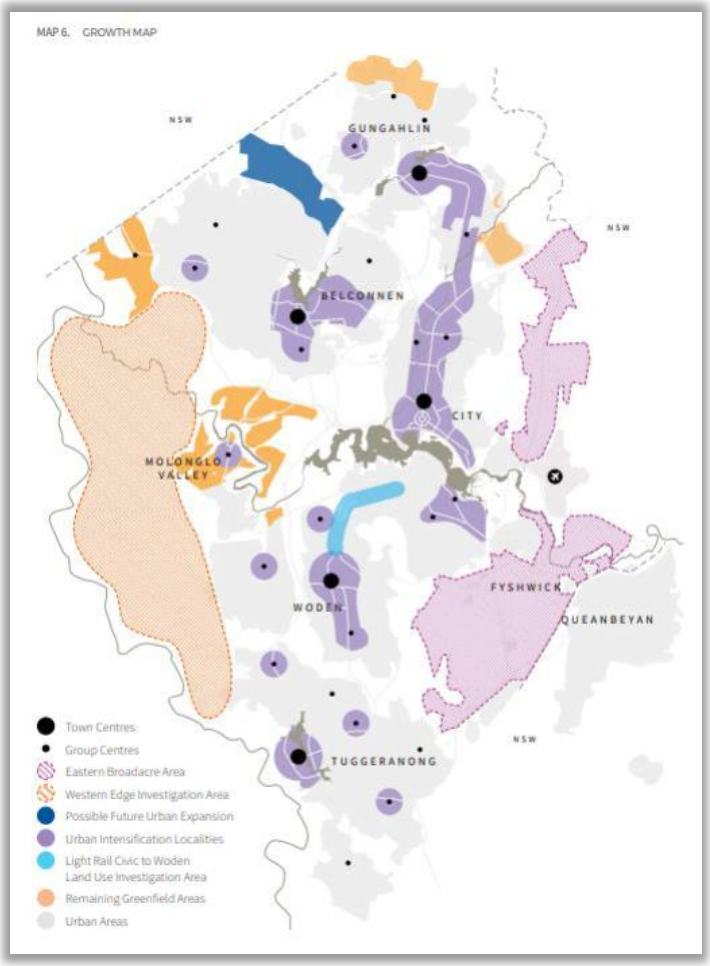


Figure 3-1 | The ACT Planning Strategy defines the WEIA as a Future Urban Investigation Area

3.2 ACT Territory Plan 2008

The land within the WEIA is predominately zoned NUZ2-Rural under the ACT Territory Plan 2008 (Territory Plan) and is the primary future urban area under consideration in this study. There is an area of 'Designated Land' under the National Capital Plan present within the site covering Mount Stromlo, Narrabundah Hill, Cooleman Ridge and McQuoid's Hill Nature Reserve. Areas along the Murrumbidgee River and the Molonglo River are zoned NUZ4 River Corridor, with areas in the northern section of the study area zoned NUZ3 Hills Ridges and Buffers.

The Lower Molonglo Water Quality Control Centre (LMWQCC) is located to the north of the WEIA and the Mount Stromlo Water Treatment Plant is also located centrally within the WEIA area, to the south-west of the Mount Stromlo Observatory. Both treatment plants and the Observatory have buffers to residential development to avoid potentially conflicting land uses.

Publicly available mapping on ACTMapi indicates the presence of a number of critically endangered and ecologically diverse habitats throughout the WEIA. Other characteristics of the WEIA include bushfire risk, high degree of slope, presence of natural water ways and drainage lines, and the identified presence of cultural heritage artefacts and areas of European Heritage significance.

Concurrently with this study, the ACT Government is undertaking a review and reform of the planning system. The Planning and Reform Project will introduce a new Planning Bill, Territory Plan and District Strategies to facilitate the growth and development of Canberra.

3.3 Climate Change Strategy 2019

The ACT Climate Change Strategy 2019 sets out pathways for adapting to climate change and mitigating the associated impact in the ACT setting. Any future land use change in the WEIA will need to align with the actions identified in the Climate Change Strategy, including the goal to achieve "Net Zero Emissions" by 2045. This will require investment in zero emissions infrastructure, sustainable urban design and a substantial shift in travel habits from private car use towards active travel and public transport.

3.4 Canberra's Living Infrastructure Plan: Cooling the City

The Canberra Living Infrastructure Plan sets a vision to achieve climate resilience by adopting adequate and appropriate mature tree cover, accounting for the value of living infrastructure and addressing local needs for managing urban heat island effect. Any future development in the WEIA will need to consider efficient and sustainable urban land use that maintains and enhances community wellbeing and biodiversity and is supported by living infrastructure.

3.5 ACT Transport Strategy 2020

In order to ensure Canberra is becoming a *compact, sustainable and vibrant city by 2040*, the ACT Transport Strategy 2020 (the Transport Strategy) concentrates on future planning and investment in the transport system in the ACT. A strong vision has been established for the Transport Strategy along with the ambitions outlined in the Planning Strategy and the Climate Change Strategy. The Transport Strategy aims to provide more attractive, flexible travel options that increase choices for residents in a high-quality, convenient, safe, and reliable environment.

3.6 ACT Housing Strategy 2018

The ACT Housing Strategy 2018 (Housing Strategy) puts in place policy interventions to meet the Territory's diverse and changing housing needs and provide a sustainable supply of housing for households at all income levels. The Housing Strategy sets an objective to provide new land and housing development opportunities so that demand can continue to be met. The WEIA identifies land on the Western Edge of the city that is suitable for meeting the sustainable housing and growth needs of the city.

3.7 ACT Nature Conservation Strategy 2013-23

The ACT Nature Conservation Strategy (NC Strategy) sets out a vision for biodiversity rich, resilient landscapes stretching from the inner city to the mountains, where well-functioning ecosystems can meet the needs of people and the environment. The WEIA study contains many threatened species and two critically endangered ecological communities. Further investigation into maintaining habitat and connectivity and the functioning of natural ecosystems should be undertaken as part of any future planning of development in the WEIA.

4. Background Analysis

4.1 Previous Studies

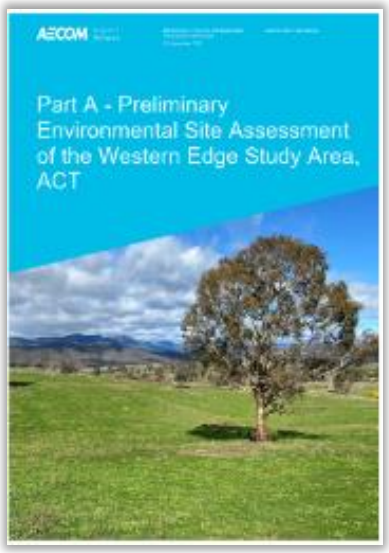
The ACT Government has been investigating the potential for development of the Western Edge through a number of previous preliminary investigations. There are also a number of concurrent studies which have the potential to be influenced by this project, including the Parkes Way and Corridors Study, the Multi-Modal Network Plan and recalibration of the Canberra Strategic Transport Model. Existing Territory planning policies also provide relevant context to this project. This section provides a brief overview of current policies and previous investigations that have informed the scope of this assessment.

The previous studies undertaken seek to establish a series of baseline conditions of the environmental values of the study area to establish the capability, suitability and ultimately, the capacity of the Western Edge to accommodate future development. A summary of the previous studies that are relied upon in the WEIA Capability and Suitability Assessment is provided below.

Preliminary Environmental Site Assessment of the Western Edge Study Area, AECOM 2020

This was a desktop study and targeted field assessment of the WEIA study area to confirm potential sources of contamination and areas of concern associated with current and historical uses. Current and historical potentially contaminating activities were found to occur consistently across the study area as they are associated with the current and former rural land uses.

Contamination



- A select search of the ACT EPA Register of contaminated sites was undertaken and showed that there are 36 sites within the WEIA listed as being potentially contaminated. This is due to the presence of sheep dips or stick drenching activities, chemicals used for pest control or forestry plantations, underground storage tanks, plant and machinery facilities associated with the Mount Stromlo Observatory, asbestos sheeting and heavy metals associated with buildings destroyed by the 2003 bushfire, stockpiles, imported fill, animal burial pits, UXO/EOW associated with former Department of Defence activities, chemicals associated with grape cultivation, and sewage treatment at the Lower Molonglo Water Quality Control Centre and Mount Stromlo Water Treatment Plant.
- The study also identified the potential for contamination associated with the former Stromlo Landfill which was used for the disposal of Asbestos Containing Materials (ACM) following the 2003 bushfire. Whilst the former Stromlo Landfill is outside of the WEIA area, understanding its location is relevant to the land use capability and suitability assessment.
- The use of PFAS foams for firefighting during the 2003 bushfire was not found to be particularly widespread, and the study found that the risk of associated contamination is likely to be low.

Ground Water

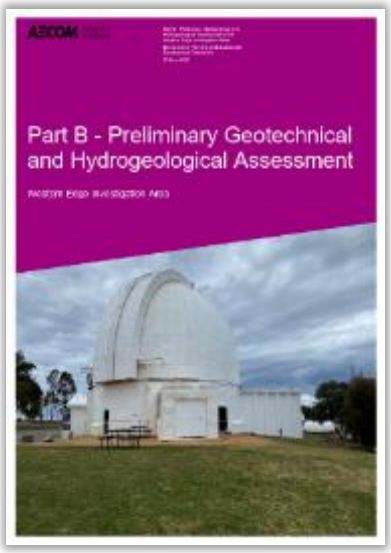
- Six groundwater abstraction bores were found within the WEIA area, with depths of between 7m and 72m below ground level, accessing both alluvial and deep rock aquifer sources.
- A primary matter highlighted in the report was the potential risk of Unexploded Explosive Ordnance (UXO) and Exploded Ordinance Waste (EOW) along the north eastern boundary of the WEIA area. Further investigation was recommended to confirm the actual risk, and to inform further detailed investigation into AECs.
- This study concluded that additional investigation into site contamination should be informed by master planning and the outcomes of the capability and suitability assessment.

Preliminary Geotechnical and Hydrogeological Assessment of the Western Edge Study Area, AECOM 2020

This preliminary assessment sought to identify existing geotechnical and geological conditions, groundwater environment and areas that may constrain future development.

The report found that the soil landscapes within the WEIA study area comprise both Campbell landscapes, surrounding Mount Stromlo and the eastern part of the site; Burra landscape through the undulating low hills; and Williamsdale throughout the remainder of the site.

- The Campbell soil landscape comprises steep erosional terrain, with extensive exposures of rock outcrop. The ability of these areas to support urban development is limited, due to soil mass movement potential, steep slopes and rocky outcrops.
- Areas of Burra landscape occur around the drainage lines that are steep with localised erosion where slope wash materials move to the Molonglo and Murrumbidgee River courses. Seasonal waterlogging in areas of Burra soils may constrain urban development.
- The remainder of the site is identified as Williamsdale soil landscape, and includes areas of undulating rises, fans, valley flats and depressions. These areas are known for seasonal waterlogging and high water tables, which can constrain urban development with high water retention in soils and problems with septic effluent disposal.
- In relation to groundwater, this preliminary assessment confirmed that there may be a need to undertake de-watering during excavation for construction in lower lying areas. There are assumed to be several groundwater dependent ecosystems within the WEIA area, including Murrumbidgee, Ginninderra and Molonglo Rivers. The study also indicated that there were 18 registered groundwater bores in the study area with depths of 15.6m to 86.3m. The productivity of these bores is not known.



The preliminary study developed a conceptual terrain model and determined that:

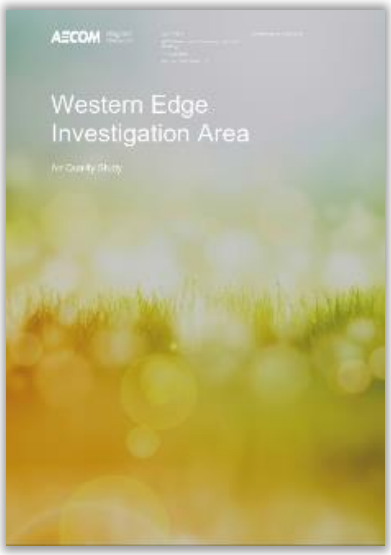
- Development of areas immediately adjacent to and upslope of the Murrumbidgee and Molonglo Rivers should be avoided as these areas present a risk to development due to the soil characteristics, potential for erosion and landslip;
- There are severe limitations for urban development of river flats due to rock outcrops, shallow soils and steep slopes. There is a potential foundation hazard due to moderate land slip potential;
- Development adjacent to incised drainage lines should be avoided due to erosion, potential for flooding and waterlogging. Master planning should consider an appropriate buffer from these identified drainage lines.
- Areas identified as Williamsdale soils present few constraints to urban development, as concerns relating to waterlogging and soil creep, appropriate effluent and surface water disposal can be appropriately managed in the future engineering subdivision design.

Western Edge Investigation Area – Air Quality Study, AECOM 2020

This study undertook a baseline assessment of air quality in the WEIA and confirmed that current air quality is good due to the lack of significant industry/urbanisation. As a result of the microclimate, prevailing winds and topography, there are some areas within the WEIA that could experience pollutant accumulation. As a result, the report recommends the banning of wood heaters within the future urban area.

Proximity to the Lower Molonglo Water Quality Control Centre (LMWQCC) was also considered, and the report recommends that further assessment be undertaken of land within the WEIA that is impacted by odours from sewage treatment processes, and if so, what appropriate mitigation measure should be considered. A buffer zone of 2.4km around the LMWQCC, similar to that provided to development in West Belconnen, is recommended to be adopted to the interface with the WEIA. It is noted that this buffer may be an overassessment given the extent and purpose of previous studies and the process upgrades currently planned for LMWQCC that are likely to improve the efficiency of treatment and reduce odour.

Changes to the management of odour along the Molonglo Valley Interceptor Sewer (MVIS) are being considered as urban development in the Molonglo Valley alters the way odour is managed in future urban areas. Similarly, if urban development were to occur within close proximity of existing vent stacks in the WEIA, upgraded odour mitigation may be needed.



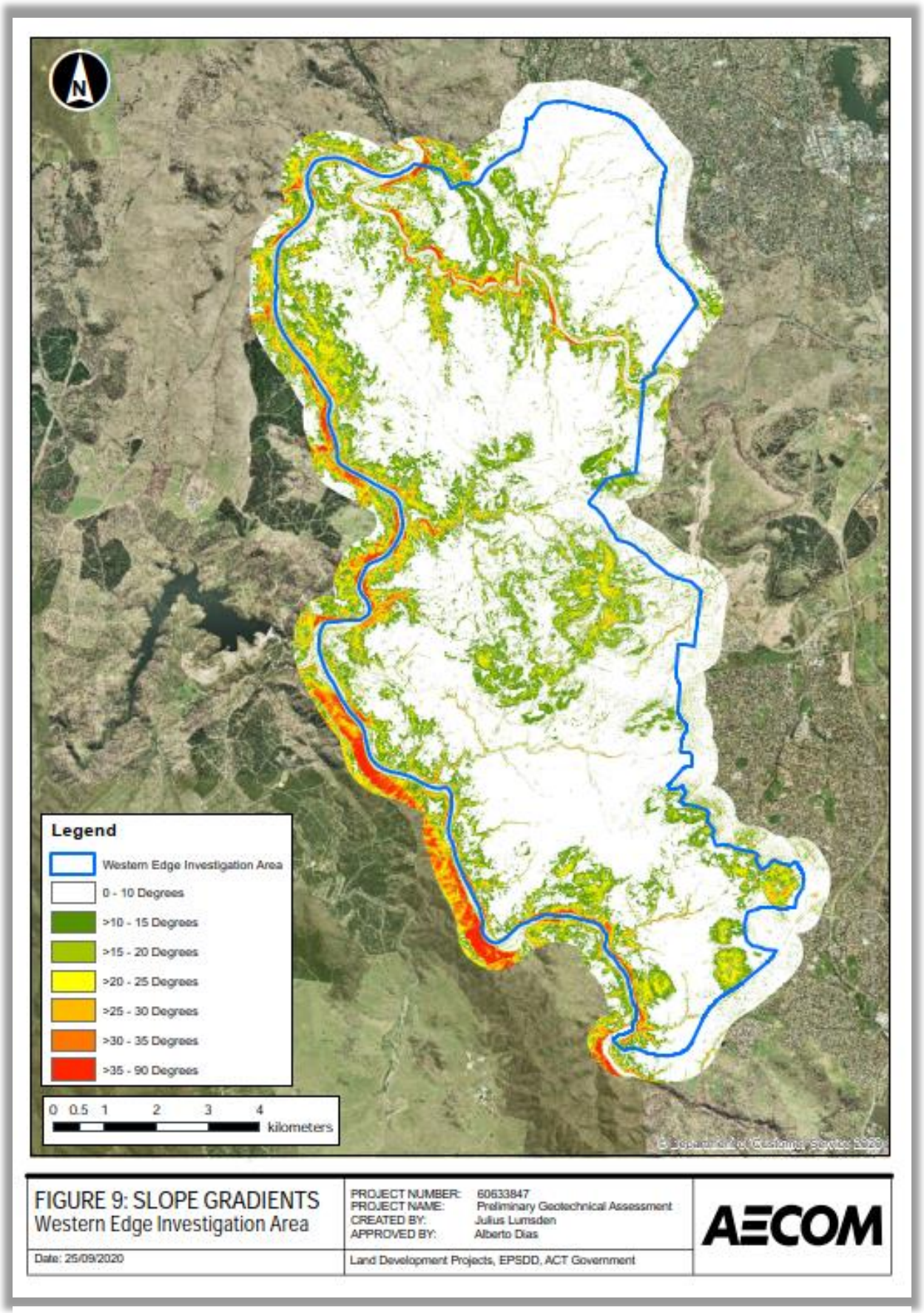


Figure 4-1 | Slope Gradients Identified in the AECOM Preliminary Assessment by AECOM 2020

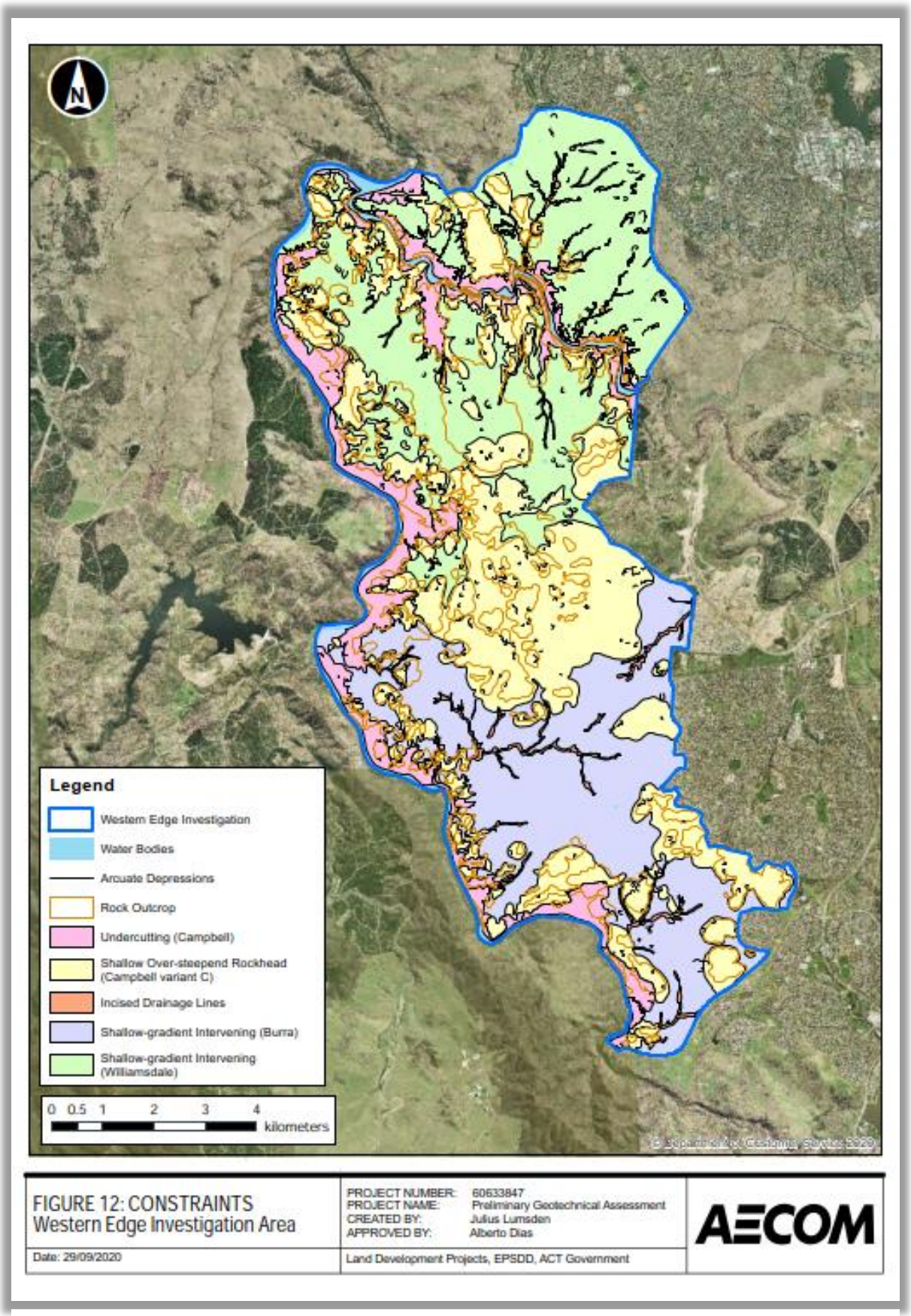
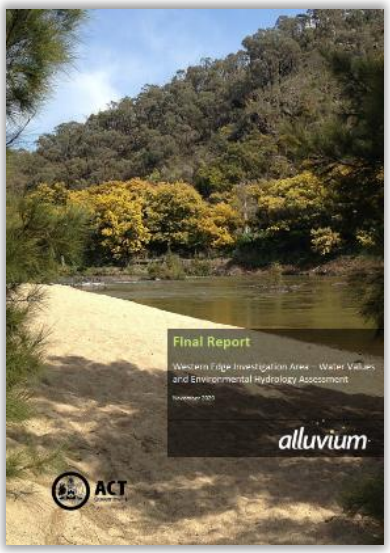


Figure 4-2 | Soil Landscapes identified in the Preliminary Geotechnical Assessment by AECOM 2020

Western Edge Investigation Area – Water Values and Environmental Hydrology Assessment – Alluvium 2020

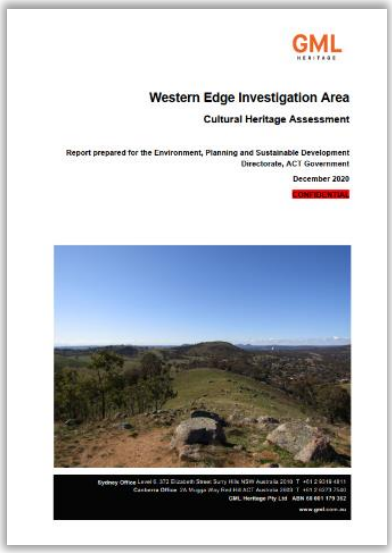


This study sought to identify and describe the water-related values, catchment management issues and potential constraints for future development. Key findings of this study include:

- A MUSIC model was developed to describe the anticipated pollutant loads for a conceptual residential development, and found the potential for a tenfold increase in Total Suspended Soils, 5-6 times increase in Total Phosphorous and 3-4 times increase in Total Nitrogen. As a result of the land use change associated with urbanisation, Water Sensitive Urban Design (WSUD) measures would need to be incorporated to meet the regional and developer targets of the WSUD General Code.
- Opportunities for artificial lakes and wetlands to manage flashiness of storm flows, sediment and nutrient load associated with urbanisation. An initial suggestion is made for the location of large-scale stormwater treatment assets, based on terrain and catchments.
- There are opportunities for riparian revegetation to offset the potential impacts associated with the development of the WEIA.
- Recommendation to consider a maximum impervious area for urban blocks, to reduce surface runoff and overall environmental impact of urbanisation.
- Recommendation for a buffer around and including river corridors to allow sufficient space to treat stormwater, manage its flow down the escarpments and into the Murrumbidgee and Molonglo Rivers to avoid erosion.
- Control the depth and cut/fill of excavation to avoid disturbing areas of high salinity or interaction with the groundwater table.
- Opportunity for rehabilitation and protection of ephemeral creeks for recreation, amenity, education, water quality treatment and ecological restoration.

This study provided a suggestion for appropriate zoning, based on water values and hydrogeology. The findings of this assessment are incorporated into the Capability Assessment.

Western Edge Investigation Area Cultural Heritage Assessment, GML Heritage 2020



A Cultural Heritage Assessment (CHA) was prepared to assess how the landscape was previously used and occupied by Aboriginal communities. It notes that the Murrumbidgee and Molonglo Rivers acted as key transport corridors for communities and show a reasonable density of artefacts, culturally modified trees and cultural areas.

A guiding model was developed which assessed the potential for a range of soil types including sites with tangible and intangible cultural heritage values and noted limitations. This model did not assess the presence or absence of Potential Archaeological Deposits (PADs).

A number of registered historical sites were also identified including Huntly, Weetangera Cemetery, Travelling Stock Route, Cotter Pumping Station Precinct, Greenhills House Ruins and the Mt Stromlo Observatory Precinct.

The preliminary study divided the WEIA into areas of high and moderate sensitivity, and made a series of recommendations for additional work that would be required to understand the values of the landscape. In summary[1]:

- Areas of high sensitivity were identified as unsuitable for residential and commercial development as they are areas of long-term or repeated occupation and social activity or are movement pathways through the landscape.
- Areas of moderate sensitivity may need to be subject to further consideration and investigation approval (i.e., for a Cultural Heritage Assessment relevant to the parcel(s) of land). Areas identified to be of moderate sensitivity may still be unsuitable for development depending on the results of further investigations.
- Areas for further investigation:

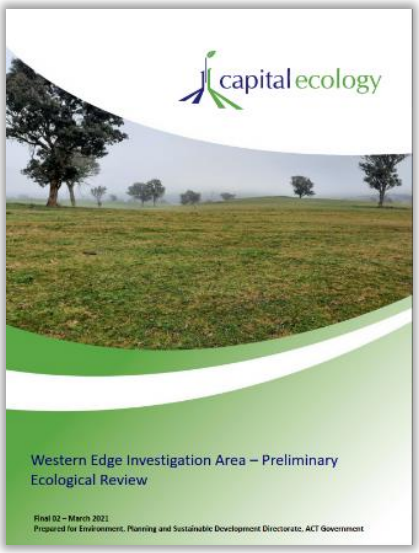
[1] It is noted the GML Heritage (2020) Cultural Heritage Assessment contains sensitive information pertaining to the presence of Aboriginal artefacts within the study area and as a result may need to be redacted from this document in the event this study is publicly released

- Zone 1 – potential for additional Aboriginal Heritage sites based on existing records
- Zone 2 – limited previous heritage assessment, however there is a potential for further sites based on finds

A shapefile of heritage items has been obtained. Focusing the capability and suitability assessment on the location of existing identified Aboriginal heritage places and values presents a biased assessment of the WEIA, as areas that have not been previously surveyed would appear as not having heritage values. In addition, focusing on artefact finds would not adequately consider intangible cultural values such as song lines and spiritually significant places. We understand that the ACT Government is currently undertaking additional studies into the cultural significance of the WEIA and suggest that the outcomes of the WEIA Land Use Capability and Suitability Assessment be revised in time to consider these findings.

Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in restricted Appendix A. Additional Aboriginal places, which are not on the ACT Heritage Register may have been previously recorded in the WEIA. There is no spatial data available on these places so the number, extent and significance of these places is currently unknown. Future development planning will need to consider any information gaps, along with additional heritage assessment in accordance with the operating statutory framework at the time.

Western Edge Investigation Area – Preliminary Ecological Review



This study undertook an initial review of ecological and plant community types present across the WEIA study area. The report noted that current and historic land uses including rural agriculture and commercial plantations have substantially altered the ecological values of much of the area through clearing, cultivation, pasture improvement, grazing, pine plantations and the introduction of exotic flora and fauna.

The study notes that there are a number of significant ecological values that need to be considered and preserved where possible through master planning and land use designations. These areas predominantly occur along the Molonglo and Murrumbidgee River corridors and the central part of the WEIA study area which supports some mature remnant native vegetation with good floristic diversity. The study notes:

- The presence of Critically Endangered Natural Temperate Grassland (NTG) occurring in the northern part of the site.
- Presence of Box Gum Woodland, including potential Critically Endangered Blakely's Red Gum-Yellow Box Grassy Woodland, throughout the study area.
- Threatened flora species were recorded in the WEIA, predominantly clustered around river corridors and identified as Austral Toadflax, Hoary Sunray, Murrumbidgee Bossiaea, Pale Pomaderris, and Small Purple Pea.
- Habitat for threatened Gang-gang Cockatoo, Superb Parrot and Little Eagle is also present, mostly in the central part of the WEIA.
- Habitat for the endangered Rosenberg's Monitor and vulnerable Pink Tailed Worm Lizard (PTWL) were also identified throughout the site. Due to the presence of surface rock throughout the WEIA, PTWL is expected to be reasonably widespread however further survey is required to confirm the quality of habitat.
- Potential for threatened Striped Legless Lizard habitat, requiring further targeted surveys to confirm.
- Potential threatened Golden Sun Moth and Perunga Grasshopper, however further targeted surveys are recommended.
- Potential for Spotted-tailed Quoll and noted sightings in the ACT Wildlife Atlas of Brush-tailed Rock Wallaby, Grey-headed Flying-fox and Koala.
- Potential and confirmed habitat for threatened aquatic species including Murray River Crayfish, Macquarie Perch, Murray Cod and Trout Cod within the Murrumbidgee and Molonglo River systems.

Due to the density of threatened flora and fauna occurring throughout the WEIA, the Capital Ecology report recommends a series of further studies including consideration of key habitat connectivity pathways throughout the site. The report notes that the WEIA is likely to hold both local and regional importance for habitat connectivity and recommends that significant corridors may include:

- Murrumbidgee and Molonglo River corridors
- Area south of the WEIA around McQuoid's Hill Nature Reserve
- South-west and north-west of Mt Stromlo
- Portions of Spring Valley Farm
- Portions of Kama Nature Reserve, Lands End, Pegasus Riding School and Pine Ridge

Based on the connectivity corridors and mapped presence of ecologically significant habitat, the report recommends four potential future conservation/offset sites with areas of EPBC and Nature Conservation Act listed Box-Gum Woodland, NTG and habitat for threatened birds, invertebrates, reptiles.

The mapping from the Capital Ecology report has been incorporated into the assessment undertaken as part of this study to help categorise land that is most suitable for urban development.

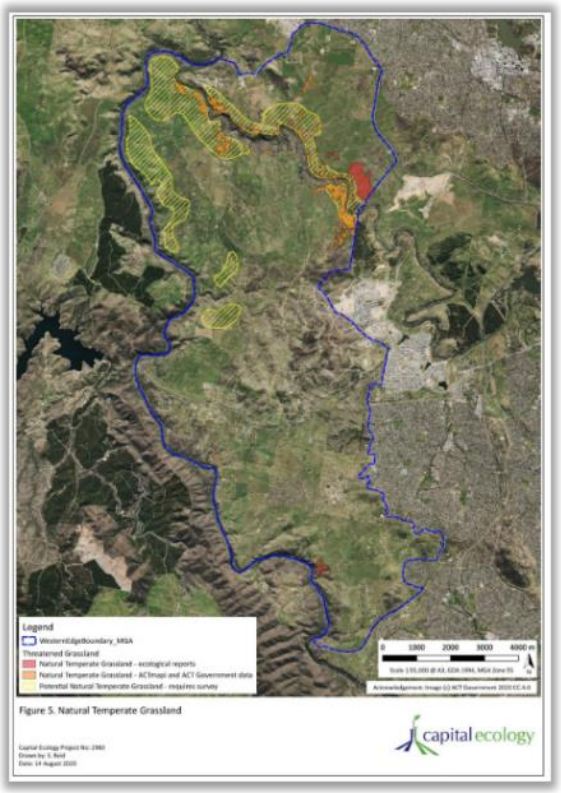


Figure 4-3 | Potential and known locations of Natural Temperate Grassland within the WEIA

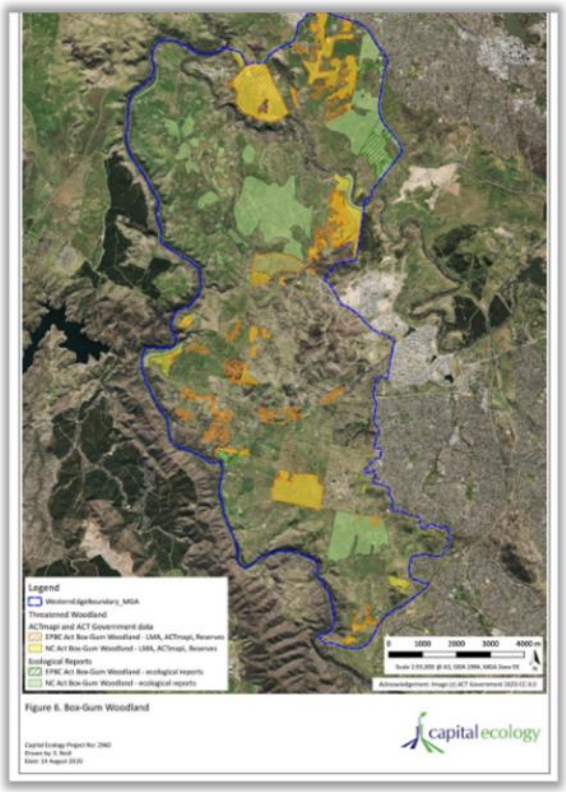


Figure 4-4 | Potential and known presence of EPBC and NC Act listed Box-Gum Woodland

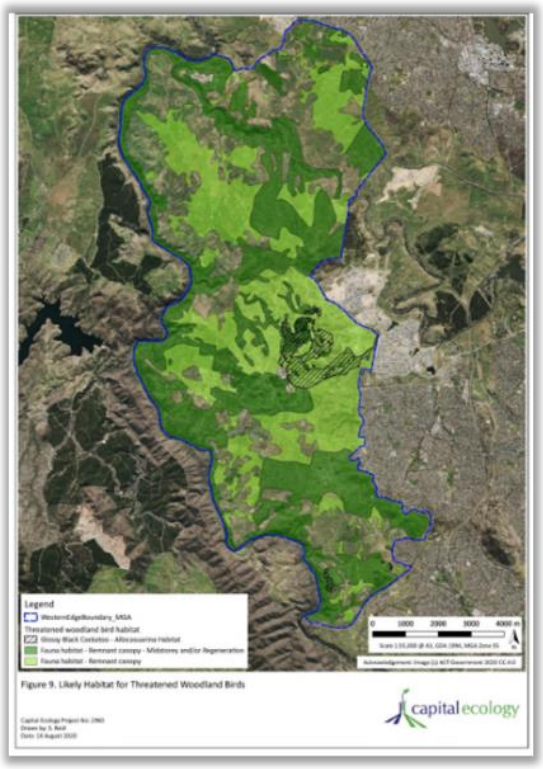


Figure 4-5 | Potential and known habitat for threatened Glossy black Cockatoo

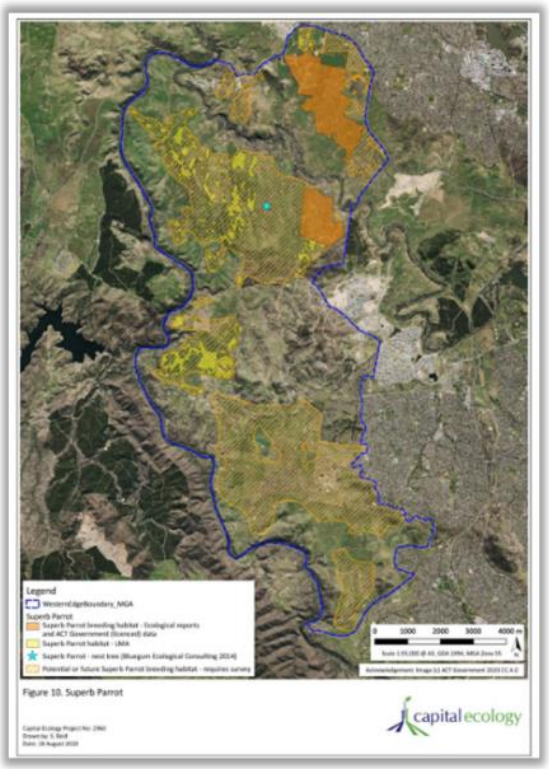


Figure 4-6 | Potential and known habitat for threatened Superb Parrot

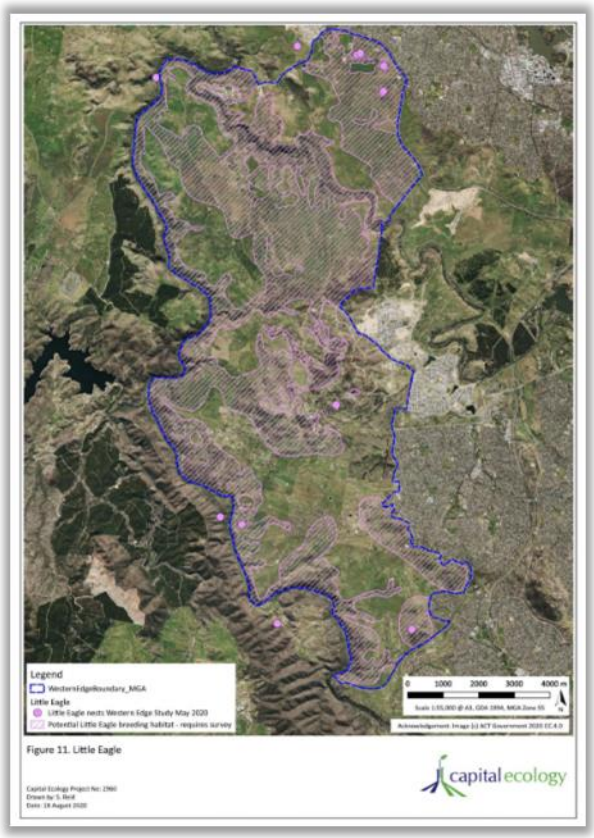


Figure 4-7 | Potential and known habitat for threatened Little Eagle

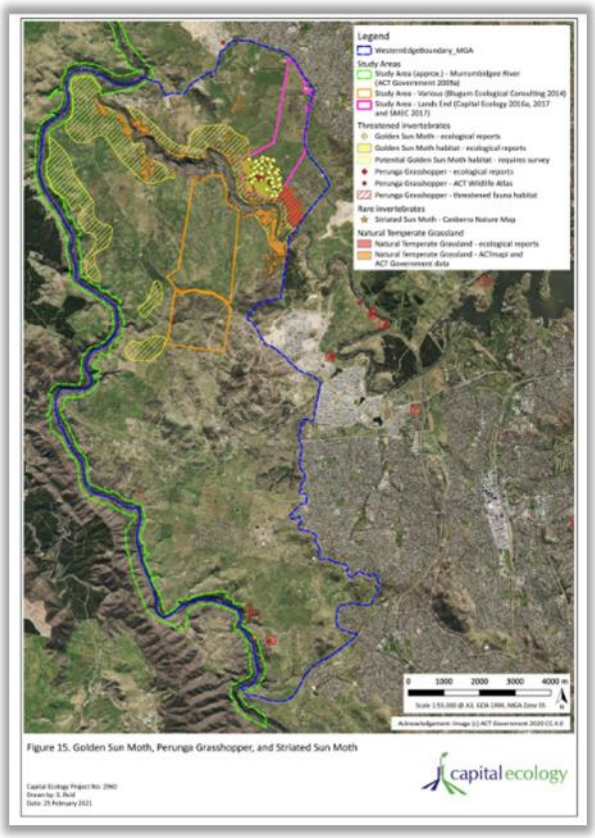
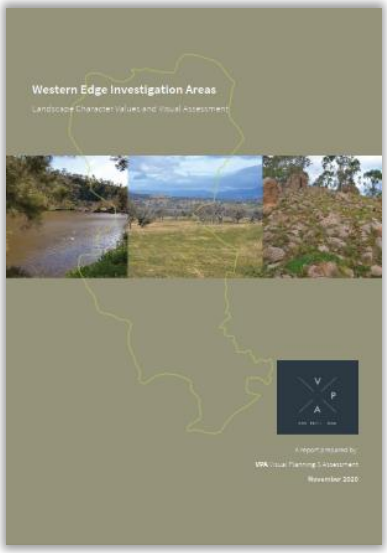


Figure 4-8 | Potential and known habitat for Golden Sun Moth

Western Edge Investigation Area – Landscape Character Values and Visual Assessment prepared by Van Pelt and Allen 2020



This assessment considered existing landscape values, key viewpoints and points of interest and existing road, river and infrastructure corridors. The report notes that the nature of Canberra's topography has meant that the WEIA has formed a natural 'edge', being retained as rural lands and creating a buffer between urban development, and the rivers and mountains beyond.

The assessment produced two preliminary outputs, mapping 'scenic amenity' and 'scenic priority' throughout the WEIA. A series of 'scenic values' were then developed to provide a quantitative assessment denoting areas of higher rural landscape integrity due to the continuity of the landscape and extent of visibility from existing developed areas; and suggestions for areas which have a high visual absorption capability, due to topography and lower visibility.

Six options for potential development nodes were identified in the report, and have been considered in the Suitability assessment undertaken for this project. The mapping notes areas as having higher visual absorption capacity: Spring Valley Farm within the central part of the WEIA and to the west of Denman North; two areas in the south of the WEIA, west of Chapman toward Kambah Pool Road; an area adjacent to development in West Belconnen and two smaller areas located to the west of Mount Stromlo. The report notes that the visual absorption of the WEIA can be increased by screening new development with strategically located tree planting and filtering views through vegetation.

The capability assessment has drawn upon the scenic priority values shown in Figure 4-9 that were established in the visual impact assessment, to assess areas which offer better visual absorption (lower scores) and that may be more suited for urban development.

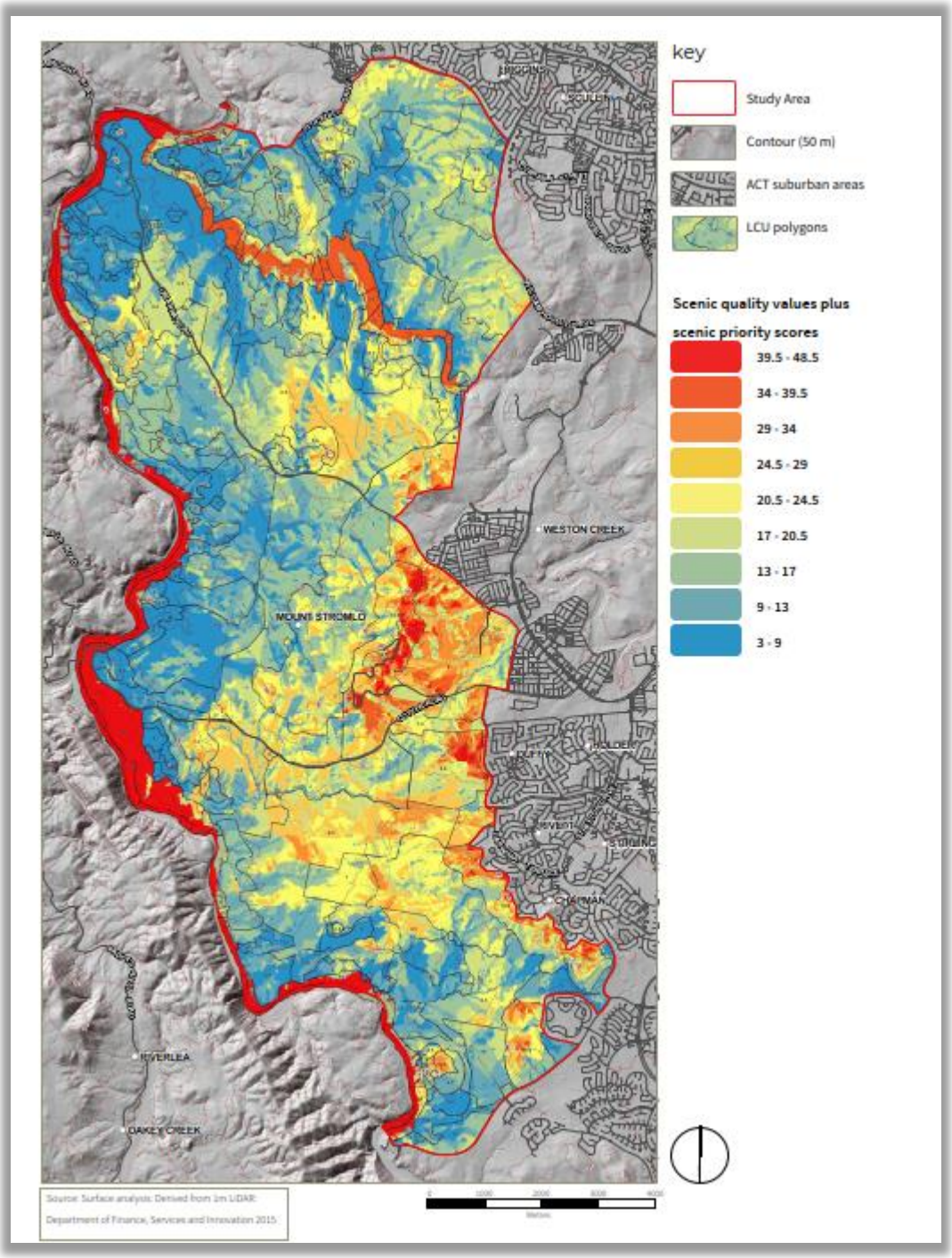
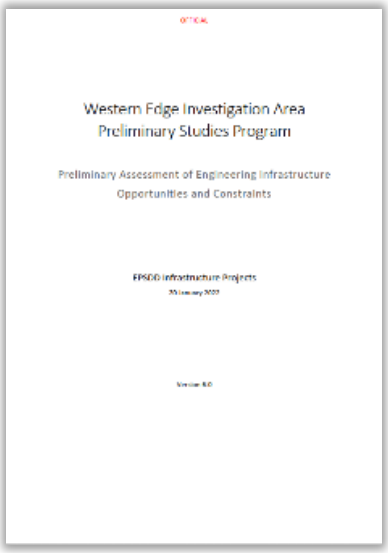


Figure 4-9 | Scenic Values (source: VPA 2020)

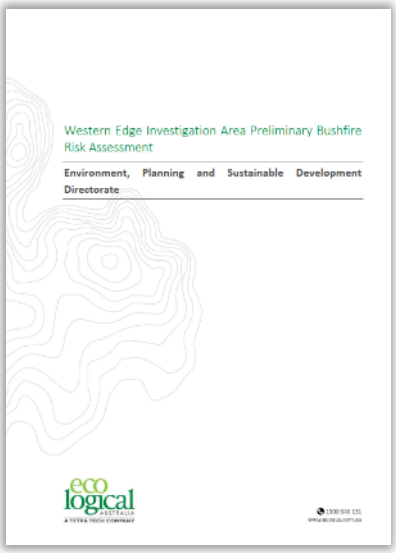
Western Edge Investigation Area – Preliminary Assessment of Engineering Infrastructure Opportunities and Constraints, EPSDD 2022



This preliminary report provides an assessment of the presence of existing infrastructure within the WEIA, confirming key areas of risk and uncertainty. Of particular note, the report confirms:

- The need to consider transport corridors east-west and north-south of the developable areas. There may be potential need to cross the Molonglo River and undertake substantial upgrades to existing roads to support additional density in the WEIA.
- Topography creates challenges for servicing the site, and suggestions of options such as an on-site sewerage treatment plant, pump station linking to LMWQCC and a new gravity sewer (via a bridge) to LMWQCC. Servicing costs may impact development feasibility.
- The need to manage sewer odours and noise from the Molonglo Valley Interceptor Sewer (MVIS) and LMWQCC and consider appropriate siting for future urban areas.
- The need to consider how stormwater flows are managed within the future urban areas, noting the need to manage both quality and quantity of flows before discharge into the Molonglo and Murrumbidgee River systems.
- The need to consider the potential to reuse stormwater to reduce potable water demand.
- The need to source appropriate locations for water reservoirs to service future development in the area.
- Consider the location of existing TransGrid infrastructure in the WEIA, and whether relocation may be needed.
- Note the five-year regulatory timeframe for Evo Energy to raise funds to plan for the construction of new infrastructure. The need to consider the availability of existing power supply and capacity, noting planned projects in the Molonglo Valley.

Western Edge Investigation Area – Preliminary Bushfire Risk Assessment, Ecological 2020



This bushfire risk assessment provides the level of bushfire risk and includes recommendations to inform land use considerations. Key considerations include:

- Assessment of bushfire risk
- Compliance with relevant ACT policies including the ACT Strategic Bushfire Management Plan Version 4 2019-2924
- Minimising reliance on performance based solutions
- Providing infrastructure to support evacuation and firefighting
- Facilitating ongoing land management practices.

The report notes that re-vegetation along river corridors will provide an additional fuel source that will need to be appropriately managed through urban form and asset protection zones (APZs). Grassland fires are most likely to come from the north, east and south, and provide a high risk to the WEIA, due to their higher ignition and rate of spread. Forested areas to the south-west of the WEIA area present the largest fuel load, however the downhill topography toward the Murrumbidgee River may slow the spread of fire. Overall, the report suggests that the 'perimeter to area' ratio of the WEIA is low, noting that about a quarter of the boundary of the WEIA does not interface with bushfire prone land. This means that bushfire risk is manageable and that over 95% of future development may be able to be classified as Bushfire Attack Level (BAL) LOW.

The capability assessment will utilise the bushfire risk category assessment, which considers slope and vegetation type to confirm the likely bushfire risk across the WEIA. It is important to note that this does not consider bushfire hazard, threat to life or property, or the potential to safely evacuate. These matters will be considered qualitatively in the suitability assessment, alongside climate change and resilience given the potential impact of extended and harsher bushfire seasons.

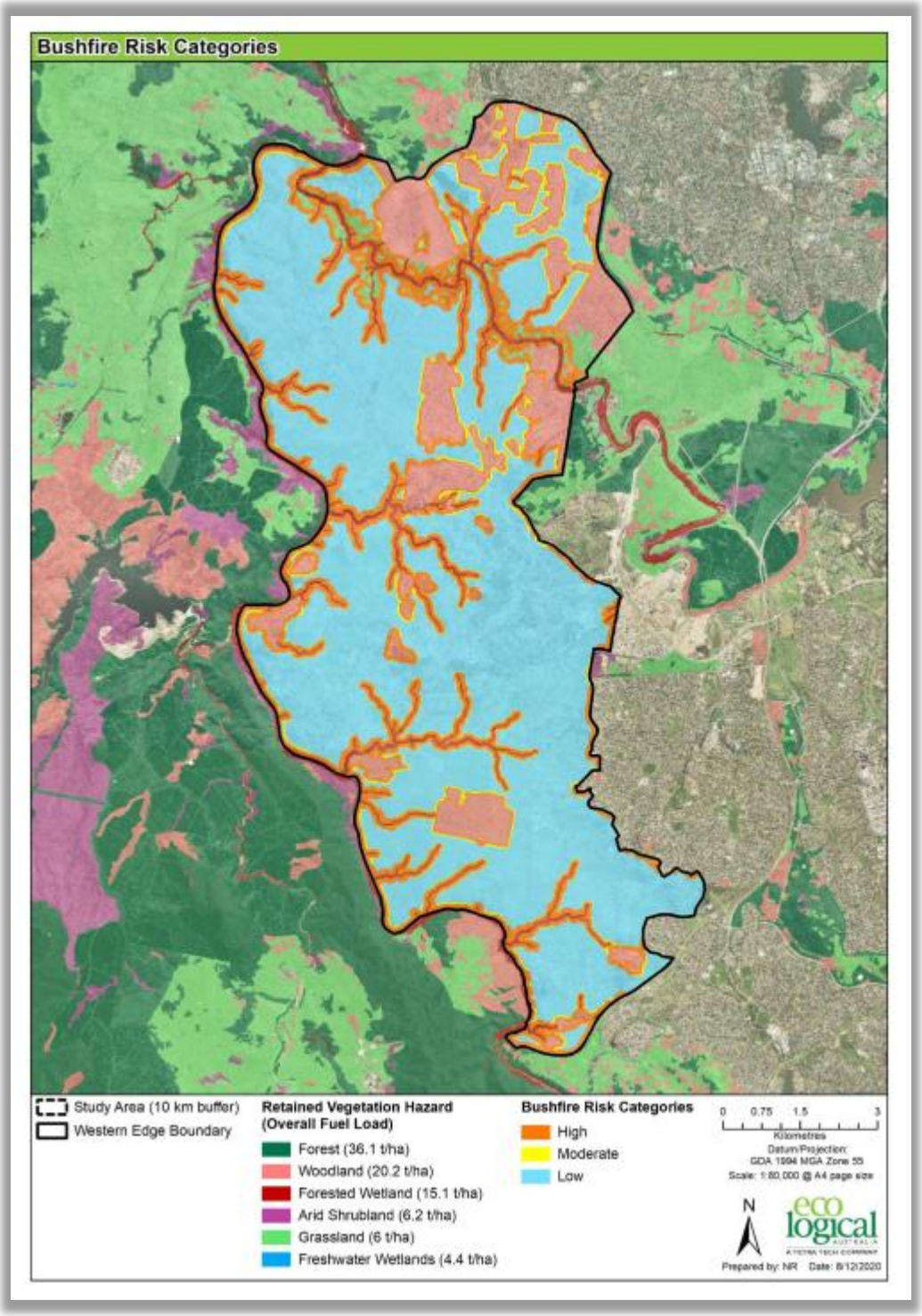


Figure 4-10 | Bushfire Risk Assessment (source: Ecological, 2020)

4.2 Constraints Analysis

The following figures provide an analysis of key infrastructure assets and networks within and surrounding the WEIA. These are intended to provide an overview of site constraints and opportunities, for further exploration in the Land Capability and Suitability Assessment.

Access into the WEIA from the existing road network presents a key consideration for servicing and extension of the road network, as well as connectivity into active travel and public transport networks. Uriarra Road provides a single carriageway connecting to the arterial network at John Gorton Drive. Cotter Road provides a single carriageway with

east-west connectivity to the WEIA, extending west from John Gorton Drive to Mount Stromlo and providing access to a number of rural properties and equestrian uses.

Kambah Pool Road provides access to the southern boundary, whilst the western extent of Hindmarsh Drive, Duffy, provides potential east-west connectivity through to the districts of Weston Creek and Woden. William Hovell Drive and Drake-Brockman Drive extend along the north-eastern portion of the WEIA, providing potential connectivity to Belconnen and recent development in West Belconnen.

Icon Water infrastructure in the WEIA comprises sewer infrastructure in the northern portion of the site, and bulk water supply along Cotter Road. The significant Icon Water potable water assets in the area include a 1350mm bulk water supply main which runs from the Cotter Dam intake to the Mount Stromlo Water Treatment Plant, and then pumps potable water via bulk mains to reservoirs throughout Canberra for reticulation. The Molonglo Valley Interceptor Sewer (MVIS), a 2500mm gravity main, connects southern Canberra with the LMWQCC. Reticulation networks for sewer and water are shown within adjoining suburban areas in developed Canberra however do not presently extend into the WEIA.

Energy supply infrastructure within the region includes a 330KV transmission line, part of the Transgrid operated national grid, which runs north-south through the WEIA. It is anticipated that this would be placed within a 60m wide easement in the future, if the WEIA were to be developed. There is no existing easement where the infrastructure is located on unleased land. This transmission line connects to the Canberra Substation in Holt (Block 1559 Belconnen). An Evo Energy owned 132Kv line extends from the Canberra Substation, and traverses through the northern portion of the site, parallel to Drake-Brockman Drive. Lower voltage infrastructure is also present within the WEIA, however could be relocated or undergrounded to accommodate future development.

Gas connections within the WEIA are present connecting to the Mount Stromlo Observatory, Mount Stromlo Water Treatment Plant and the LMWQCC. Whilst the ACT Government has committed to no new natural gas connections to greenfield residential development from 2021-2022, it is likely that these existing connections will need to be retained to service existing infrastructure uses.

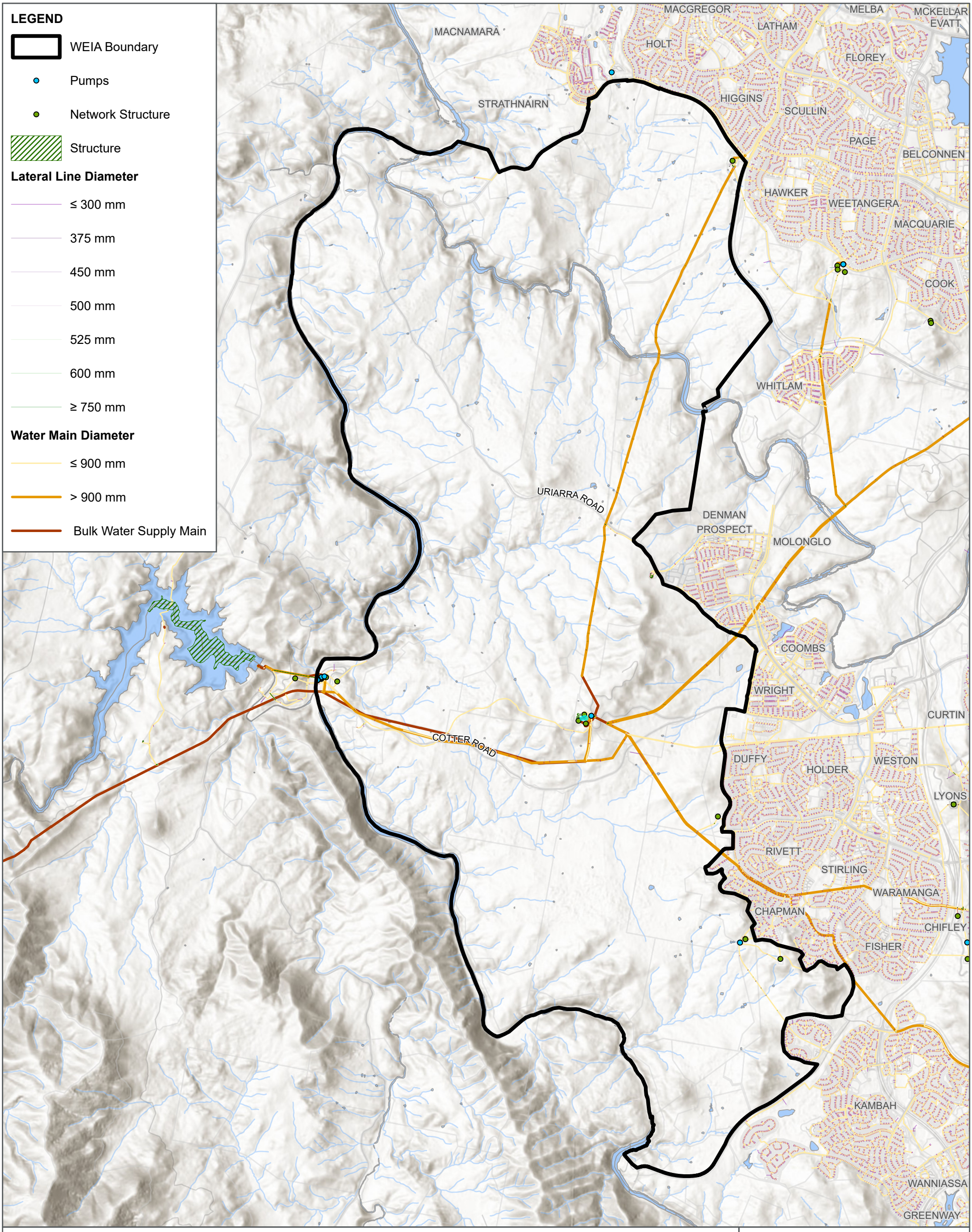


FIG NO. 4-11

FIGURE TITLE Icon Water Infrastructure Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Icon Water, Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory. World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM GDA2020 MGA Zone 55

SMEC

Member of the Surbana Jurong Group

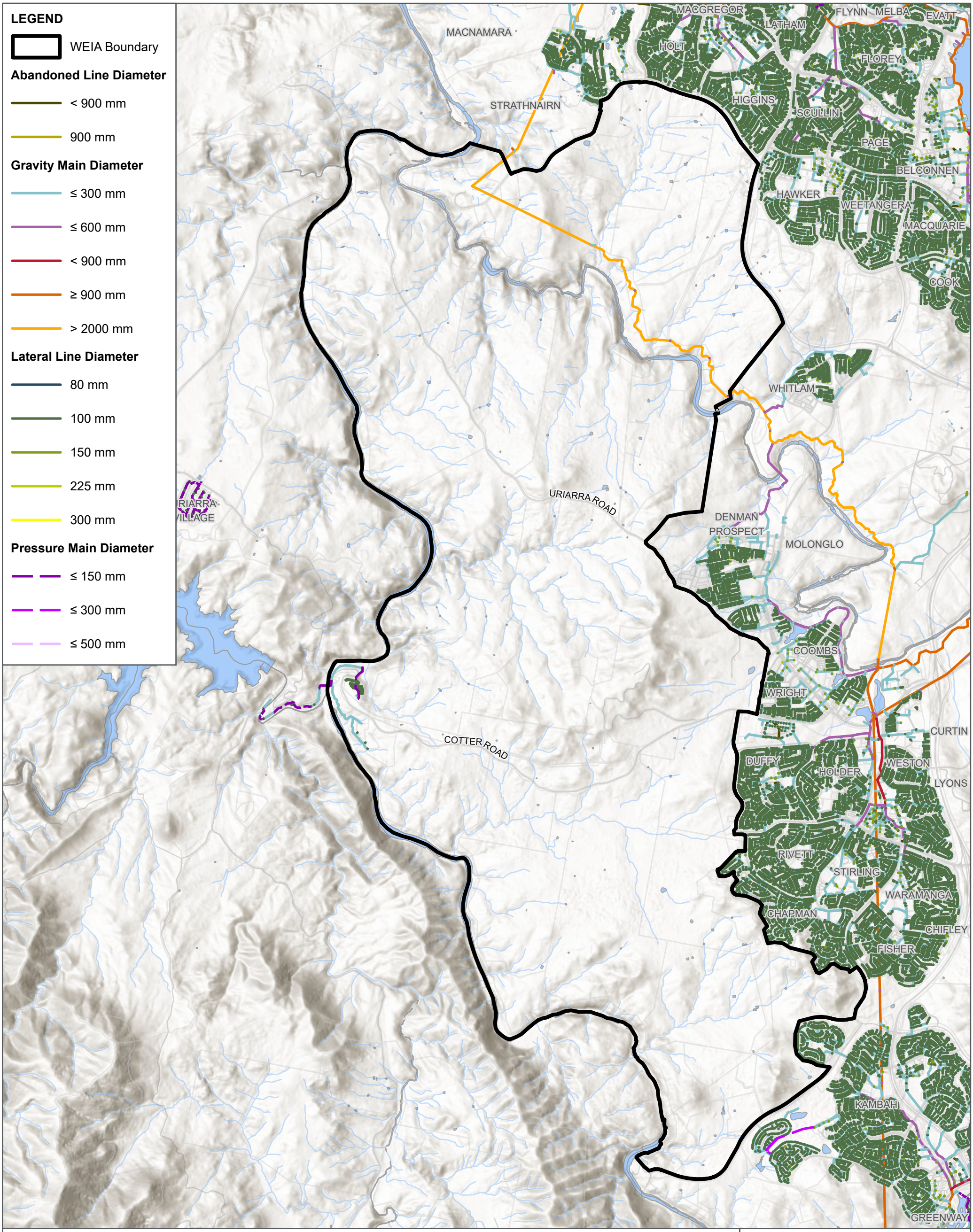


FIG NO. 4-12

FIGURE TITLE Sewer Infrastructure Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

PAGE SIZE A3

SOURCES Icon Water, Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory. World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

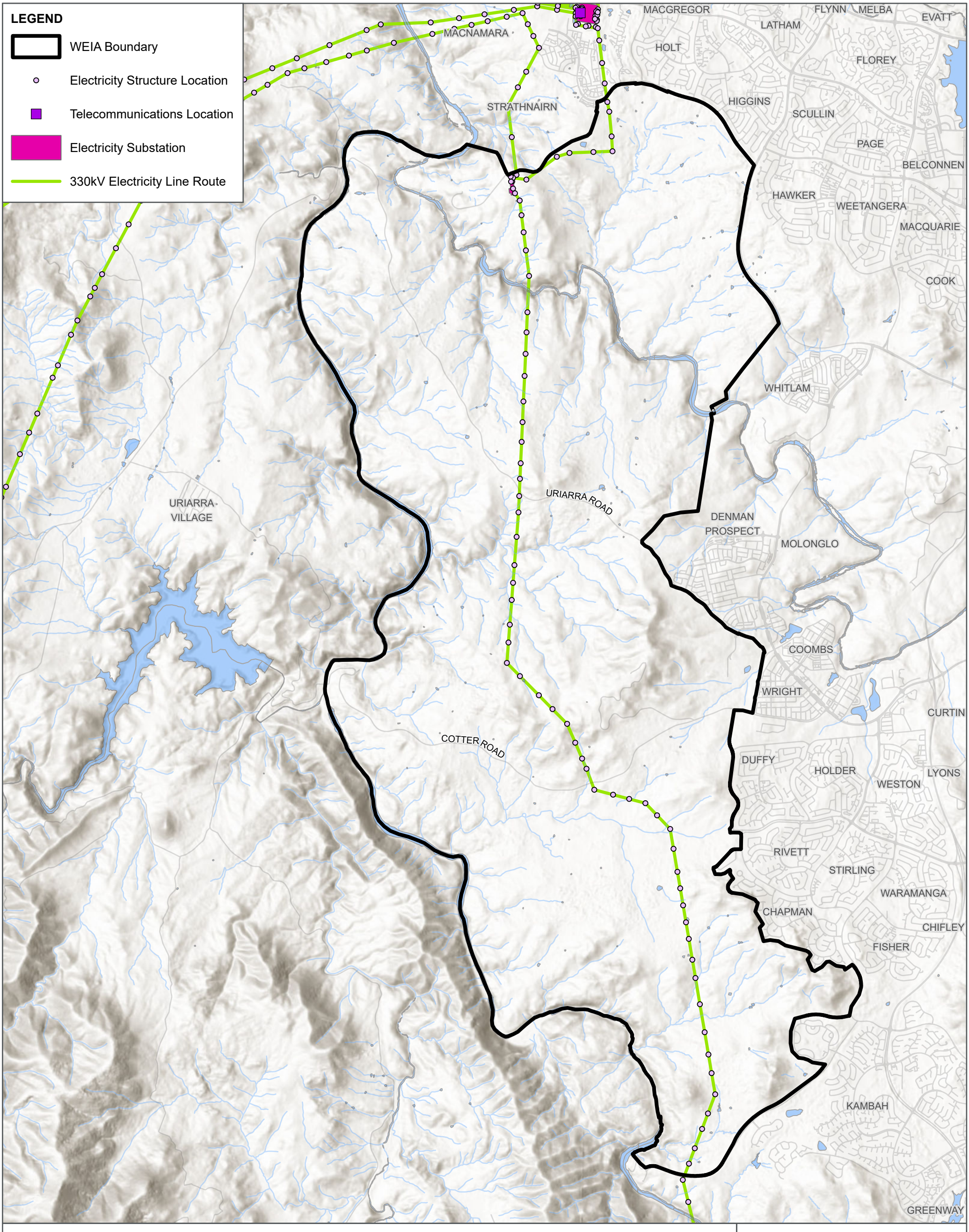


FIG NO. 4 -13

FIGURE TITLE Transgrid Infrastructure Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Transgrid, Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory. World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM GDA2020 MGA Zone 55

SMEC

Member of the Surbana Jurong Group

Location: C:\GIS\NSW\Outgoing\3002862 Western Edge Investigation Area\02_Maps\WEIA Urban Planning\Utilities Maps\Utilities Maps.aprx

Last updated by: LL16284 on 14/12/2022 at 17:29

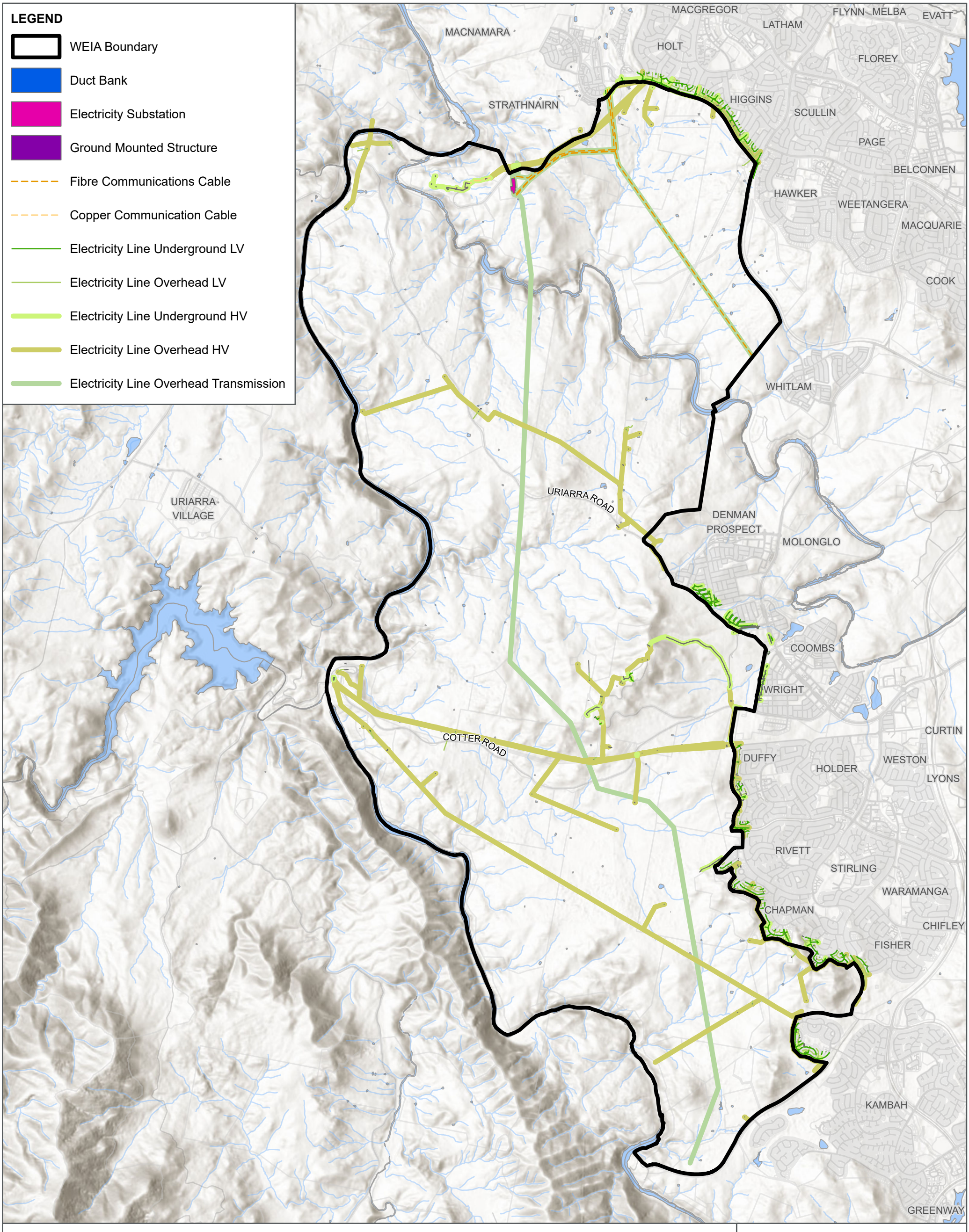


FIG NO. 4-14

FIGURE TITLE Evo Energy Infrastructure Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Evo Energy, Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory. World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM GDA2020 MGA Zone 55

SMEC

Member of the Surbana Jurong Group

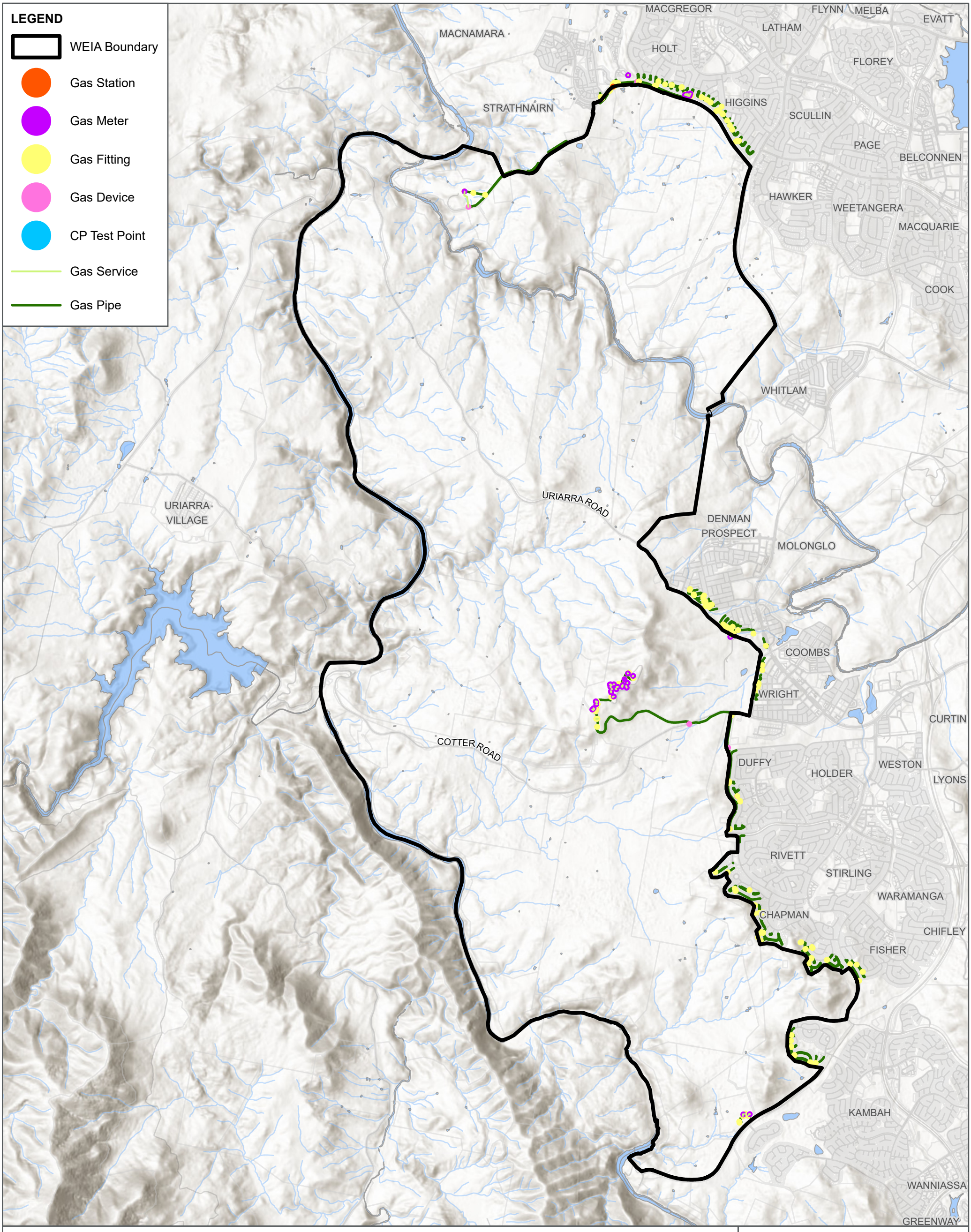


FIG NO. 4-15 **FIGURE TITLE** Gas Infrastructure Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3 Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

5. Stakeholder Engagement

The project's engagement approach was underpinned by the International Association of Public Participation (IAP2) Spectrum of Public Participation. The IAP2 spectrum identifies the level of influence stakeholders can have on a project, with the spectrum extended from 'inform' through to 'empower'. SMEC sought to 'empower' and 'collaborate' with key agency stakeholders (within EPSDD) during the course of the WEIA Land Capability and Suitability Assessment.

Table 5–1 | IAP2 Public Participation Spectrum

IAP2'S PUBLIC PARTICIPATION SPECTRUM

The IAP2 Federation has developed the Spectrum to help groups define the public's role in any public participation process. The IAP2 Spectrum is quickly becoming an international standard.

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

5.1 Identified Stakeholders

Key internal stakeholders for the WEIA Project include key sections of EPSDD involved in the policy development, planning and delivery of future development in the ACT. These key sections of EPSDD are represented in the Project Control Group (PCG) who were invited to the four stakeholder engagement workshops and one field visit that were held throughout the project. Key contacts within ESPDD include:

- Steven Gianakis, Senior Director, Strategic Planning & Reform, Planning and Urban Policy
- Karen Wright, Director, Strategic Planning & Reform, Planning and Urban Policy
- Patrick Paynter, Senior Director, Development and Implementation
- Rosie Cooney, Senior Director, Conservation Research, Environment Heritage and Water
- Greg Baines, Senior Conservation Officer, Environment Heritage and Water
- Eliza Larson, Conservator Liaison, Environment Heritage and Water
- Daniel Santosuosso, Project Director, Development and Implementation
- Claire Adams, Planning Policy Officer, Strategic Planning & Reform, Planning and Urban Policy
- John Wildermuth, Infrastructure Officer, Infrastructure Projects

- Brett Howland, Senior Ecologist, Conservation Research
- Lisa Evans, Aquatic Ecologist, Conservation Research
- Julia Maskell, Conservation Officer, ACT Heritage

Key external stakeholders for the WEIA Project included utility asset owners such as Icon Water, Transgrid and Evo Energy. SMEC engaged with these stakeholders via email or MS Teams, as needed, throughout the project, to obtain an understanding of their existing utility networks. Key contacts within these external agencies include:

- Tim Elliot, Senior Technical Advisor, Icon Water
- Michael Platt, Development Assessment Control Advisor – Transgrid
- Rebecca Beasley, Development Coordination, Evo Energy

5.2 Potential engagement issues and risks

Table5–2 identifies potential project stakeholder engagement issues and risks, as well as the proposed measures the project team undertook to mitigate the risk.

Table5–2 | Engagement Risks and Mitigation Measures

Issue	Risk	Mitigation
Lack of stakeholder understanding about project benefits	Stakeholders do not support the WEIA Project or are disengaged during workshops. May delay delivery of project, or withhold key information on existing constraints.	Implement engagement approach that promotes the need for and benefits of the project. Tailor communication channels and adapt to different stakeholders depending on their needs. Managed expectations by closing the feedback loop and sharing results through project updates and communications. Invited technical involvement through PCG workshops.
Ineffective engagement with stakeholders.	Low levels of stakeholder engagement with project. Stakeholders unaware of project.	Confirmed engagement approach prior to planned sessions via a ‘dry run’ with the project team. Ensured engagement sessions were informative but also included key activities to provide opportunities for collaboration. Applied continuous improvement and regularly evaluated engagement activities/tools and their effectiveness.
Inconsistent project messaging and information.	Distrust or confusion amongst stakeholders. Negative reputational impact.	Sought technical input to complex technical aspects of communication material for accuracy. Involved key technical team members throughout the workshops, as appropriate, to facilitate technical discussions.
Lack of acceptance and stakeholder disapproval of the project.	Negative reputational impact. Stakeholders do not accept need for or outcomes of the WEIA Land Capability and Suitability Assessment.	Provided early and consistent engagement for stakeholders. Built trust and rapport with stakeholders through transparent and responsive engagement. Monitored and reported on issues raised and closed the feedback loop.
Stakeholder feedback not passed back to project team.	Stakeholders do not support the proposal and do not feel their input was valued.	Tracked stakeholder interactions and all issues raised in a Comments Register.

Issue	Risk	Mitigation
		Provided regular updates and facilitated discussions with project team. Closed feedback loop by sharing outcomes with stakeholders.
Negative political or media attention regarding the project.	Reputational risk. Project delayed or outcomes modified during delivery due to political influences.	Maintained confidentiality of the project. Directed any media enquiries to EPSDD. Provided a clear English 'Snap Shot' at the conclusion of the project that can be used to brief political stakeholders and/or the public.
Insufficient evidence, information or data	Stakeholders are unable to make well informed comments.	Identified gaps, or where more information was required, reassured stakeholders that future further investigations will be undertaken to fill in the gaps. A planning process is long term by its nature and there will be many years prior to confirming if any area could be developed.

5.3 Engagement Tools

Table 5–3 below outlines the communication and engagement tools that were used by SMEC during project delivery to consult with stakeholders and promote collaboration and engagement.

Table 5–3 | Proposed Engagement Tools

Activity	Purpose	Tool	Attendees	Timing
Stakeholder Workshop 1	Land Capability Assessment Establish MCA Criteria	Workshop GIS Mapping Group activity to establish MCA criteria	PCG and SMEC	26 May 2022
Stakeholder Workshop 2	Land Use Areas and Boundaries	Workshop GIS Mapping Group activity to confirm key parameters for suitability assessment	PCG and SMEC	28 June 2022
Field Visit	Site understanding	Use of georeferenced mapping program (Avenza) Site visit and discussions	PCG and SMEC	28 June 2022
Stakeholder Workshop 3	Land Suitability Assessment	Workshop and group activities to confirm zoning and vision	PCG and SMEC	28 July 2022
Stakeholder Workshop 4	Scenario development / Strategic Merit Test	Workshop and Strategic Merit Test of indicative development scenarios	PCG and SMEC	1 September 2022
Project Snapshot	Fact sheet will cover topics such as project need, findings and recommendations.	Fact Sheet	N/A	Conclusion of project

6. Land Capability Assessment

6.1 Methodology

The Land Capability Assessment was based on the physical and environmental characteristics of the study area, as extracted from previous studies and data obtained from utility owners. Table 6–2 confirms the criteria that was used in the capability assessment, which was based on the key desirable characteristics for urban development. The intent of this assessment was to undertake an initial quantitative analysis of the capability of the WEIA, with more detailed qualitative considerations in the suitability assessment.

For each of the criteria, the following ranges of suitability (or "ratings") were assigned as defined in Table 6–2. The spatial outputs of these ratings were displayed as:

- **Rating 1 – Least Constrained**

Land that is potentially developable with little or no intervention.

- **Rating 10 - Somewhat constrained – Pink**

Land that is potentially developable with minor intervention and investment. This land is characterised by some constraints that may feature some costs to mitigate or manage, or may impact the type of use possible.

- **Rating 20 – Constrained – Yellow**

Land that is potentially developable, however still has a number of physical constraints.

- **Rating 40 – Highly Constrained – Orange**

Land that may be more difficult to develop due to environmental or ecological constraints.

- **Rating 200 – Very Highly Constrained – Red**

Land that is potentially undevelopable or requires very significant intervention and investment. This land is characterised by significant constraints that may be costly to mitigate or manage.

- **Rating 9999 – Area of Restriction 'Excluded' - Grey**

Land that may be unsuitable for urban development, based on identified constraints. This is land that is within the river corridor or an existing or planned nature reserve. The Stromlo Observatory and Stromlo Forest Park were also areas of restriction that were excluded.

Six ratings were selected to give appropriate sensitivity to the rating of each criteria. A higher number of ratings would not give such a defined output, and fewer may oversimplify the impacts of constraints assessed.

6.2 Relative Weightings

The relative weightings adopted in the Capability Assessment were developed in consultation with the PCG at the first stakeholder workshop. Criteria were given a score out of ten, with a relative percentage weighting created. This is shown in Table 6–1. Adopting a relative weighting provided an opportunity to undertake a sensitivity assessment and ensured that some attributes that occur throughout the WEIA did not overly dominate the capability analysis from a mathematical perspective.

Table 6–1 | Raw and weighted scores for Capability Assessment

Criteria	Raw Score	Relative Weighting
Interface with adjoining land uses	6	13%
Slope and Soils	5.5	12%
Waterways and waterbodies	8	17%
Vegetation and Habitat	9.5	21%
Bushfire Hazard	7	15%
Road Access and Infrastructure	6	13%
Visual Impact	4	9%
TOTAL	46	100%

Table 6–2 | Assessment Criteria for Land Capability Assessment

Criteria	Justification	Rating						Relative
		9999 Areas of Restriction 'Excluded'	200 Very Highly Constrained	40 Highly Constrained	20 Constrained	10 Somewhat Constrained	1 Least Constrained	Weighting
Interface with adjoining land uses	▪ To avoid incompatible adjacent uses ▪ Consideration of existing and future development approvals for conflicting land uses ▪ To ensure site is not within or adjacent to area designated for alternative incompatible use ▪ To avoid designated land	NUZ4 – River Corridor Nature Reserve Overlay Stromlo Observatory Stromlo Forest Park LMWQCC Stromlo WTP		Designated Areas NUZ3 – Hills Ridges and Buffers Within 2.4km of LMWQCC Within ANU's Stromlo Observatory Non-development Buffer	500m or further from land zoned FUA, RZ1/RZ2/RZ3 Within NCA's Stromlo Observatory Light Limitation Zone (5km)		-	13
Slope and Soils	▪ To minimise risk of erosion and slope stability, cost of construction and low accessibility and serviceability ▪ To avoid areas that are identified in the geotechnical assessment as presenting a risk to development	Water logged Highly Erodible soils	Rocky Outcrop	Burra soil landscape Slope 20%+	Slope 15% to 20%	-	Campbell soil landscape	12
Waterways and waterbodies	▪ To minimise impacts on water bodies and waterways and reduce flood impacts ▪ To protect key waterways and tributaries ▪ To appropriately manage interaction between hydrology, soils and slopes	NUZ4 River Corridor	Stormwater Buffer (Alluvium Report)	-	-	Remainder of the site	-	17
Vegetation and Habitat	▪ To maintain important biodiversity corridors (connectivity) ▪ To avoid and minimise impacts on biodiversity, including threatened species and ecological communities	NUZ4 – River Corridor Nature Reserve Overlay Blocks 402 and 403 Stromlo	Critically Endangered Species	Concentration of multiple listed species in the same place Connectivity linkages between core habitat				21
Bushfire Hazard	▪ Minimise risk of bushfire hazard ▪ To protect assets (public and private) through appropriate management and maintenance ▪ To consider constraints of future climate ▪ To establish safe evacuation routes		High Bushfire Risk	-	Moderate Bushfire Risk		Low Bushfire Risk	15
Road Access and Infrastructure	▪ To ensure access to site is possible via existing road network ▪ To note where the presence of large regional assets such as transmission lines may restrict development feasibility if augmentation or relocation is required ▪ To ensure future development is serviceable ▪ To consider the cost of infrastructure connections ▪ To provide and integrate efficient (cost-effective and responsive) infrastructure networks ▪ To establish Multi-use/flexible infrastructure corridors	Icon Water Structures LMWQCC Stromlo WTP	> 2 kms from existing water / sewer / power pipe with diameter of < 900mm Transgrid HV 300Kv Transmission lines + 60m buffer MVIS sewer +10m buffer, bulk water supply main + 10m buffer	> 1km from a public road	-			13
Visual Impact	▪ To protect scenic amenity values (rural and heritage settings) ▪ To protect visual amenity from prominent vantage points, as described in the Preliminary Landscape Values and Visual Impact assessment undertaken ▪ To protect riparian zones ▪ To minimise clearing	Scenic Priority Score from Visual Impact Assessment > 39.5		Scenic Priority Score from Visual Impact Assessment 29 to 39.5	Scenic Priority Score from Visual Impact Assessment 20.5 to 29	Scenic Priority Score from Visual Impact Assessment 13 to 20.5	Scenic Priority Score from Visual Impact Assessment 3 to 13	9
						TOTAL		100

6.3 Capability Assessment Results

This section provides an analysis of the results of the Land Capability Assessment and is informed by the following outputs:

- A separate map of each criteria showing relevant data across the WEIA
- Individual assessments of each criteria classifying the data according to the ratings in the capability assessment
- A combined capability assessment, bringing together the individual assessments and analysing the data using the relative weightings.

6.3.1 Interface with adjoining land uses

Figure 6-1 provides the baseline assessment of current zonings, land uses and overlays under the Territory Plan and National Capital Plan. The WEIA includes significant nature reserves within the Molonglo and Murrumbidgee River Reserves and in nature reserves such as McQuoid's Hill and Cooleman Ridge. It is also understood that Block 402/403 Stromlo (currently zoned NUZ3-Hills Ridges and Buffers) has significant ecological value as a future nature reserve. The assessment 'excludes' nature reserves as inappropriate areas for future development and extends this exclusion to Block 402 and 403 (also identified as Blewitts Block).

Stromlo Forest Park is a significant community asset and has been identified as an area of restriction and as such 'Excluded' in the capability assessment, owing to the presence of community infrastructure and its ongoing value to the wider community. The intended future use of Stromlo Forest Park is reflected in the Stromlo Forest Master Plan. Future compatible uses such as short-term commercial accommodation or further community infrastructure could be considered on the site, to support tourism and community needs.

The analysis adopts a 'highly constrained' rating in the 2.4km buffer around the LMWQCC and the two buffers which are present in the National Capital Plan around the Mount Stromlo Observatory: the "Non-Development Buffer" and the 5km "Stromlo Observatory light limitation zone". It is understood that Icon Water are currently investigating the management and processing of biosolids at the LMWQCC. Investment in infrastructure at LMWQCC may result in changes to impacts, and a reduced buffer being more appropriate. For this reason, it was determined not to exclude development within the buffer around the LMWQCC. As master planning progresses, further consultation with the Observatory and Icon Water is recommended to understand how impacts can be mitigated within these buffers, through design responses such as orientation, lighting luminance or land use.

Designated Land and land zoned as NUZ3 – Hills, Ridges and Buffers under the Territory Plan was identified as 'highly constrained'. This is indicative of the potential challenges of development in these areas due to high visibility, and/or areas which may have been zoned to provide open spaces and undeveloped vistas from the urban areas of Canberra. Whilst development of these areas is not impossible, consideration of appropriate urban development, scale and landscaping would be required to ensure the key elements of the Walter Burley Griffin plan are respected. The suitability assessment takes a qualitative approach and looks into such matters in further detail.

As shown in Figure 6-2, the capability assessment shows that the most urban capable land is located directly west of existing development in Weston Creek and south-east of development in West Belconnen. A pocket of less constrained land is also noted north of Kambah Pool Road, with an area in the north-west of the WEIA, extending along Uriarra Road.

6.3.2 Slope and soils

Figure 6-3 provides the baseline assessment of the soils present across the site. This has been informed by the previous geotechnical assessment undertaken by AECOM (2020). The slope analysis has been developed using LiDAR data, to build a digital elevation model (DEM) and provide approximate slope gradients. Areas with steep or waterlogged terrain and rocky outcrops were rated as harder to develop in the analysis.

Figure 6-4 provides the capability assessment for this criteria. This indicates that the most urban capable land, based on this thematic layer only, is isolated in the southern portion of the site, directly west of existing development in the Molonglo Valley and Woden Valley and adjacent to Kambah.

6.3.3 Waterways and waterbodies

As shown in Figure 6-5 and Figure 6-6, the data used for the waterways and waterbodies criteria designates areas within the river corridor as an area of restriction that has been excluded and areas within the stormwater management buffer (suggested in the Alluvium Report discussed in Section 4.1) as very highly constrained. The remainder of the site is shown as 'somewhat constrained', but potentially acceptable for future development. It is noted that many of these areas are also within nature reserves, so were also excluded in the land use assessment.

Given the number of existing waterways within the WEIA, and the proximity to ecologically sensitive habitats in the Murrumbidgee and Molonglo River systems, any form of future development will need to be water cycle sensitive. This could be managed through WSUD and at-source treatment systems, ensuring post development flow does not increase discharge volumes to receiving waterways, appropriately managing water quality in the urbanised catchments and ensuring ecologically important ephemeral waterways are retained as habitat areas, by basing urban development around naturally occurring waterways. Redevelopment of

the area also presents opportunities for improving the quality of receiving waterways by reducing erosion within the catchment and providing at-source treatment of runoff from urbanised areas.

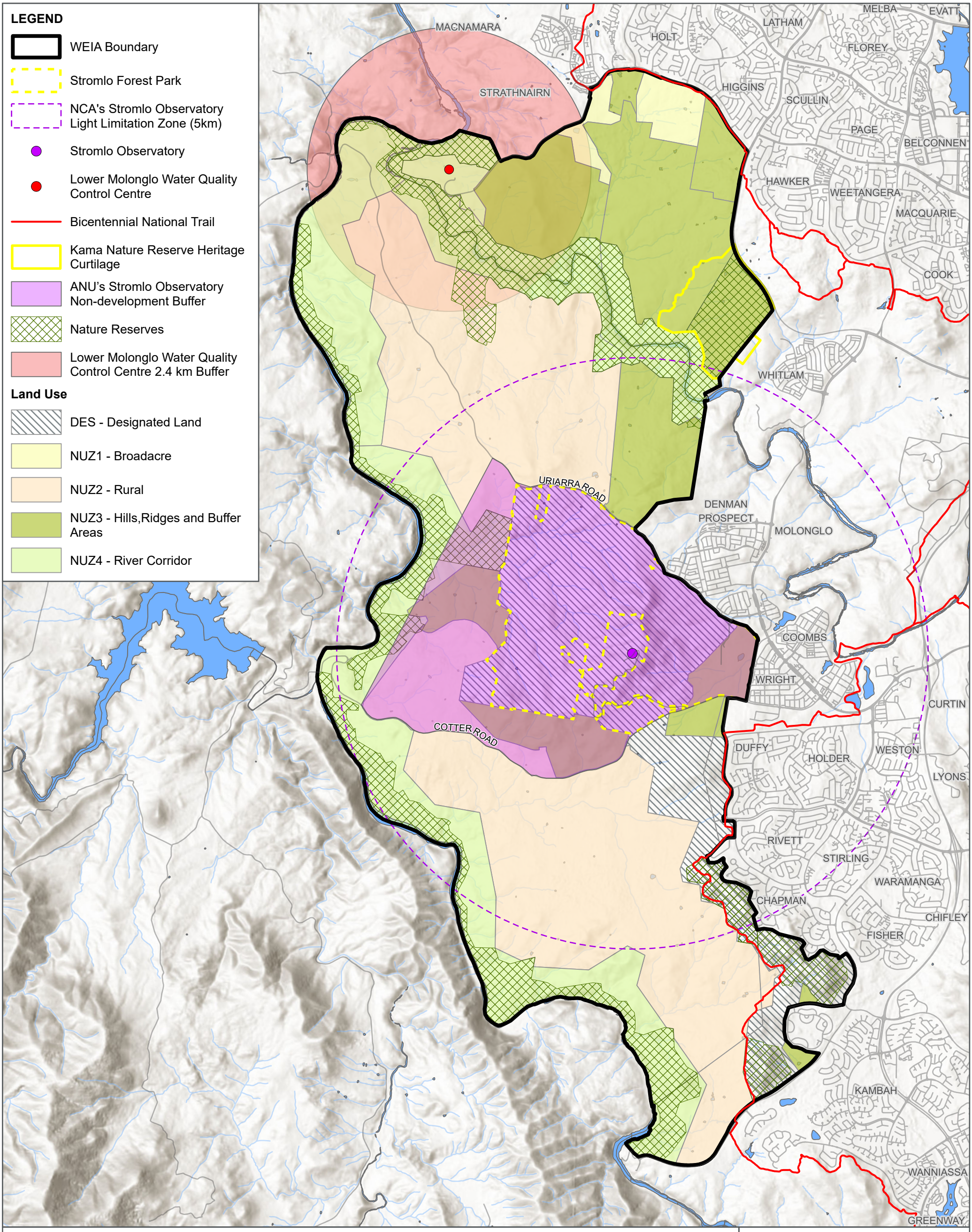


FIG NO. 6-1

FIGURE TITLE Interface With Adjoining Land Use Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

PAGE SIZE A3

SOURCES Base Layers and Territory Plan : www.ACTmapi.act.gov.au © Australian Capital Territory. World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

LEGEND

WEIA Boundary

Rating

Constrained

Highly Constrained

Areas of Restriction

MACGREGOR
FLYNN
MELBA
EVATT
LATHAM
MACNAMARA
HOLT
FLOREY
HIGGINS
STRATHNAIRN
SCULLIN
PAGE
BELCONNEN
HAWKER
WEETANGERA
MACQUARIE
COOK
WHITLAM
URIARRA ROAD
URIARRA VILLAGE
DENMAN PROSPECT
MOLONGLO
COOMBS
WRIGHT
CURTIN
COTTER ROAD
DUFFY
HOLDER
WESTON
LYONS
RIVETT
STIRLING
WARAMANGA
CHAPMAN
CHIFLEY
FISHER
KAMBAH
WANNIASSA
GREENWAY

FIG NO. 6-2

FIGURE TITLE Interface With Adjoining Land Uses Capability Assessment

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

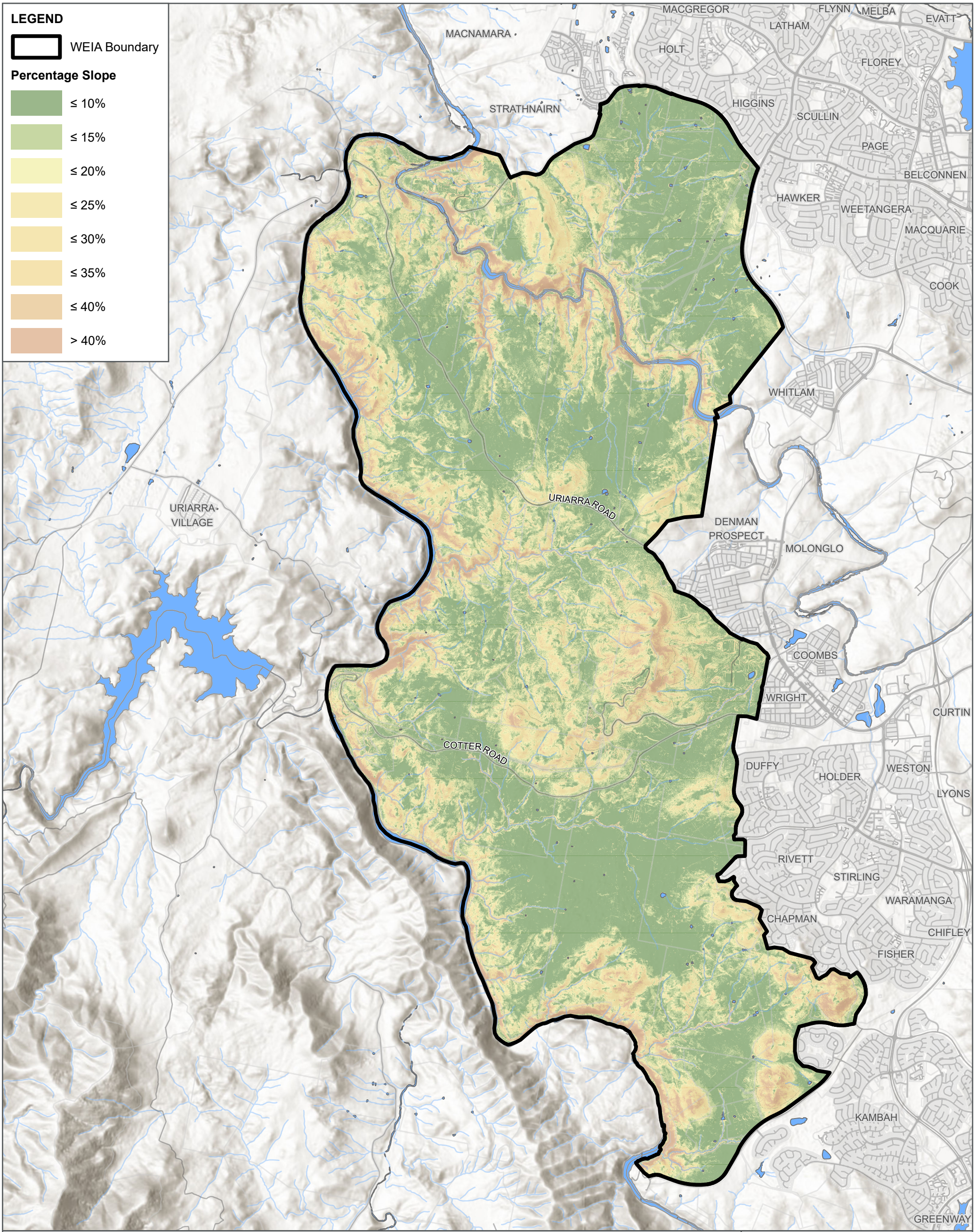


FIG NO. 6-3

FIGURE TITLE Slope Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
Slope created with Elvis © Commonwealth of Australia (Geoscience Australia) 2021
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

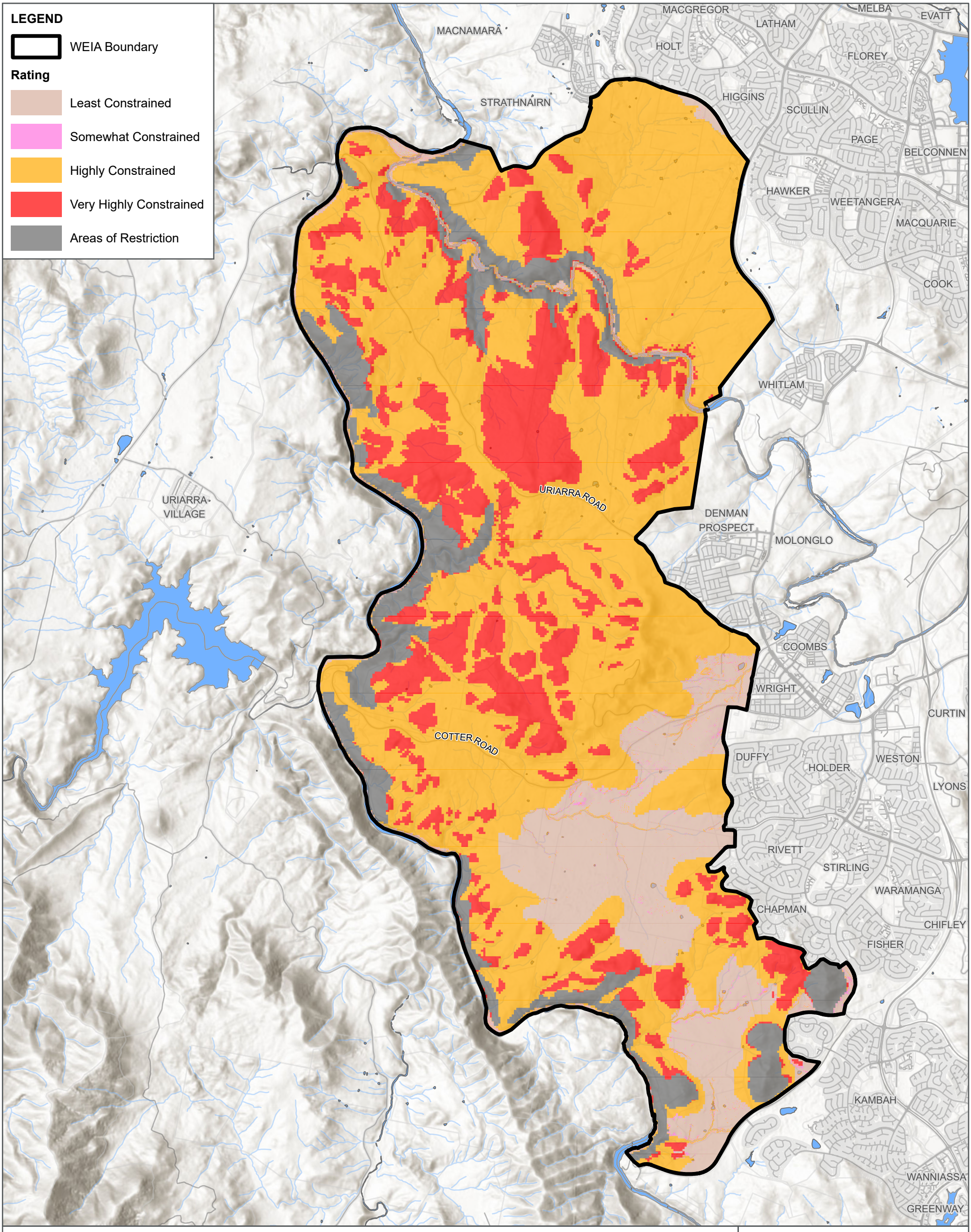


FIG NO. 6-4

FIGURE TITLE Slope and Soils Capability Assessment

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

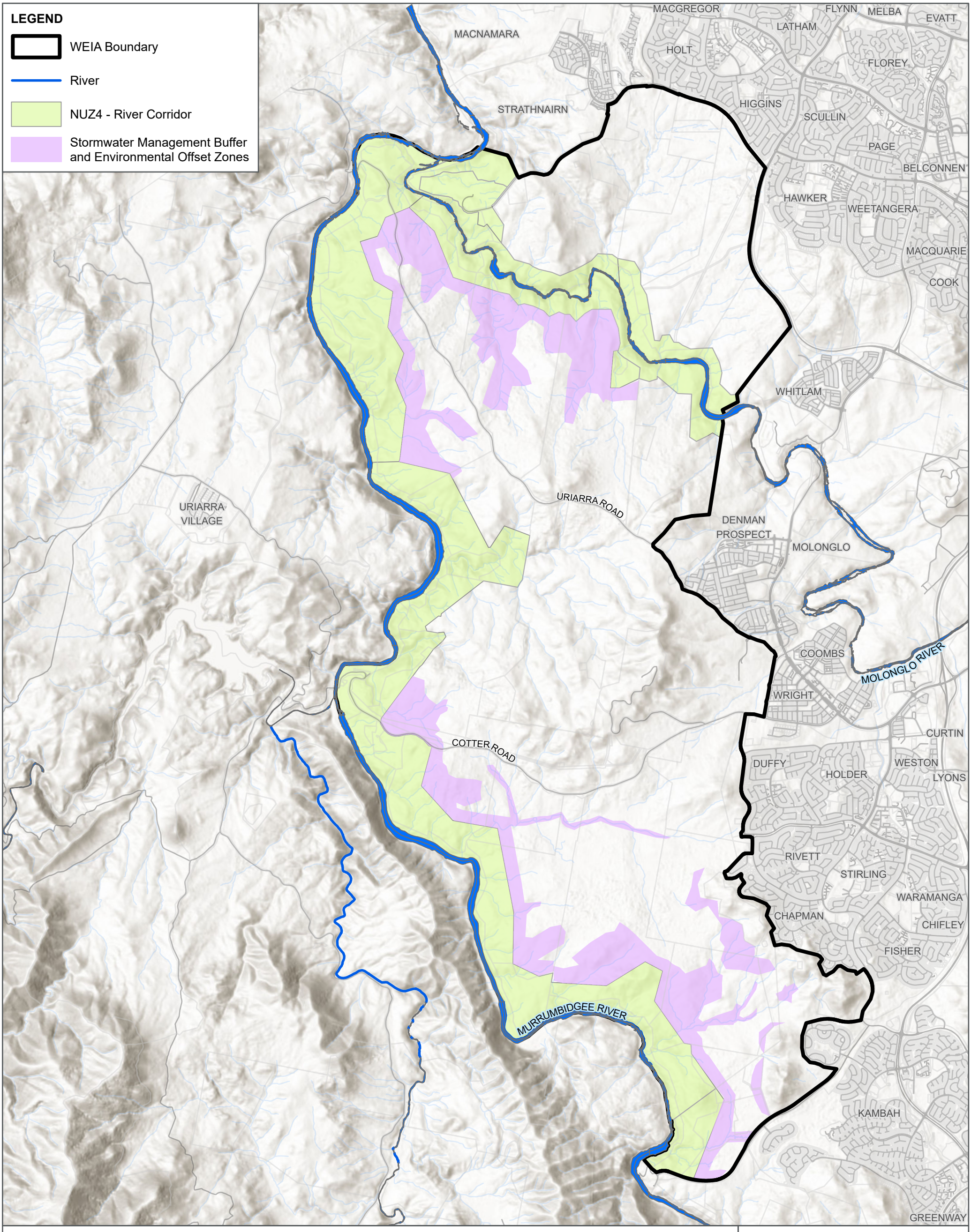


FIG NO. 6-5

FIGURE TITLE Waterways and Waterbodies Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers and Territory Plan: www.ACTmapi.act.gov.au © Australian Capital Territory. World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM GDA2020 MGA Zone 55

SMEC

Member of the Surbana Jurong Group

Location: C:\GIS\NSW\Outgoing\3002862 Western Edge Investigation Area\02_Maps\WEIA Urban Planning\ArcGIS Masterfile\ArcGIS Masterfile.aprx

Last updated by: LL16284 on 25/10/2022 at 12:03

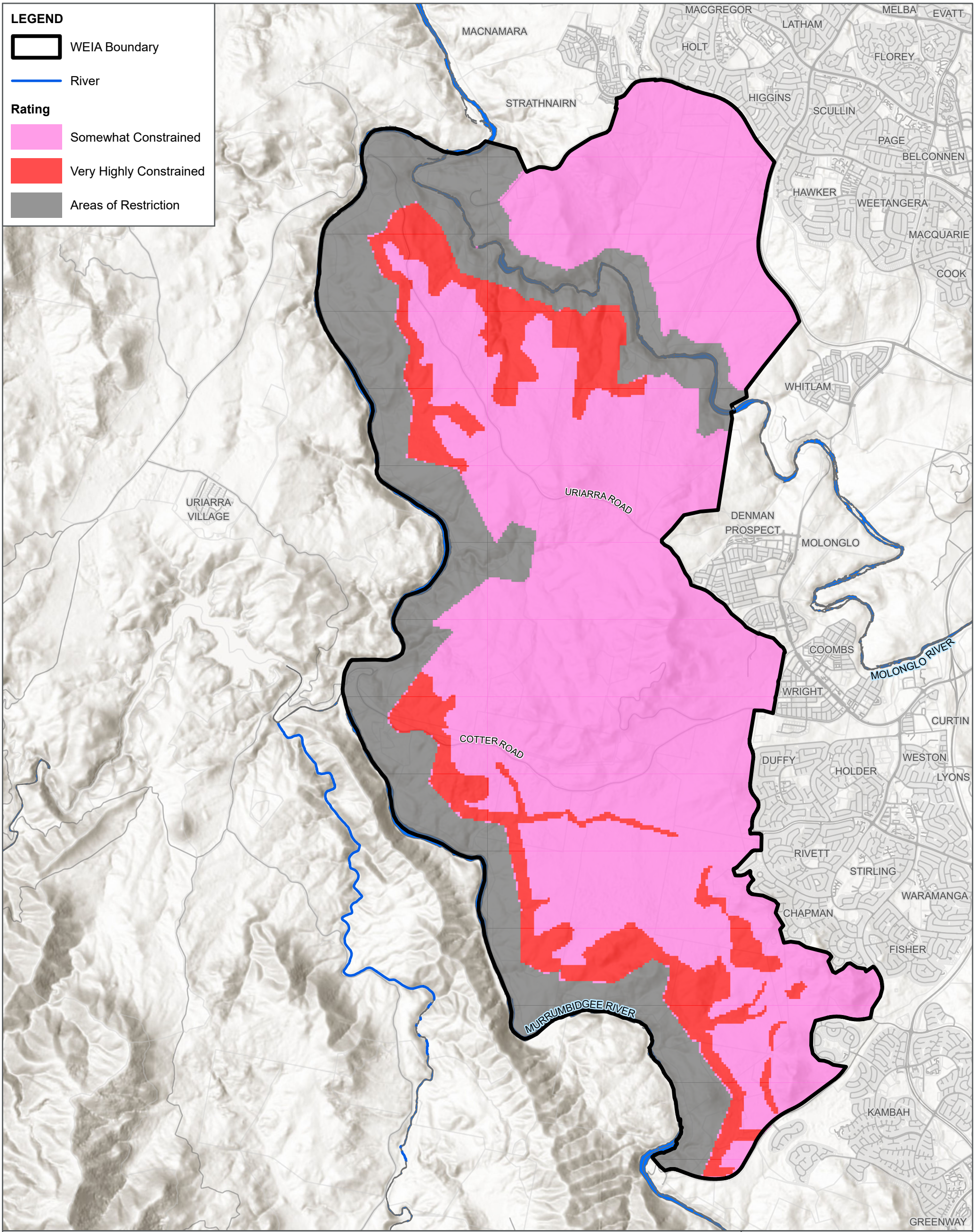


FIG NO. 6-6

FIGURE TITLE Waterways and Waterbodies Capability Assessment

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

6.3.4 Vegetation and habitat

Maintaining biodiversity connectivity for all native flora and fauna communities, not just those classified as vulnerable, threatened and endangered under the NC Act and EPBC Act, was a key driver for considering land use capability and suitability across the WEIA. This is particularly important considering the long-term planning horizon of the project, and the changing listing of species over time. Detailed field assessments for ecological values have not yet been undertaken for the WEIA, hence land use capability assessments cannot accurately reflect ecological constraints, including the need to avoid impacts on EPBC listed species and communities or native species and habitats more broadly, at this stage.

The baseline assessment in Figure 6-7 shows a layered assessment of the previous studies and surveys undertaken by Capital Ecology in 2020. The data also includes the ACT Government connectivity layers, which comprise the 'local links – functional canopy connection' and 'regional links' with a focus on woodland fauna, particularly birds. Connectivity modelling which includes grassland and aquatic-riparian habitats, and a broader suite of woodland species, is currently being developed by EPSDD and has not been considered in this study. The intent of including this data is to provide consideration of key habitat corridors through the site and understand how existing nature reserves are linked. The raw data shows potential regional links of moderate value between McQuoid's Hill Nature Reserve and the Murrumbidgee River. There is also a clustering along Stoney Creek and adjacent to the Kama Nature Reserve.

To avoid skewing the assessment based on current threatened species listings, SMEC developed a heat map for the capability assessment based on the clustering of identified sensitive species. The 'heat mapping' approach was considered appropriate to ensure that the current listing of specific species did not dominate the assessment results; recognising that species currently listed under the EPBC Act or NC Act may change over the course of the potential development horizon being considered for the WEIA. The results of the assessment are shown in Figure 6-8. This assumes that where the mapping confirms multiple habitats or recordings of identified listed species, a range of other biodiversity values are likely to be present.

Maintaining habitat connectivity and biodiversity will require a degree of qualitative consideration, which will be discussed further in the suitability assessment and will need to be supported by additional targeted ecological surveys. There may be options to improve ecological values across the site and additional opportunities to preserve land as nature reserves, to provide a mechanism for offsetting urban development in other areas. By understanding areas of ecologically sensitivity upfront in the capability assessment, there is an opportunity to take a conservation-led approach to development.

It is important to note that the high level nature of this assessment is not intended to provide a detailed analysis of ecological impact or to meet the buffer and offset areas for specific species that may be prescribed in management plans. More detailed studies would be required to determine feasibility of development options and structure planning in the future.

6.3.5 Bushfire Risk

The bushfire capability assessment adopts the bushfire risk categories from the Preliminary Assessment undertaken by Ecological (2020) and discussed in Section 4.1. The risk categories were developed based on slope and vegetation type, and are shown in Figure 6-9. It is important to differentiate that this does not consider bushfire hazard, threat to life or property, or the potential to safely evacuate. These matters will be considered qualitatively in the suitability assessment, alongside climate change and resilience given the potential impact on extended and harsher bushfire seasons. Such matters are often design-driven and would need to be considered during structure planning and preparation of estate development plans in the future.

Based on the assessment criteria adopted, and looking at this criteria in isolation, much of the site is classified as being capable of future development. This is shown in Figure 6-10. Areas that are shown as constrained (yellow) are located within the stormwater management buffers, so are undevelopable for other reasons. The interactions between the criteria and the layers will be demonstrated in the consolidated assessment, using the relative weightings adopted.

Given the increased frequency and severity of bushfires that is expected due to climate change, it was important to consider planning and development controls, building typologies, appropriate asset protection zones and hazard management, as well as environmental values, connectivity corridors and environmental offset and avoidance areas in the suitability assessment and scenario testing. Ensuring developable parcels are provided with good connectivity to the existing road network to meet the requirements of ACT Emergency Services in terms of evacuation and access will also be a critical consideration.

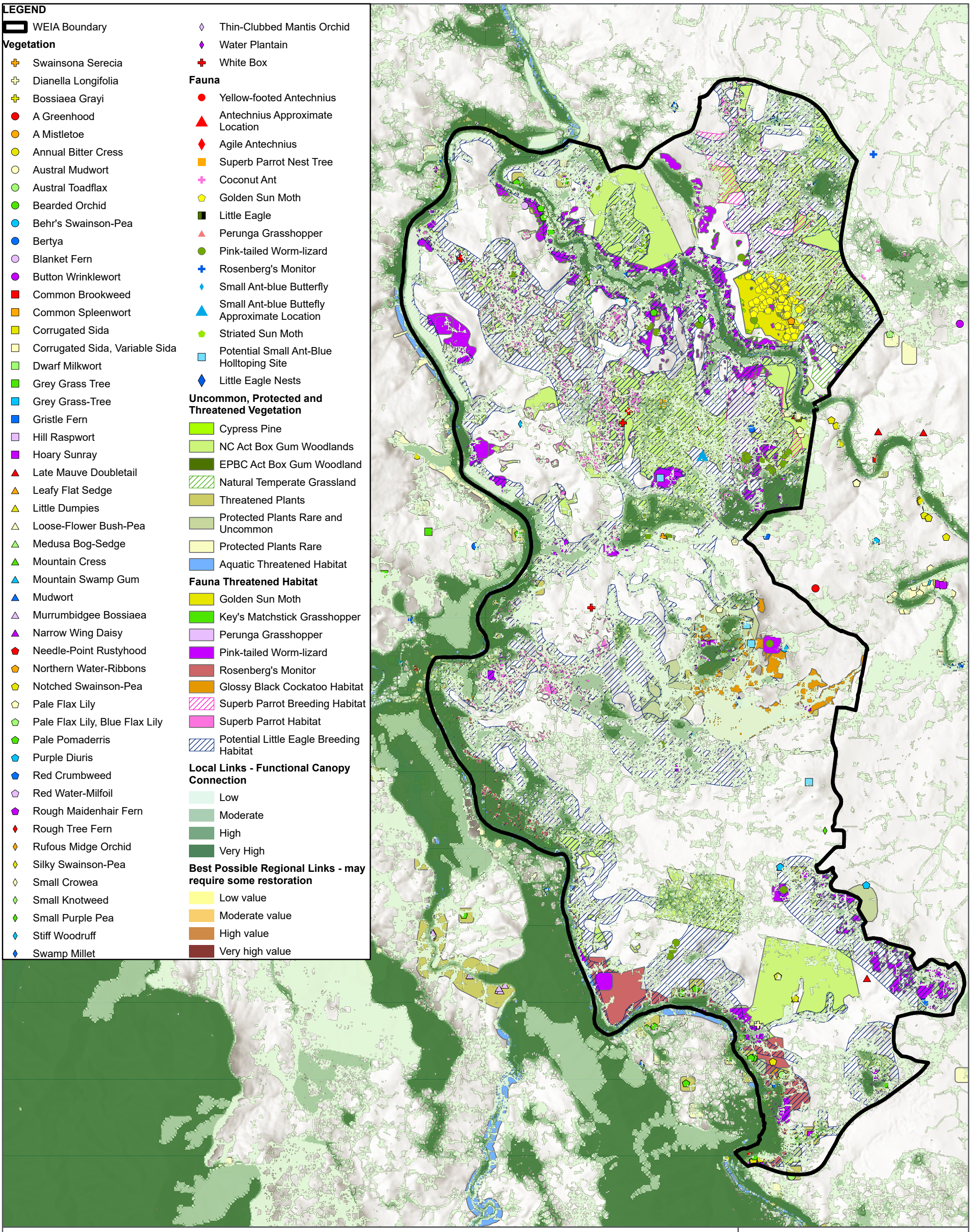


FIG NO. 6-7

FIGURE TITLE Vegetation and Habitat Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers and Fauna and Flora Data: www.ACTmapi.act.gov.au
© Australian Capital Territory and Capital Ecology 2020
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

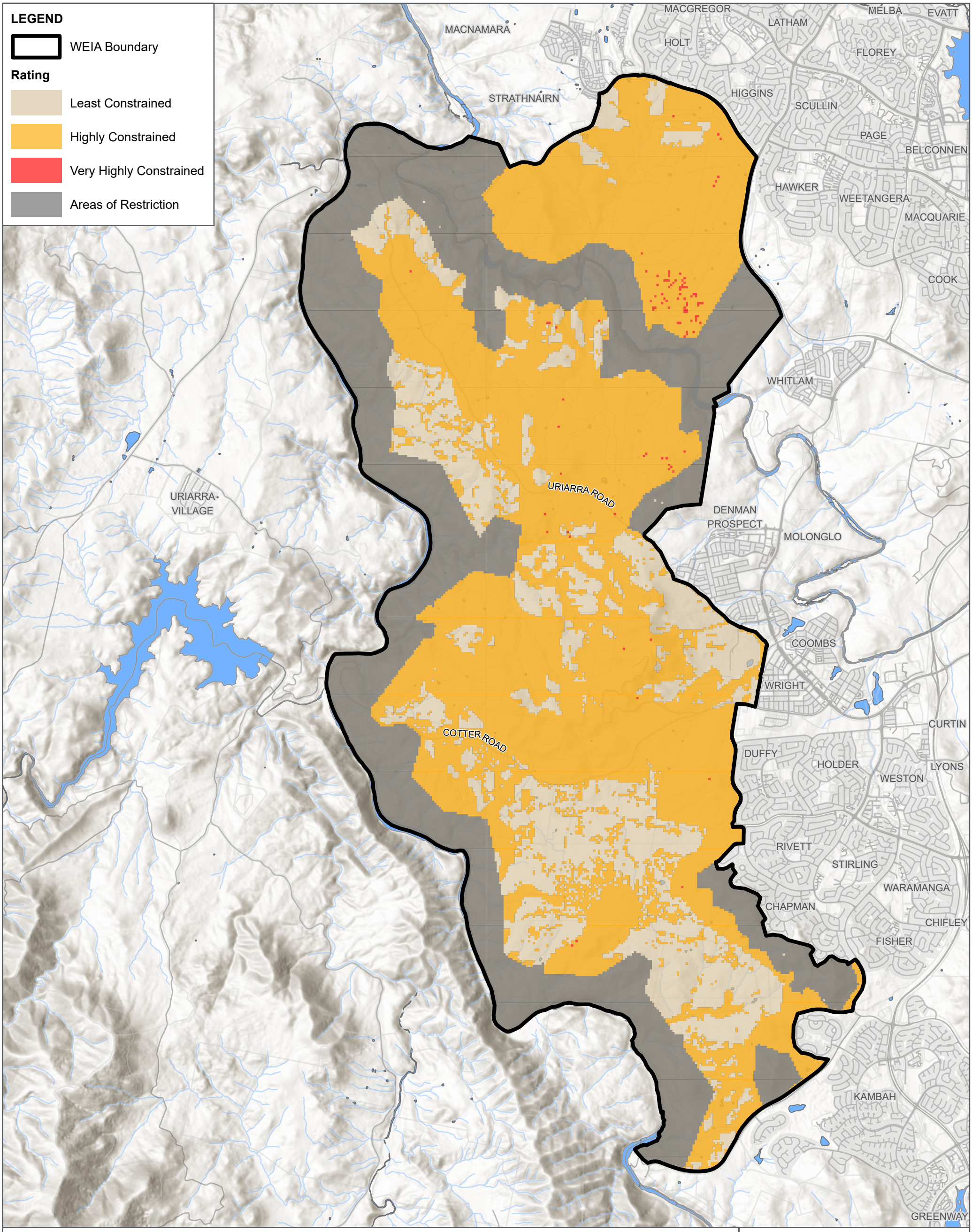


FIG NO. 6-8

FIGURE TITLE Vegetation and Habitat Capability Assessment

PROJECT TITLE Western Edge Investigation Area - Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

LEGEND

- WEIA Boundary
- ACT Urban Development

Bushfire Risk Categories

- High
- Moderate
- Low

NSW Vegetation Category

- Vegetation Buffer
- Vegetation Category 1
- Vegetation Category 3

MACGREGOR
FLYNN
MELBA
EVATT
LATHAM
MACNAMARA
HOLT
FLOREY
HIGGINS
STRATHNAIRN
SCULLIN
PAGE
BELCONNEN
HAWKER
WEETANGERA
MACQUARIE
COOK
WHITLAM
URIARRA ROAD
URIARRA VILLAGE
DENMAN PROSPECT
MOLONGLO
COOMBS
WRIGHT
CURTIN
COTTER ROAD
DUFFY
HOLDER
WESTON
LYONS
RIVETT
STIRLING
WARAMANGA
CHAPMAN
CHIFLEY
FISHER
KAMBAH
GREENWAY

FIG NO. 6-9

FIGURE TITLE Bushfire Hazard Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3
Km
1:60,000

PAGE SIZE A3

SOURCES Western Edge Investigation Area Preliminary Bushfire Risk Assessment, Eco Logical Australia 2020
Base Layers and Territory Plan: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

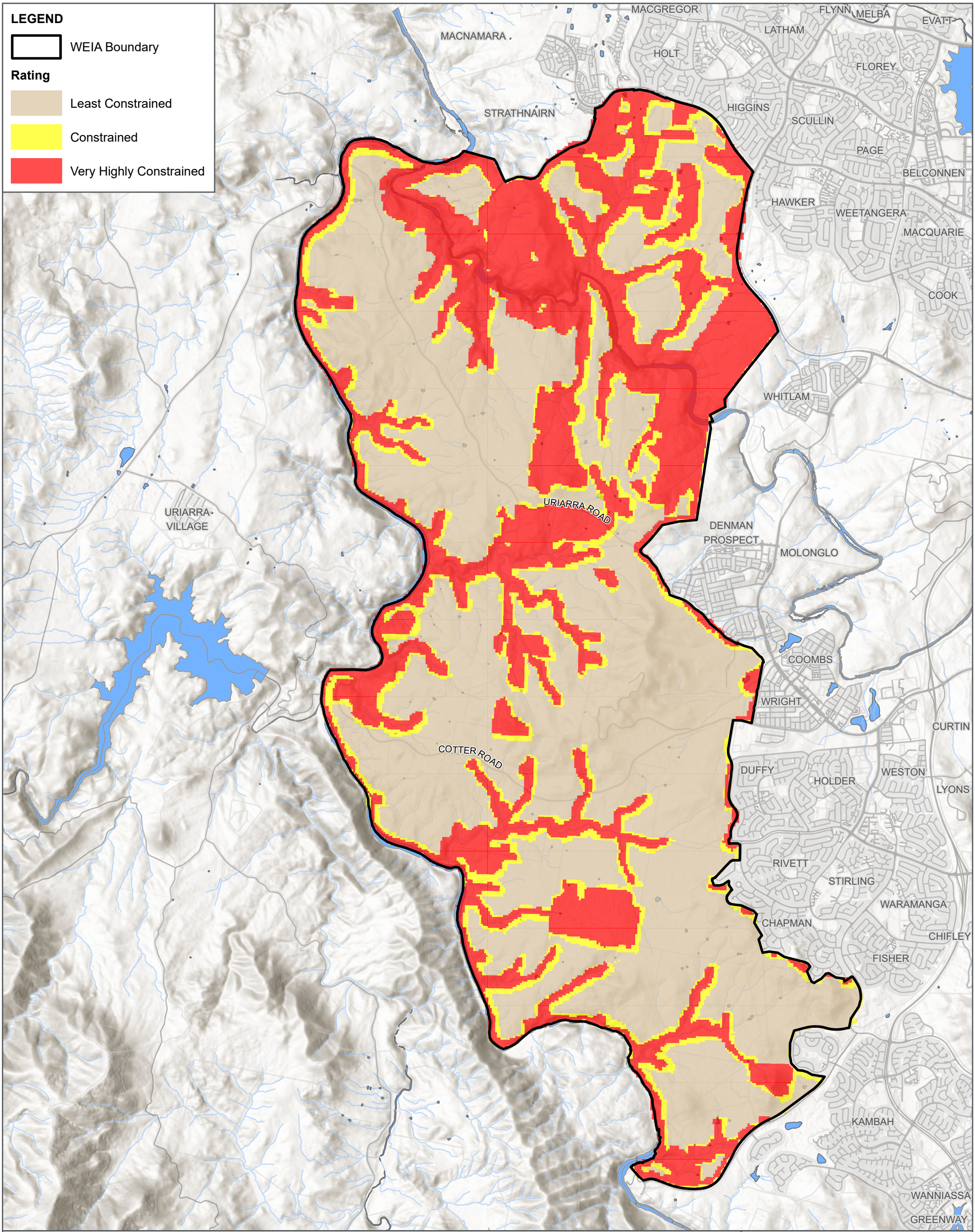


FIG NO. 6-10

FIGURE TITLE Bushfire Hazard Capability Assessment

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

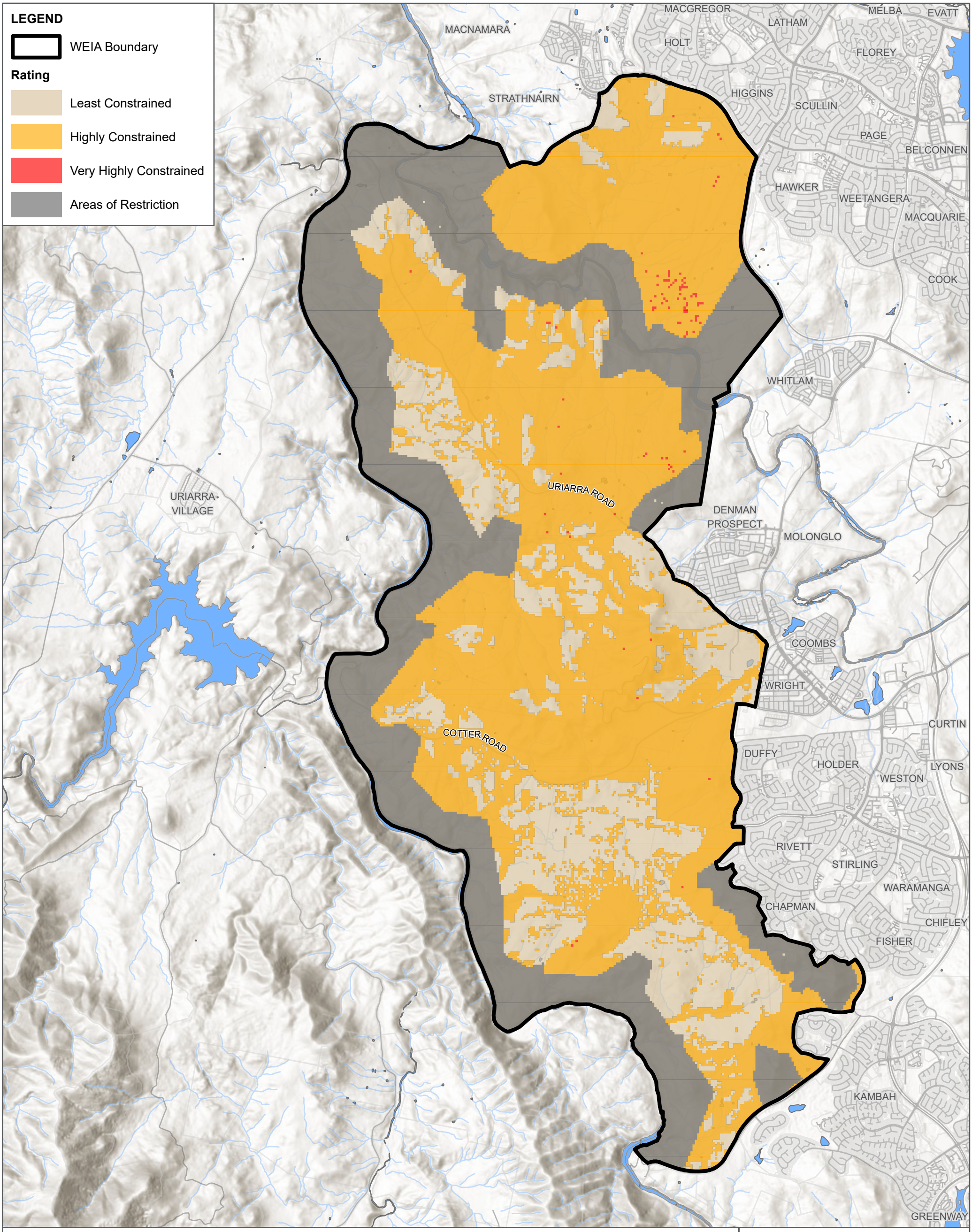


FIG NO. 6-8

FIGURE TITLE Vegetation and Habitat Capability Assessment

PROJECT TITLE Western Edge Investigation Area - Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

6.3.6 Road access and infrastructure

The road access and infrastructure criteria is based on existing infrastructure assets for large trunk infrastructure. Key infrastructure includes the 330KV transmission line which is part of the National Grid managed by Transgrid and runs north-south through the WEIA, the MVIS which services the southern portion of Canberra and discharges to the LMWQCC and the bulk water supply infrastructure linking Canberra's potable water supply to the Cotter Dam and Mount Stromlo water treatment facility.

The baseline analysis in Figure 6-11 shows four roughly east-west alignments and a north-south electricity corridor. There are existing gas connections into the LMWQCC and the Mount Stromlo Observatory which will need to be protected in the northern part of the site.

The capability assessment in Figure 6-12 indicates that much of the site is very highly constrained, owing primarily to the lack of existing services within close proximity. Land along the eastern side of the WEIA, at the interface with existing suburban areas, is shown as 'highly constrained' where existing service reticulation could potentially be augmented and extended. Areas of restriction that are excluded (grey) areas are owing to the presence of significant infrastructure that would be costly to relocate, including water treatment facilities ad bulk mains.

Siting of appropriate land uses and buffers to existing infrastructure are considered in the suitability assessment, where urban capable land is grouped together, and a qualitative assessment can take place regarding proximity to key utility assets and analysis of ease of connectivity to the existing road network. The work in this space is restricted as further feasibility assessments would be needed in the future to confirm capacity of existing infrastructure to accommodate increased demand from development in the WEIA.

6.3.7 Visual impact

By adopting the 'Scenic Priority Scores' from the visual impact assessment undertaken by VPA, SMEC prepared a capability assessment for the visual impact criteria. In isolation, this criteria shows that the most urban capable areas are present in the low lying land along the river corridor (Figure 6-13). This demonstrates the importance of the cumulative assessment of all criteria, as many of the areas that are preferred from a visual impact perspective, may have other physical, environmental and geotechnical constraints.

The capability assessment for this criteria in Figure 6-14 shows areas within Central Molonglo appear as the highest constrained, and generally occur within NUZ3 Hills Ridges and Buffers zoning or on Designated Land, in addition to an area of restriction identified as excluded land, which is highly visible and is located on the eastern side of the Mount Stromlo Observatory.

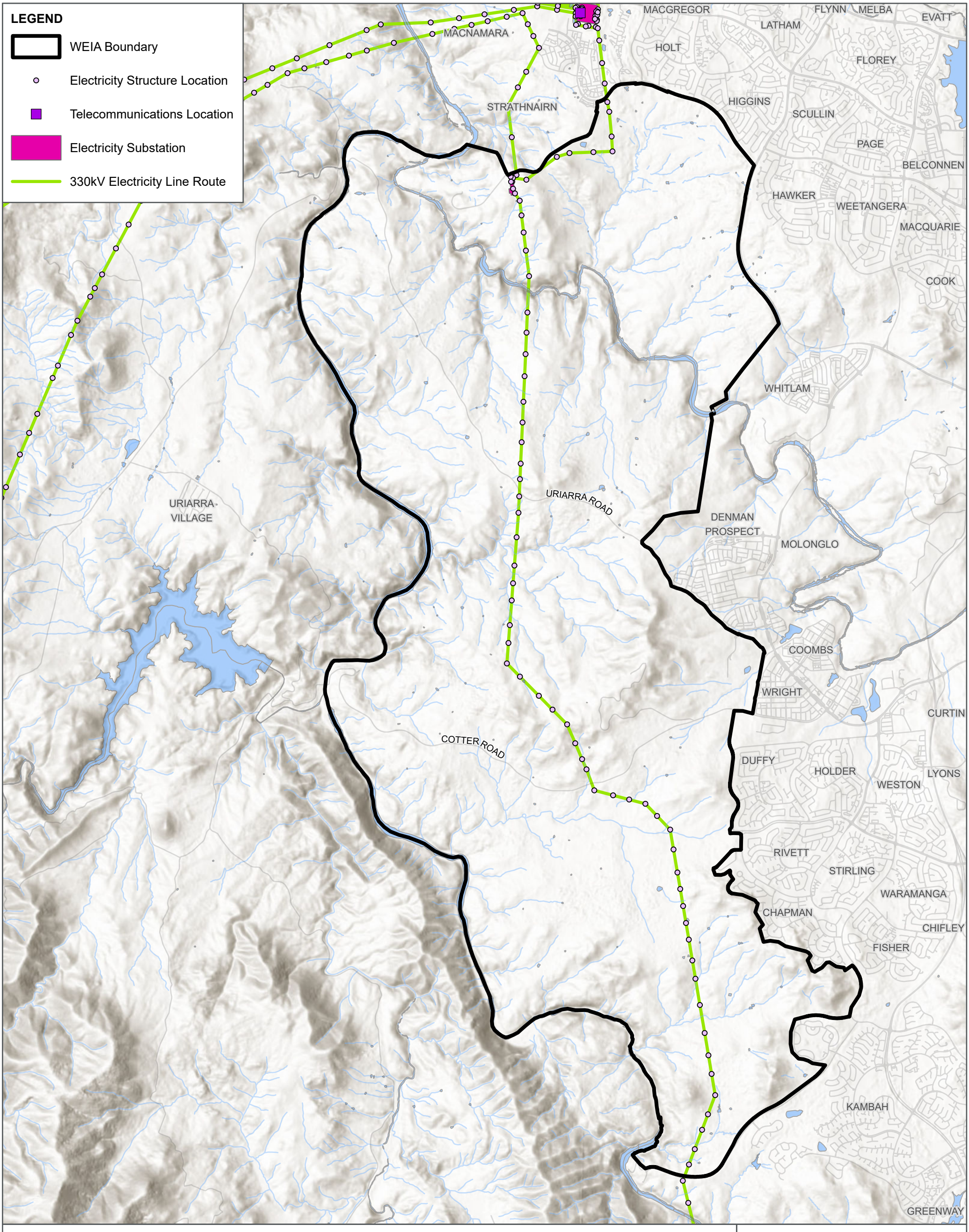


FIG NO. 6-11

FIGURE TITLE Transgrid Infrastructure Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Transgrid, Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory. World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM GDA2020 MGA Zone 55

SMEC

Member of the Surbana Jurong Group

LEGEND

WEIA Boundary

Rating

No Value

Highly Constrained

Very Highly Constrained

Areas of Restriction

MACGREGOR
FLYNN
MELBA
EVATT
LATHAM
MACNAMARA
HOLT
FLOREY
STRATHNAIRN
HIGGINS
SCULLIN
PAGE
BELCONNEN
HAWKER
WEETANGERA
MACQUARIE
COOK
WHITLAM
URIARRA ROAD
URIARRA VILLAGE
DENMAN PROSPECT
MOLONGLO
COOMBS
WRIGHT
CURTIN
COTTER ROAD
DUFFY
HOLDER
WESTON
LYONS
RIVETT
STIRLING
WARAMANGA
CHAPMAN
CHIFLEY
FISHER
KAMBAH
GREENWAY
WANNIASSA

FIG NO. 6-12

FIGURE TITLE Road Access and Infrastructure Capability Assessment

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:59,225

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

LEGEND

WEIA Boundary

Scenic quality values plus scenic priority scores

- 3 - 9
- 9 - 13
- 13 - 17
- 17 - 20.5
- 20.5 - 24.5
- 24.5- 29
- 29 - 34
- 34 - 39.5
- 39.5 - 48.5

MACNAMARA
MACGREGOR
LATHAM
MELBA
EVATT
HOLT
FLOREY
HIGGINS
STRATHNAIRN
SCULLIN
PAGE
BELCONNEN
HAWKER
WEETANGERA
MACQUARIE
COOK
WHITLAM
URIARRA ROAD
URIARRA VILLAGE
DENMAN PROSPECT
MOLONGLO
COOMBS
WRIGHT
CURTIN
COTTER ROAD
DUFFY
HOLDER
WESTON
LYONS
RIVETT
STIRLING
WARAMANGA
CHAPMAN
CHIFLEY
FISHER
KAMBAH
WANNIASSA
GREENWAY

FIG NO. 6-13

FIGURE TITLE Visual Impact Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Landscape Character Values and Visual Assessment, VPA 2020
Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

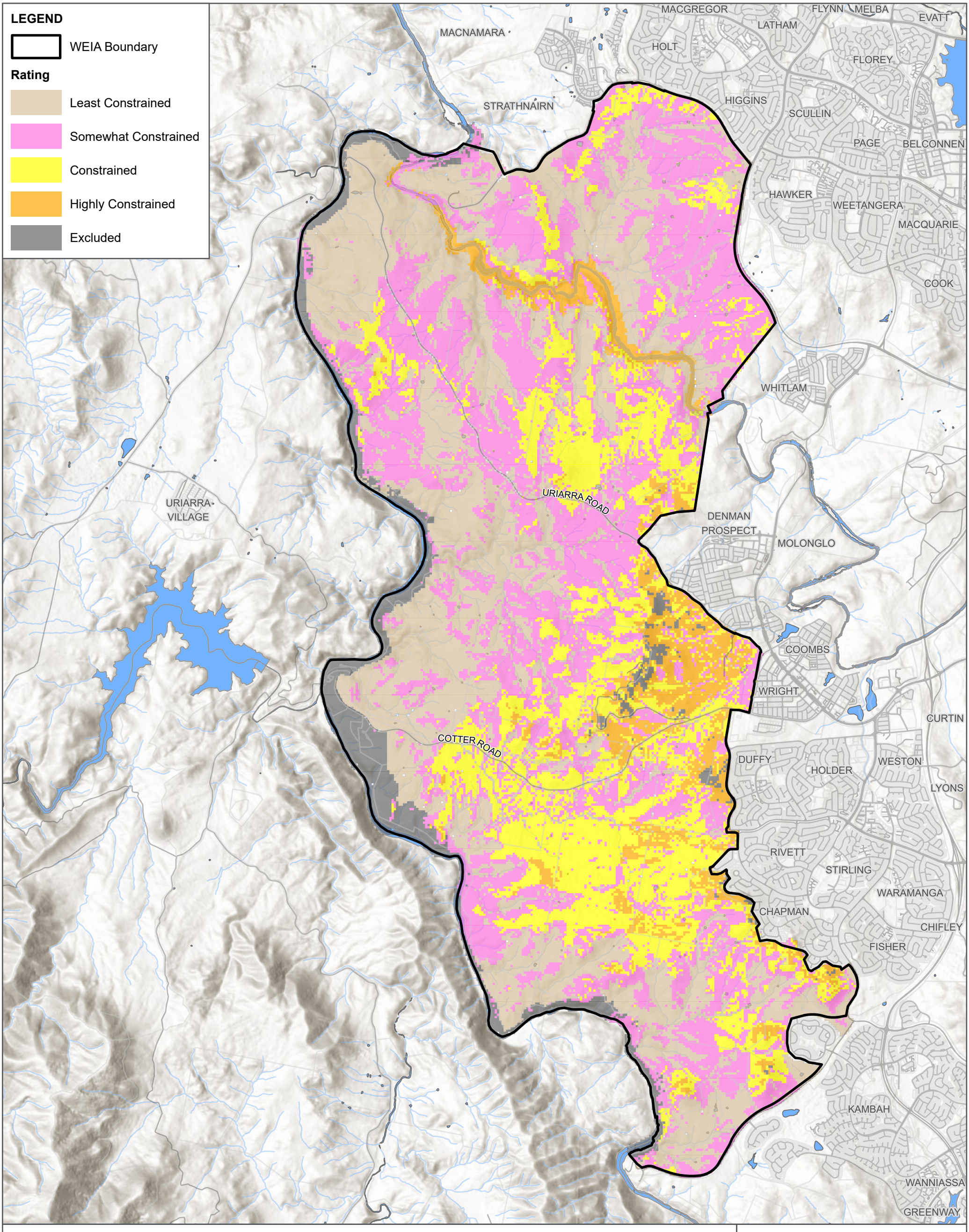


FIG NO. 6-14

FIGURE TITLE Visual Impact Capability Assessment

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

6.4 Consolidated Capability Assessment

The consolidated capability assessment brings together all the thematic results and applies the relative weighting which was adopted in Section 6.2. The outcome of the consolidated assessment is provided in Figure 6-15. Noting the competing physical and ecological constraints within the WEIA, it is not surprising that much of the land is classified as being constrained.

Urban Investigation Areas have been drawn around areas with a rating of constrained or highly constrained, to provide key groupings for further investigation in the suitability assessment. These areas for further investigation have been classified as follows:

- **Central Molonglo Cluster (approx. 1,240 ha)**
- **Uriarra Ridge Cluster (approx. 1,798 ha)**
- **West Molonglo Cluster (approx. 1,785 ha)**
- **Bulgar Creek Cluster (approx. 1,500 ha)**
- **Kambah Cluster (approx. 668 ha)**

The suitability assessment in the next chapter provides a more in depth analysis of the opportunities and constraints of each cluster.

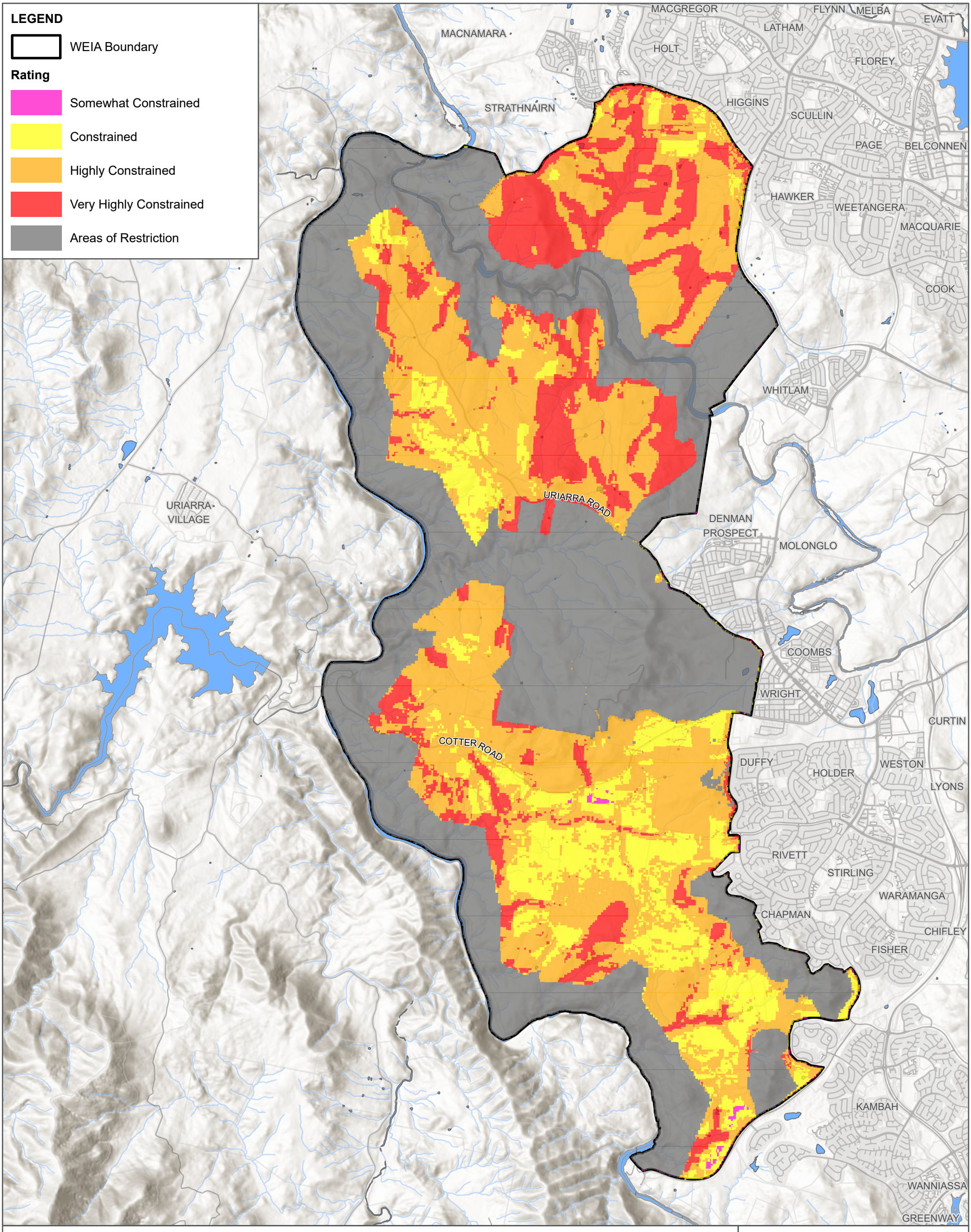


FIG NO. 6-15

FIGURE TITLE Consolidated Capability Assessment

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

Location: C:\GIS\NSW\Outgoing\3002862 Western Edge Investigation Area\02_Maps\WEIA Urban Planning\ArcGIS Masterfile\ArcGIS Masterfile.aprx

Last updated by: LL16284 on 20/01/2023 at 10:33

7. Land Suitability Assessment

The Land Suitability Assessment provides a comparative assessment of each of the investigation areas developed in the capability assessment.

This assessment considers:

- Size of land parcel
- Availability of infrastructure
- Road connectivity
- Slope and topography
- Waterways
- Ecology and biodiversity connectivity
- Nearby facilitating projects
- Existing constraints such as zoning and bushfire
- Outcome of capability assessment

The assessment provides an analysis of characteristics, constraints and opportunities of each of the investigation areas for consideration when developing the potential development scenarios. An assessment of each investigation area is provided below, alongside a discussion of future land uses that may be suitable and subject to confirmation through future assessments.

7.1 Central Molonglo Investigation Area

This investigation area is a grouping of land (approx. 1,240 ha) extending south of Drake-Brockman Drive and west of William Hovell Drive and the Kama Nature Reserve. The area includes 132KV HV lines and the MVIS which follows the northern banks of the Molonglo River. As this potential site interfaces with existing established suburbs in West Belconnen, the land may be more readily serviceable by road and utility networks. Expansion of public transport networks, existing established (or planned) education, health and emergency services, as well as local/regional centres could also potentially service this land. The area also contains a range of environmental values.

An analysis of key characteristics is provided in Table 7–1, with a summary of opportunities and challenges in Table 7–2, followed by future land use visioning.

Table 7–1 | Analysis of characteristics of the Central Molonglo Investigation Area

Central Molonglo Investigation Area	
Bushfire	Large parts of this investigation area around the periphery are classified as high bushfire risk, leaving only some parts in the centre as low risk. As the land within this area is mainly broadacre or hills, ridges and buffers, increased urbanisation would likely result in changes to the bushfire hazard. There is the potential for multiple emergency egress points from the site to nearby collector road of Drake-Brockman Drive and arterial road of William Hovell Drive. Access points to nearby roads would require further consideration as part of a feasibility study considering potential structure planning, land use and traffic generation.
Planning and Zoning	Predominantly zoned as *NUZ3- Hills. Ridges and buffer areas;* with a small area in the north as *NUZ1-Broadacre*. Nearby land uses include future urban areas to the west and existing low density residential suburbs in Holt and Higgins to the north. Nature reserves are located south-east (Kama Nature Reserve) and south (Molonglo River Corridor). The Bicentennial National Trail runs along the northern and eastern boundaries of the investigation area. The area contains Lands End, the former location of the Weetangera Methodist Church and the heritage listed Old Weetangera Cemetery which contains 44 burials. It is noted that Lands End is not a registered heritage place, however, this does not preclude Lands End from being conserved a place of historic interest in response to community views. The Old Weetangera Cemetery was listed on the ACT Heritage Register in 2003 and is significant for its age, location, composition, burials and intact nature. The adjoining Kama Nature Reserve, which was established in 2008, was listed on the ACT Heritage Register in 2012 for its natural heritage values. The heritage curtilage for Kama extends to the Box Gum Woodland species in the road reserve along William Hovell Drive, as they are similar to the vegetation patterns that existed prior to European settlement. The heritage curtilage also extends to the north-west beyond the nature reserve boundary, noting that the heritage curtilage is larger than the nature reserve boundary. The Kama Nature Reserve is not identified as an Investigation Area for

Central Molonglo Investigation Area	
	Potential Development and early ecological investigations of this area are recommended to identify capability to accommodate appropriate uses like walking trails. Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in the restricted Attachment A. There are multiple registered Aboriginal places across the area, and it is noted that there may be additional Aboriginal places which are not yet on the Register. Given the lack of spatial data available on these places, future development planning will need to consider information gaps, along with additional heritage assessment in accordance with the operating statutory framework at the time. In 2008, the area was more definitively removed 'in perpetuity' from being considered for future urban development following the Standing Committee on Planning and Environment report on DV 281 in August 2008. The committee's fourth recommendation is that Central Molonglo be removed in perpetuity from being considered as a future urban area. Initially, the ACT Government stated that land would not be required for 20 years. In 2008, an ACT Government commitment removed in perpetuity a significant portion of this area from being considered as a future urban area, and therefore may only be considered for non-urban land uses if this decision is reconsidered. Archaeological site patterning in the region shows a landscape dominated by low density artefact scatters focused on the areas of the Molonglo River to the south and Black Mountain to the east, it is noted that the location of low density artefacts is based on previous heritage studies and assessment in the area and that this may change with future investigations. Heritage studies have been undertaken in the surrounding areas for the future residential developments within the Molonglo Valley which have located numerous small artefact sites within the vicinity of the Central Molonglo Investigation Area. Further investigation would be required to determine the presence of Indigenous heritage sites within the site, and to ensure master planning is responsive to any Aboriginal places of significance or high conservation value.
Road Access	Drake -Brockman Drive and William Hovell Drive are located on the northern and eastern boundary of the site respectively. Pro Hart Avenue joins the western extent of Drake-Brockman Drive, whilst Stockdill Drive runs along the western boundary. A network of existing driveways and private roads provide access to the vineyards and rural land uses currently present within the site. Subject to appropriate consideration by TCCS, connection into these roads could facilitate future urban development.
Evo Energy	Overhead high voltage transmission electricity lines pass centrally through the site (132KV) and the south west of the site (330KV National Grid). The site also has an underground Fibre communications cable within the easement of the 132KV line.
Transgrid	A number of electricity structures are earmarked on the electricity line route running in the north west of the investigation area, including a substation adjacent to Stockdill Drive.
Gas Infrastructure	A gas pipe runs along the northern boundary of the site with gas fittings and gas meters. A gas station is also present on Pro Hart Avenue, near Fullston Way.
Icon Water Infrastructure	A bulk water main runs north-south in the eastern portion of the site to a reservoir that is located near the corner of Drake-Brockman Drive and William Hovell Drive. Reticulation of potable water from this reservoir runs along Drake-Brockman Drive to networks within adjoining suburbs and to the LMWQCC.
Sewer Infrastructure	The MVIS runs along the southern boundary of the site, within the northern extent of the Molonglo River Reserve.
Slope	The terrain is mainly flat with a slope gradient of less than 10%, with the exception of the south western portion of the site which has a slope of 20% to 35%. Suitable uses for this portion of the site would need further investigation. Flatter portions of the site are generally suited to urban development however the steeper extents along Stockdill Drive would have significant challenges.
Soils	The soil type is predominantly *Burra,* with a very small section in the north of the site as *Williamsdale.* There are areas of rocky outcrop within the steeper terrain and adjacent to river courses which would present a constraint for future urban development however due to their location, are unlikely to present as areas of urbanisation.
Visual Impact	The portions of the site toward Drake-Brockman Drive and William Hovell Drive are reasonably elevated with moderate scenic priority scores in the Landscape and Visual Impact Assessment (LVIA).

Central Molonglo Investigation Area	
	Development would need to appropriately consider visual impact on views towards the site from existing urban areas, particularly noting that much of the land is currently zoned *NUZ3 - Hills, Ridges and Buffers* under the Territory Plan.
Vegetation and Habitat	The eastern portion of the site, particularly areas of Box Gum Woodland, have the potential to provide connectivity between the Molonglo River Reserve, Kama Nature Reserve and the Pinnacle Nature Reserve, located to the north of the study area, particularly for bird species. The connectivity mapping shows potential regional links east-west corridors, and areas of high value canopy connections in the steeper option of the site near Stockdill Drive, and eastern portion of the site near the Old Weetangera Cemetery. The existing ecology surveys confirm the potential for Little Eagle Breeding Habitat across most of the area, as well as areas of Superb Parrot Breeding Habitat and potential habitat for the EPBC listed Golden Sun Moth in the south adjacent to the Molonglo River Reserve. Through the course of engagement with the PCG on this project, it has become apparent that a buffer may need to be placed around the known Superb Parrot breeding site in line with the ACT approved Superb Parrot Action Plan. The ACT and Commonwealth commitments to protecting Superb Parrot habitat are acknowledged, given that the nesting colony in this area is one of only two mapped colonies known for the species nationally. As such, it will be necessary to consider these more detailed and targeted matters in the next phase of the project when looking at land use feasibility, regional offsetting and establishing boundaries for Future Urban Areas.
Waterways	There are a number of unnamed waterways through the site and several farm dams. Many of the creek lines and higher order tributaries appear to be in poor condition and show signs of erosion. There is the opportunity to restore these creek lines and utilise them as blue-green corridors for stormwater management, urban amenity and as habitat corridors. The waterways all drain to the Molonglo River located along the south western boundary of the site.

Nearby current and planned projects include:

- Suburban Land Agency undergrounding of electrical infrastructure
- William Hovell Drive duplication
- Drake-Brockman Drive Duplication
- Planned expansion of Ginninderry future urban areas
- LMWQCC projects relating to biosolids management and wastewater processing
- TCCS investigation into suitable sites for a waste transfer facility
- Battery Storage on Blocks 1634 and 1635 Belconnen ('Big Battery')

Table 7–2 | Strengths and Weaknesses of the Central Molonglo Investigation Area

Opportunities	Challenges
Most of the investigation area has a slope of less than 10%	Steep portion of the site on Stockdill Drive presents challenges for urban development
Slope of the site toward the MVIS and LMWQCC provides options for wastewater servicing	Presence of European Heritage sites within the site may require a large curtilage
Presence of water reticulation along the northern boundary and reservoir in the north-east provide reasonably straightforward connection to potable water	Retaining habitat connectivity through the site
Presence of electrical lines and substations provides reasonably straightforward connection to power	Retention of Bicentennial National Trail
Access to nearby road network presents multiple options for access to/from the site	Surrounding arterial roads will also need to accommodate increased traffic from the growing Ginninderry (West Belconnen)
Appropriate management of bushfire hazard could present a fire break to existing residential development in Belconnen	The Planning Strategy does not permit urban development in this area
Restoration of creek lines, and use as 'green fingers' or blue-green corridors	Limited heritage assessment of this area has been undertaken

Opportunities	Challenges
	Presence of Superb Parrot habitat and breeding sites

Based upon the outcomes of the Visioning Workshop held on 28 July 2022 and the above assessment of the investigation area, it is suggested that the following land uses may warrant further investigation in the scenario development:

- Potential for bulky goods retail, light industry or service industries, particularly where there may be opportunity to relocate bulky good uses from land within the nearby Belconnen Town Centre that may be better suited to urban renewal for multi-unit or mixed use development
- Other land uses to support surrounding residential areas
- Waste transfer station
- Potential greenfield urban development

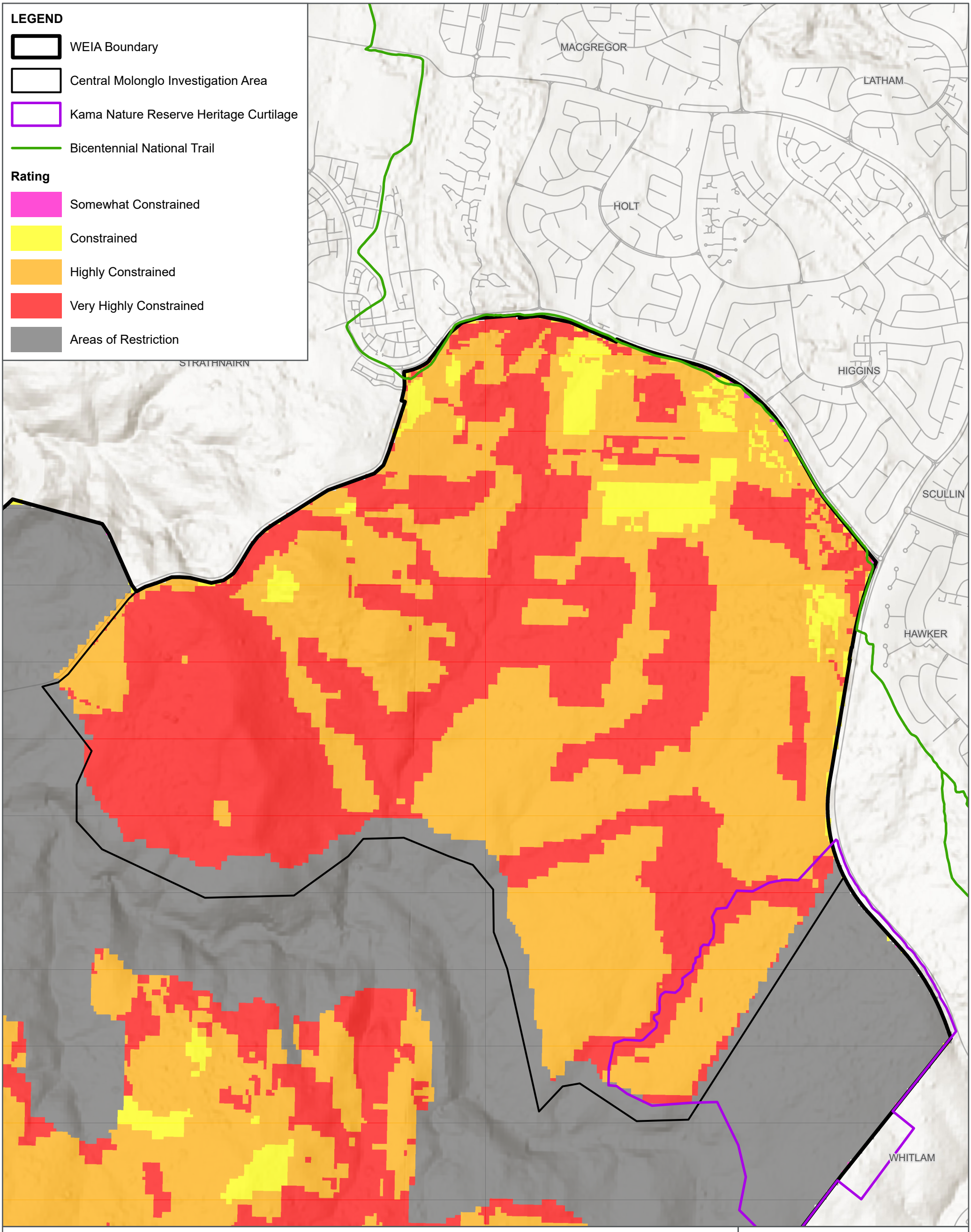


FIG NO. 7-1

FIGURE TITLE Central Molonglo Investigation Area

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1

Km

1:20,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

Location: C:\GIS\NSW\Outgoing\3002862 Western Edge Investigation Area\02_Maps\WEIA Urban Planning\ArcGIS Masterfile\ArcGIS Masterfile.aprx

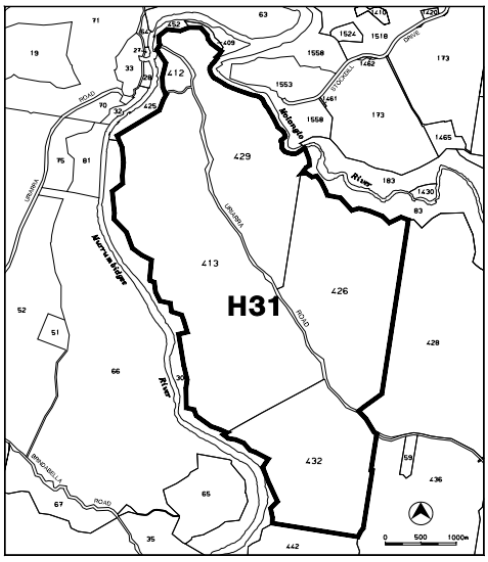
Last updated by: LL16284 on 16/12/2022 at 12:50

7.2 Uriarra Ridge Investigation Area

The Uriarra Ridge Investigation Area presents a grouping of land (approx. 1,798 ha) north and south of Uriarra Road mostly comprising farmland and rolling hills. This Investigation Area is more isolated, and consideration of proximity to employment, education, community, emergency services and health infrastructure would be a key matter for consideration, as well as connectivity to the transport network.

An analysis of key characteristics is provided in Table 7–3, with a summary of opportunities and challenges in Table 7–4, followed by future land use visioning.

Table 7–3 | Analysis of characteristics of the Uriarra Ridge Investigation Area

Uriarra Ridge Investigation Area	
Bushfire	Mostly low bushfire hazard, with higher hazards along the Murrumbidgee and Molonglo River Corridors.
Planning and Zoning	The site is mostly zoned NUZ2 – Rural, with LMQQCC located to the north. The site is relatively isolated with the closest existing urban area (Denman Prospect) located south of the southern boundary of the site. The ACT Heritage Register lists the property known as Huntly as having heritage significance and covers the majority of the site (Figure 7-2). The ACT Heritage Register notes that Huntly is representative as an element of the rural setting of the National Capital and notes that it is to be preserved as a rural property.  Figure 7-2 | Huntly heritage listed land The site also contains a nominated heritage place identified as 'Travelling Stock Route', which is likely to be of heritage significance as former remnants of rural industry in the area and would place a future constraint on development in this area. A Cultural Area (CCA2) was also identified in this investigation area and conservation of this Cultural Area may be required. Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in the restricted Attachment A. There are multiple registered Aboriginal places across the area, and it is noted that there may be additional Aboriginal places which are not yet on the Register. Given the lack of spatial data available on these places, future development planning will need to consider information gaps, along with additional heritage assessment in accordance with the operating statutory framework at the time.
Road Access	Access to the site is via Uriarra Road only, which presents a significant constraint for urban development. An additional bridge over the Molonglo River would likely be required for vehicular access to this site.
Evo Energy	132KV High Voltage overhead lines run east-west from the Murrumbidgee to the Spring Valley Farm (owned by ANU) and then onward to the Molonglo Valley.
Transgrid	330KV high Voltage overhead line traverses north-south through the investigation area.
Gas Infrastructure	There is no gas infrastructure within the site.

Uriarra Ridge Investigation Area	
Icon Water Infrastructure	A bulk water supply runs north from the Stromlo Water Treatment Plant and crosses the eastern portion of the site.
Sewer Infrastructure	There is no reticulated wastewater infrastructure within the site. The area to the north of Uriarra Road that slopes towards the Molonglo River could potentially be gravity fed, however would require a new crossing of the Molonglo River. It is noted that the northern portion of the site is within the 2.4km buffer of LMWQCC.
Slope	Gentle gradients of less than 10% on each side of Uriarra Road.
Soils	Mostly *Burra* soils with some areas of rocky outcrop that could present challenging geotechnical conditions for urban development.
Visual Impact	Land each side of Uriarra Road is elevated however views towards the area from existing suburbs are mostly blocked by the ridge line north of Mount Stromlo.
Vegetation and Habitat	The central portion of the site provides opportunity for habitat connectivity between the Molonglo River corridor, located to the north, and the Murrumbidgee River corridors, located to the west. Vegetation in the central part of the site consists predominantly of Box Gum Woodlands. The existing ecology surveys confirm the potential for Little Eagle Breeding Habitat across most of the area, small areas of Superb Parrot Breeding Habitat and potential habitat for the EPBC listed Golden Sun Moth in the south adjacent to the Molonglo River Reserve. The area also contains potential habitat for Pink-tailed Worm-lizard, as well as along the Murrumbidgee River corridor and further surveys will be required to determine the extent of habitat for this species.
Waterways	Multiple waterways, including Cliffs Creek in the north and Stoney Creek in the south, and a number of existing farm dams extending from Uriarra Road and draining toward the Molonglo River or Murrumbidgee River.

Nearby current and planned projects include:

- LMWQCC projects relating to biosolids management and wastewater processing
- Potential changes to buffer surrounding LMWQCC
- North Denman future urban area
- East West Arterial Road
- John Gorton Drive 3C

Table 7–4 | Strengths and Weaknesses of the Uriarra Ridge Investigation Area

Opportunities	Challenges
Rolling hills with reasonable slope	Sewer servicing would require a new crossing of the Molonglo River to LMWQCC
Development could occur on each side of Uriarra Road	Vehicular connectivity is restricted to movements along Uriarra Road. Additional vehicular connectivity north or south would be required to support transport planning and movement of people and goods to/from the investigation area
Excellent views of the surrounding mountain ranges	Reasonably isolated
Peri-urban uses such as rural residential and lifestyle blocks	Huntly Heritage listed land comprises much of the site.
Eco-tourism uses	There would need to be a reasonable density of development to make the infrastructure costs feasible
	Limited heritage assessment of this area has been undertaken
	Presence of Superb Parrot habitat and breeding sites

Based upon the outcomes of the Visioning Workshop held on 28 July 2022 and the above assessment of the investigation area, it is suggested that the following land uses may warrant further investigation in the scenario development:

- Adaptive reuse of heritage homestead
- Eco-tourism.

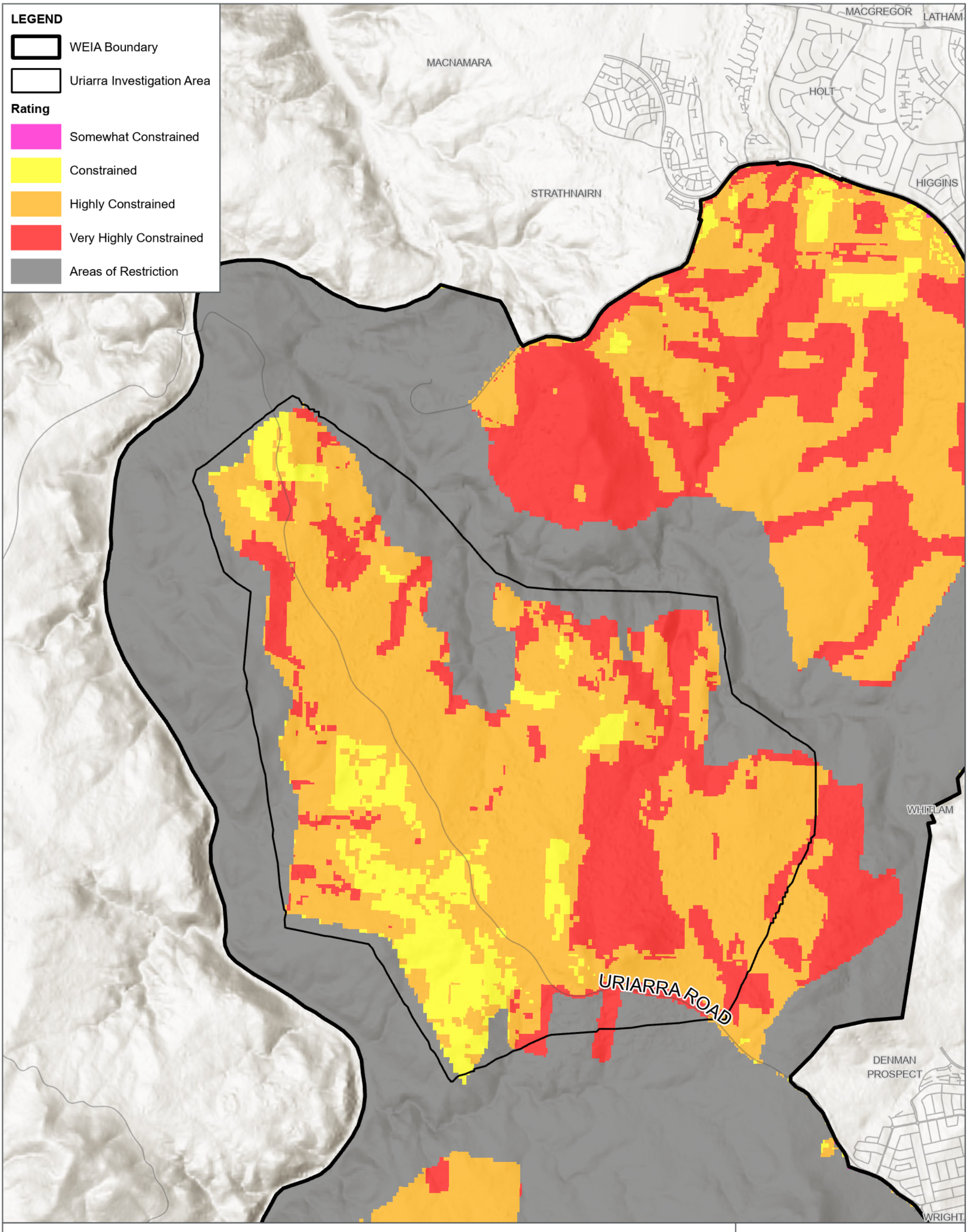


FIG NO. 7-3

FIGURE TITLE Uriarra Ridge Investigation Area

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 Km

1:30,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

7.3 West Molonglo Investigation Area

The West Molonglo Investigation Area has an area of 1,785ha and extends west from Wright in the Molonglo Valley. The investigation area includes a large area of restriction 'excluded' land owing to established recreational uses and infrastructure in Stromlo. The remaining urban capable land extends to the west of these established uses and as such, lacks connectivity to existing development in Canberra. Due to topography, this area is very difficult to service with sewer.

An analysis of key characteristics is provided in Table 7–5 with a summary of opportunities and challenges in Table 7–6, followed by future land use visioning.

Table 7–5 | Analysis of characteristics of the West Molonglo Investigation Area

West Molonglo Investigation Area	
Bushfire	Mostly low bushfire risk with areas of higher risk located towards the eastern boundary of the area. Emergency access could be a concern without additional north or south connectivity.
Planning and Zoning	A significant portion of the investigation area is designated land identified as Mount Stromlo and Mount Stromlo Forest Park and has therefore been identified as an area of restriction and excluded. It is noted that the 'Mount Stromlo Observatory Precinct, Mt Stromlo Rd, Mt Stromlo, ACT, Australia' is listed on the Commonwealth Heritage List. Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in the restricted Attachment A. There are multiple registered Aboriginal places across the area, and it is noted that there may be additional Aboriginal places which are not yet on the Register. Given the lack of spatial data available on these places, future development planning will need to consider information gaps, along with additional heritage assessment in accordance with the operating statutory framework at the time.
Road Access	Cotter Road is the only major road that runs along the southern boundary of the site and divides the West Molonglo and Bulgar Creek investigation areas. Uriarra Road runs along the north eastern boundary of the site and separates the West Molonglo investigation area from Denman Prospect. Mount Stromlo Road provides access to the Mount Stromlo Observatory.
Evo Energy	There is a HV overhead electricity line running along Cotter Road as well as an overhead transmission line running through the centre of the site in a north south direction.
Transgrid	The 330KV National Grid high voltage transmission line runs north-south through the centre of the site.
Gas Infrastructure	The only gas infrastructure is a pipe that runs west along Cotter Road and onto Mount Stromlo Road servicing the Mount Stromlo Observatory.
Icon Water Infrastructure	A bulk water supply main runs along Cotter Road to the Stromlo Water Treatment Plant.
Sewer Infrastructure	There are no sewer lines located within the site. Sewer servicing would require a new crossing of the Molonglo River to LMWQCC and a series of micro tunnels.
Slope	Slopes in the western section of the investigation area are generally under <10% and north of Cotter Road having a slope of less than 20%.
Soils	The soil type is mainly *Burra* with some amount of *Campbell variant c* located towards the centre of the investigation area.
Visual Impact	The scenic quality values plus scenic priority scores are mainly between 20.5-24.5 with some parts along the north-eastern boundary having scores as high as 29-34.
Vegetation and Habitat	The investigation area provides an opportunity for habitat connectivity from the Mount Stromlo Forest Park to the Murrumbidgee River Corridor. There are some existing significant areas of Box Gum Woodland throughout the site including threatened plant species around the Mount Stromlo Observatory. Potential habitat for species including the Little Eagle occurs throughout most of the site as well as small areas of habitat for the Superb Parrot and Pink-tailed worm lizard.
Waterways	The Murrumbidgee River corridor is located along the western boundary of the site and there are a number of small watercourses throughout the site. Stony Creek is located along the northern boundary of the investigation area and provides an opportunity to improve connectivity to the Murrumbidgee River.

Nearby current and planned projects include:

- East-West Arterial Road
- Stromlo District Playing Fields

Table 7–6 | Strengths and Weaknesses of the West Molonglo Investigation Area

Opportunities	Challenges
Provides opportunity to provide additional connectivity between the Mount Stromlo Forest Park and Murrumbidgee River	Sewer servicing would require a new crossing of the Molonglo River to LMWQCC and a series of micro tunnels
Potential to connect into the existing active travel network to the service the area	Vehicular connectivity is restricted to movements along Cotter Road. Additional vehicular connectivity north or south would be required to support transport planning and movement of people and goods to/from the site.
Woodlands in the area may be beneficial for the purpose of offsets	Reasonably isolated
Proposes development on the northern side of Cotter Road, which could be consider in conjunction with the Bulgar Creek Investigation Area	Could create an isolated pocket of development
	Limited heritage assessment of this area has been undertaken
	Presence of Superb Parrot habitat and breeding sites

Based upon the outcomes of the Visioning Workshop held on 28 July 2022 and the above assessment of the investigation area, it is suggested that the following land uses may warrant further investigation in the scenario development:

- Tourism and farm uses
- Recreation precinct

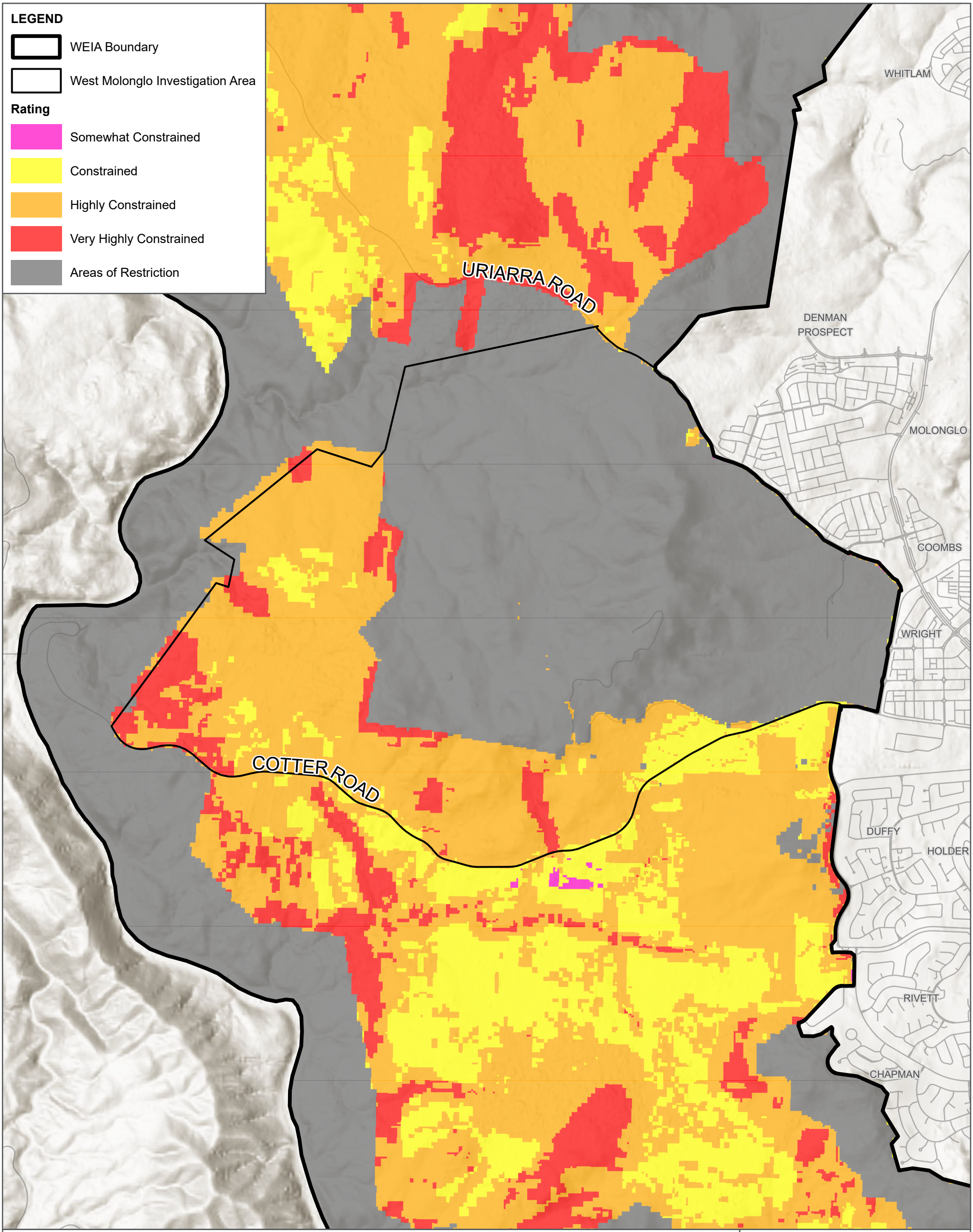


FIG NO. 7-5

FIGURE TITLE West Molonglo Investigation Area

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 Km

1:30,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

Location: C:\GIS\NSW\Outgoing\3002862 Western Edge Investigation Area\02_Maps\WEIA Urban Planning\ArcGIS Masterfile\ArcGIS Masterfile.aprx

Last updated by: LL16284 on 14/12/2022 at 18:53

7.4 Bulgar Creek Investigation Area

The Bulgar Creek Investigation Area is a very large parcel of land (approx. 1,500 ha) extending west of existing development in Weston Creek, and south of Stromlo Forest Park, Mount Stromlo Observatory and Mount Stromlo Water Treatment Plant.

This investigation area neighbours existing urban development in Weston Creek and is accessed via the westernmost extent of Hindmarsh Drive, Eucumbene Drive and Cotter Road. The investigation area is located south of Stromlo Forest Park and has reasonable access to the Weston Group Centre, future Molonglo Group Centre, schools, community facilities, public transport and the ACT road network. If the capacity of existing infrastructure permits, there may be the potential to readily extend existing utility services from the adjoining suburbs into this site.

An analysis of key characteristics is provided in Table 7–7, with a summary of opportunities and challenges in Table 7–8 followed by future land use visioning.

Table 7–7 | Analysis of characteristics of the Bulgar Creek Investigation Area

Bulgar Creek Investigation Area	
Bushfire	Predominantly low bushfire risk category with some high risk pockets in the south and interspersed in the middle of the site.
Planning and Zoning	The site is predominantly classified as NUZ2 *Rural* with the area along the north-eastern boundary as *Designated Areas* under the National Capital Plan. While Designated Areas may be subject to development in the future, further investigation and consultation with the National Capital Authority would be necessary and would require amendment of the National Capital Plan. Nearby land uses include the Stromlo Forest Park, the Stromlo Observatory (and associated light limitation zone), as well as adjoining residential suburbs. A site complex) is located in the north east portion of the area and a registered heritage place identified as 'Greenhills Ruin' is located in the north west section of the area. Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in restricted Attachment A. There are multiple registered Aboriginal places across the area, and it is noted that there may be additional Aboriginal places which are not yet on the Register. Given the lack of spatial data available on these places, future development planning will need to consider information gaps, along with additional heritage assessment in accordance with the operating statutory framework at the time.
Road Access	The area has good connectivity into the existing ACT Road network. Cotter Road runs along the northern boundary of the site and divides the West Molonglo and Western Creek Investigation Areas. Eucumbene Drive runs on the eastern boundary of the site and adjoins the western extent of Hindmarsh Drive.
Evo Energy	A High Voltage Overhead electricity line and overhead transmission electricity line pass through the site. The HV overhead electricity line is also located along the north eastern edge of the site bordering Duffy.
Transgrid	The 330KV National Grid high voltage transmission line runs north-south through the centre of the site.
Gas Infrastructure	The only gas infrastructure is a gas pipe with some gas fittings located along the eastern boundary edge of the site.
Icon Water Infrastructure	A bulk water supply main runs along Cotter Road to the Stromlo Water Treatment Plant. An existing reservoir is located on the north-eastern edge of the site.
Sewer Infrastructure	There is no existing sewer servicing within the investigation area. Sewer servicing for this investigation area could be possible via a sewer pump station and new easement connecting into the MVIS. Further consultation with Icon Water would be necessary as part of infrastructure planning and feasibility studies.
Slope	The terrain is mainly flat with a gradient of less than 10% with some pockets of land to the north and east of the site having a slope of less than 20%
Soils	The soil type is mainly *Williamsdale* with some amount of *Burra* located on the eastern side of the site.
Visual Impact	The scenic quality values plus scenic priority scores are mainly between 20.5-24.5 with some parts along the north-eastern boundary having scores as high as 29-34.

Bulgar Creek Investigation Area	
Vegetation and Habitat	A significant area of *Nature Conservation Act 2014* Box Gum Woodland in the south of the site should be retained in open space as this is potentially remnant woodland. The use of Bulgar Creek as a green corridor throughout the area would increase overall connectivity. There is potential Little Eagle breeding habitat located to the north of the site, and tree canopy connectivity corridors should be considered in the scenario development. It is noted that there are areas of Pink-tailed Worm-lizard habitat located in the eastern section of the area as well as areas of suitable Superb Parrot breeding habitat. Further surveys would need to be undertaken to determine the extent of habitat for these species.
Waterways	Bulgar Creek and Holdens Creek run through the area. Many of the creek lines and higher order tributaries appear to be in poor condition and show signs of erosion. There is the opportunity to restore these creek lines and utilise them as blue-green corridors for stormwater management, urban amenity and as habitat corridors.

Nearby current and planned projects include:

- Molonglo Group Centre
- Molonglo East-West Arterial Road
- John Gorton Drive 3C
- Stromlo District Playing Fields
- LMWQCC projects relating to biosolids management and wastewater processing
- North Denman future urban area
- Potential nature reserve at Blewitts Block

Table 7–8 | Strengths and Weaknesses of the Bulgar Creek Investigation Area

Opportunities	Challenges
Relatively gently sloping land would permit a variety of land uses	Balancing population densities with employment, mixed use development and opportunities for containment to reduce impact on the ACT road network – particularly east-west movements
Providing improved connectivity to the Cotter Dam for recreation purposes	Development should occur on both sides of Cotter Road to maximise connectivity to the existing road network
Excellent access to community recreation facilities at Stromlo Forest Park	Connectivity north and south
Continuation of Hindmarsh Drive provides good access to public transport and existing road network	Limited heritage assessment of this area has been undertaken
Potentially the site can be serviced by a sewer pump station to the MVIS	Presence of Superb Parrot habitat and breeding sites
Water servicing may be readily accommodated noting existing reservoir on the eastern side of the site	

Based upon the outcomes of the Visioning Workshop held on 28 July 2022 and the above assessment of the investigation area, it is suggested that the following land uses may warrant further investigation in the scenario development:

- Entertainment precinct
- Containment to provide employment and reduce impact on east-west movements
- Mixed use development
- Residential development
- Schools, community infrastructure
- Combined with the Kambah or West Molonglo investigation areas, this area could have enough population to justify a group centre

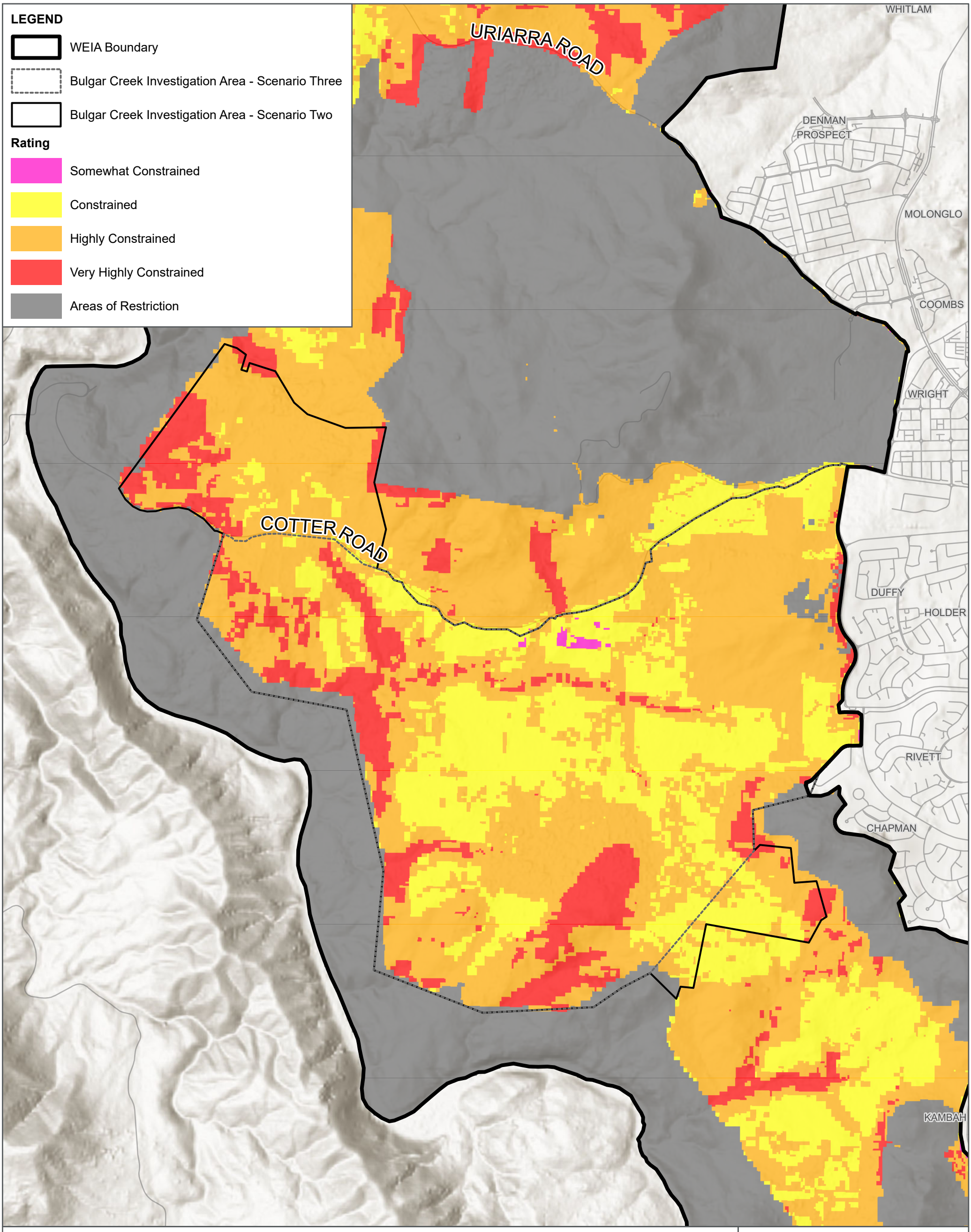


FIG NO. 7-5

FIGURE TITLE Bulgar Creek Investigation Area

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

N

0 0.5 1 Km

1:30,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

7.5 Kambah Investigation Area

The Kambah Investigation Area is a parcel of land approximately 668 ha in size with access primarily from Kambah Pool Road. The 330KV National Transmission line passes through this area, along with a 132KV HV line. This area is surrounded by nature reserves, with Cooleman Ridge on the east and the Murrumbidgee River Corridor on the west. Connectivity to McQuoid's Nature Reserve has been considered to ensure it is not isolated because of development.

An analysis of key characteristics is provided in Table 7–9, with a summary of opportunities and challenges in Table 7–10, followed by future land use visioning.

Table 7–9 | Analysis of characteristics of the Kambah Investigation Area

Kambah Investigation Area	
Bushfire	Predominantly low bushfire risk category with some areas of high risk to the southwest along the edge of the site and in the middle of the site. There is a high bushfire risk in the area of restriction 'excluded' rating area outside the boundary along the Murrumbidgee river.
Planning and Zoning	The site is predominantly classified as NUZ2 *Rural Urban Open Space* with a small marginal area to the southeast of the site as *Designated Land* and a smaller area to the west of the site as *River Corridor* along the creek. It is noted that there are multiple heritage constraints within the site including a Cultural Conservation Area and Old Growth Eucalyptus trees which may require further heritage investigation to assess the development potential of this area. Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in the restricted Appendix A. There are multiple registered Aboriginal places across the area, and it is noted that there may be additional Aboriginal places which are not yet on the Register. Given the lack of spatial data available on these places, future development planning will need to consider information gaps, along with additional heritage assessment in accordance with the operating statutory framework at the time to better understand development potential.
Road Access	There are no existing roads within the site with the Murrumbidgee River located to the Southwest outside the investigation area boundary and a number of waterline creeks flowing from the north west into the river. Kambah Pool Road is located on the southern boundary of the site.
Evo Energy	A High Voltage Overhead electricity line and overhead transmission electricity line pass through the investigation area. Along the southeast boundary edge of the site, there is both a high voltage and low voltage underground electricity line.
Transgrid	The 330KV High Voltage overhead transmission line associated with the National Grid traverses north-south through the centre of the site.
Gas Infrastructure	Gas infrastructure within this site is limited to existing gas meters and fittings in the south of the area.
Icon Water Infrastructure	There is a bulk water main passing along the eastern boundary of the investigation area.
Sewer Infrastructure	There is no existing sewer infrastructure within the site. Servicing of the western part of this site would be particularly challenging and sewer tunnels would likely be required to accommodate topography in this area.
Slope	The terrain is mainly flat with a slope gradient of less than 10% with very small pockets near the waterlines having a slope of less than 20%
Soils	The soil type is mainly *Williamsdale* with small amounts of *Burra.* There are some Stormwater Management buffer and Environmental offset zones along the south western edge of the site.
Visual Impact	The scenic quality values plus scenic priority scores are generally between the values of 3-9 with some parts in the north west of the investigation area and near the waterlines having value scores between 20.5- 24.5
Vegetation and Habitat	The vegetation includes *NC Act Box Gum Woodlands* with few potential areas of *Golden Sun Moth* and small pockets of *Potential Little Eagle Breeding Habitat* along the waterlines.
Waterways	A number of waterlines run through the site including Station Creek. Potential to use this as a connectivity corridor and blue-green spine for future development.

Table 7–10 | Strengths and Weaknesses of the Kambah Investigation Area

Opportunities	Challenges
Connectivity through blue-green grid using existing waterways	Sewer servicing would require extensive new trunk infrastructure and a new crossing of the Molonglo River to LMWQCC, or a sewer pump station
Use active travel networks to provide fire breaks/APZs	Vehicular connectivity is restricted to movements along Kambah Pool Road. Additional vehicular connectivity north or south would be required to support transport planning and movement of people and goods to/from the site.
Potential to improve habitat values in the area and restore connectivity linkages	Limited heritage assessment of this area has been undertaken
Views and proximity to nature	Presence of Superb Parrot habitat and breeding sites
Access to recreation areas along Murrumbidgee River	
Connectivity into adjoining established suburbs	
Good connectivity into wider ACT arterial road network	

Based upon the outcomes of the Visioning Workshop held on 28 July 2022 and the above assessment of the investigation area, it is suggested that the following land uses may warrant further investigation in the scenario development:

- Low density residential with some areas of medium density
- Central local centre (sized depending on density)
- Primary school (depending on density and educational needs assessment)

LEGEND

- WEIA Boundary
- Kambah Investigation Area - Scenario Three
- Kambah Investigation Area - Scenario Two

Rating

- Somewhat Constrained
- Constrained
- Highly Constrained
- Very Highly Constrained
- Areas of Restriction

DUFFY
HOLDER
WESTON
RIVETT
STIRLING
WARAMANGA
CHAPMAN
FISHER
KAMBAH

N

0 0.5 1
Km
1:20,000

FIG NO. 7-6

FIGURE TITLE Kambah Investigation Area

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au © Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

8. Indicative Development Scenarios

The capability assessment resulted in areas of restriction and rated the constraints that were collated for the WEIA against the agreed criteria. The capability assessment also resulted in areas for further investigation that were then configured into smaller areas / clusters for the suitability assessment. This section of the report details the investigation into potential development scenarios for the suitable land.

The boundaries of the investigation areas are somewhat arbitrary and could be subject to change in the future. To define the boundary of future urban areas, detailed analysis of site conditions including targeted ecological and heritage studies, and infrastructure master planning will be required. Due to the high level nature of this project, these detailed assessments have not been undertaken as part of this analysis.

8.1 Important Notes

The outcomes of the capability and suitability assessment were used as the basis for the preparation of three indicative development scenarios:

- Land Use Scenario One – a 'no impact' approach acknowledging the presence of all ecological values (identified and potential habitat, as well as listed vegetation under ACT and Commonwealth legislation). This scenario demonstrates that there are very few areas in the WEIA that do not have some degree of ecological significance.
- Land Use Scenario Two – an approach driven by maintaining and enhancing habitat connectivity in balance with development outcomes.
- Land Use Scenario Three – an approach driven by connectivity to infrastructure, roads and efficiency of land use.

Merge of Bulgar Creek and West Molonglo Investigation Areas

A large portion of the West Molonglo investigation area is dedicated to the Stromlo Forest Park recreation area, Stromlo Observatory and Icon Water infrastructure. It was confirmed that this area should be identified as an area of restriction and excluded from this assessment, as it is not urban capable.

The remaining land within the West Molonglo Investigation area was too small and was deemed unfeasible for development in isolation. In the Scenario Workshop, it was decided to merge the Bulgar Creek Investigation Area (in Scenario Three) to include the more readily serviceable parts of the West Molonglo area, on the northern side of Cotter Road.

Land Use Assumptions

The following land use assumptions are adopted across the three indicative development scenarios:

- Nature Reserves shows existing nature reserves that are present within the study area.
- Potential conservation shows areas with identified ecological sensitivity that should be avoided, or impacts would need to be mitigated / offset.
- Potential habitat connectivity corridors show high level assumptions of the linkages between areas of ecological sensitivity. These are indicative only and would require further targeted ecological survey to confirm width and configuration of corridors, depending on the species movements they are intended to support.
- Further investigation is needed for an area within the Central Molonglo Investigation Area which may not be 'urban suitable', but which could have other suitable such as for waste management or resource recovery.
- Potential Future Development covers land that the land use capability and suitability assessment has identified as potentially urban capable. These areas warrant further investigation through site specific studies and master planning which can consider road access, land use typology and infrastructure placement.

Further Studies Required

The Indicative Development Scenarios provide a basis for ongoing investigation and testing of the capability and suitability for urban development of the WEIA. It is intended that the scenarios be used as a benchmark for further studies and determination of urban development viability. Further targeted environmental, heritage, traffic, hydrology and infrastructure investigations are required as part of future feasibility studies for each investigation area. These site specific studies will provide additional important information to refine and confirm indicative development areas.

8.2 Scenario One Overview

Scenario One has been developed to present a "no impact" or "do nothing" approach to development in the WEIA. The only land identified as 'potential future development' is land which does not have ecological sensitivity. This scenario indicates that Bulgar

Creek holds the largest consolidated area of potentially developable land accessible from Cotter Road. Potential development areas are also shown in Kambah however access from Kambah Pool Road appears constrained.

An area of potentially developable land is also located along the south-western side of Uriarra Ridge. This area is considered in Scenario Two and Three, and it is noted that providing sewerage connection to this low lying area may be difficult.

An overview of Scenario One is provided in Figure 8-1. Overviews of Scenario Two and Scenario Three follow in Figure 8-2 and Figure 8-3, respectively. A summary comparison is provided in Table 8-1, with an in-depth comparison of development areas in each cluster provided in the following sections.

Table 8–1 | Summary Comparison of Scenario Two and Three

	Scenario Two – Connectivity focus	Scenario Three – Growth focus
Area of WEIA	9,800ha	9,800 ha
Total Green Space (i.e. existing and potential conservation)	3,541ha	3,282ha
Percentage of total area	36%	33%

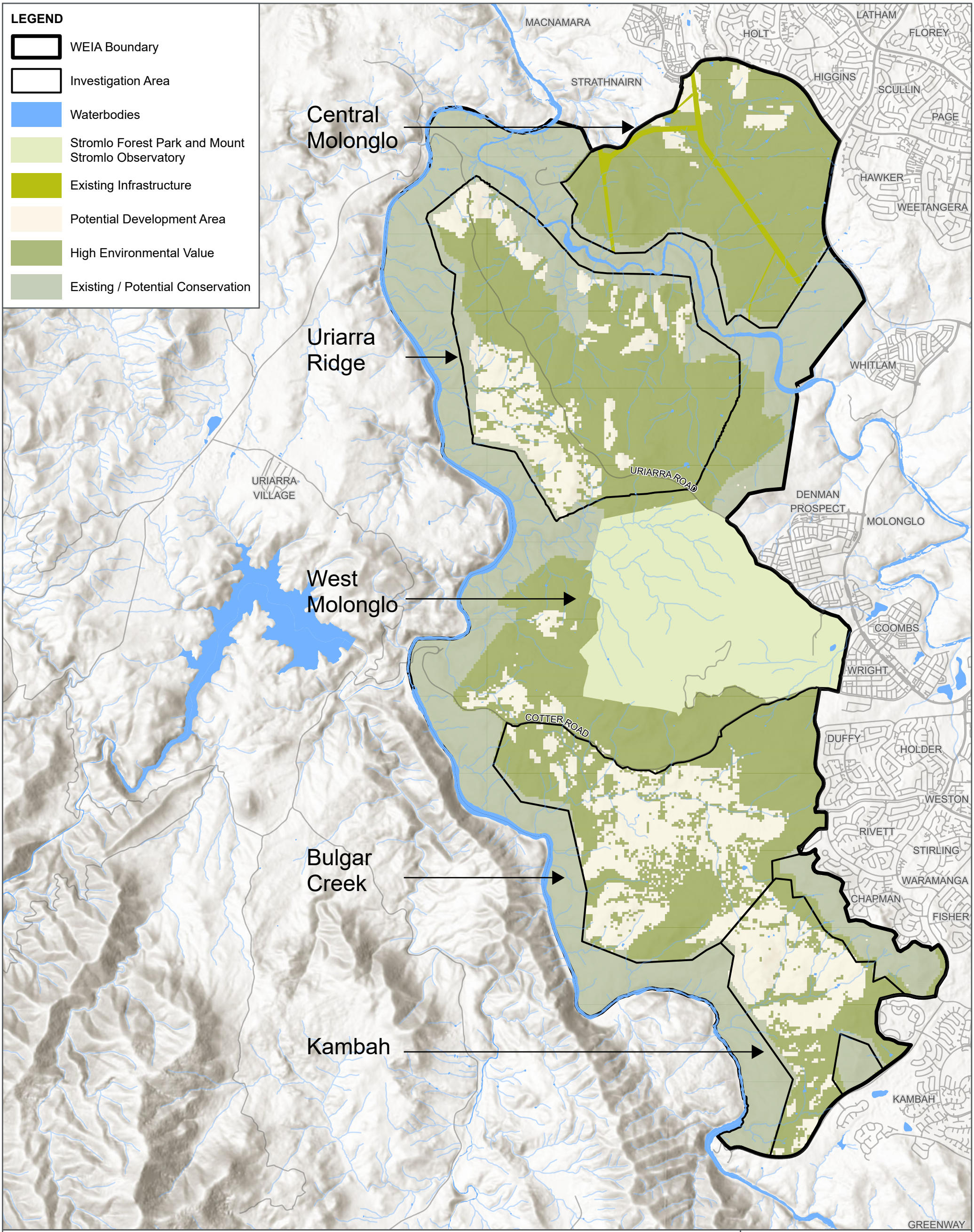


FIG NO. 8-1 **FIGURE TITLE** Scenario One Overview

PROJECT TITLE Western Edge Investigation Area - Capability and Suitability Assessment

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

LEGEND

- WEIA Boundary
- Investigation Area
- Waterbodies
- Stromlo Forest Park and Mount Stromlo Observatory
- Superb Parrot nesting and potential breeding habitat
- Nature Reserves
- Potential habitat connectivity corridors

Potential Land Use

- Potential Future Development
- Rural or Open Space Uses
- Potential Conservation Area
- Further Investigation Needed

Central Molonglo

Uriarra Ridge

West Molonglo

Bulgar Creek

Kambah

MACNAMARA
STRATHNAIRN
HOLT
LATHAM
MELBA
FLOREY
HIGGINS
SCULLIN
PAGE
HAWKER
WEETANGERA
WHITLAM
URIARRA VILLAGE
URIARRA ROAD
DENMAN PROSPECT
MOLONGLO
COOMBS
WRIGHT
COTTER ROAD
DUFFY
HOLDER
WESTON
RIVETT
STIRLING
WARAMANGA
CHAPMAN
FISHER
KAMBAH

FIG NO. 8-2 **FIGURE TITLE** Scenario Two Overview

PROJECT TITLE Western Edge Investigation Area - Scenario Two

N

0 0.5 1 2 3 Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

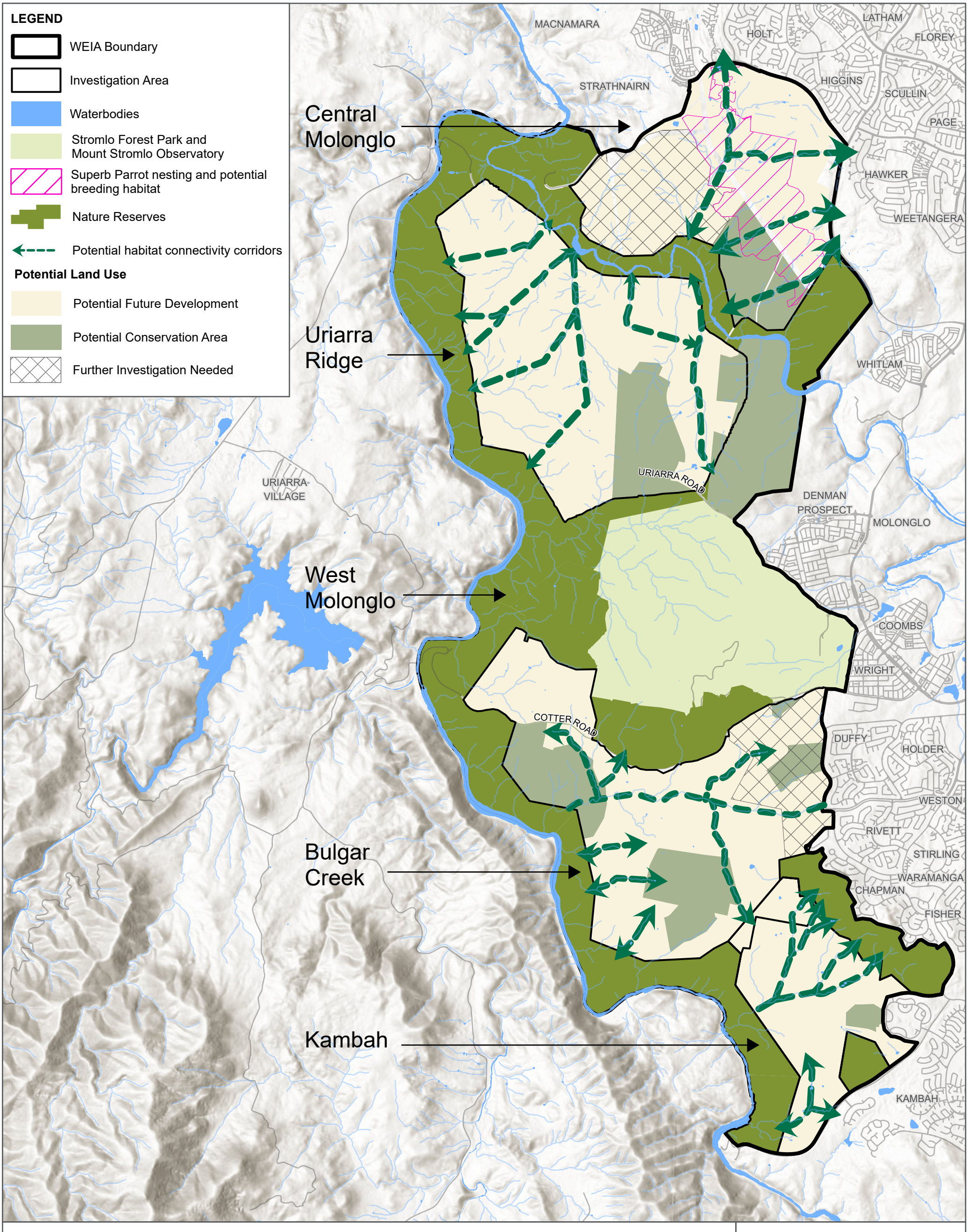


FIG NO. 8-3

FIGURE TITLE Scenario Three Overview

PROJECT TITLE Western Edge Investigation Area - Scenario Three

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

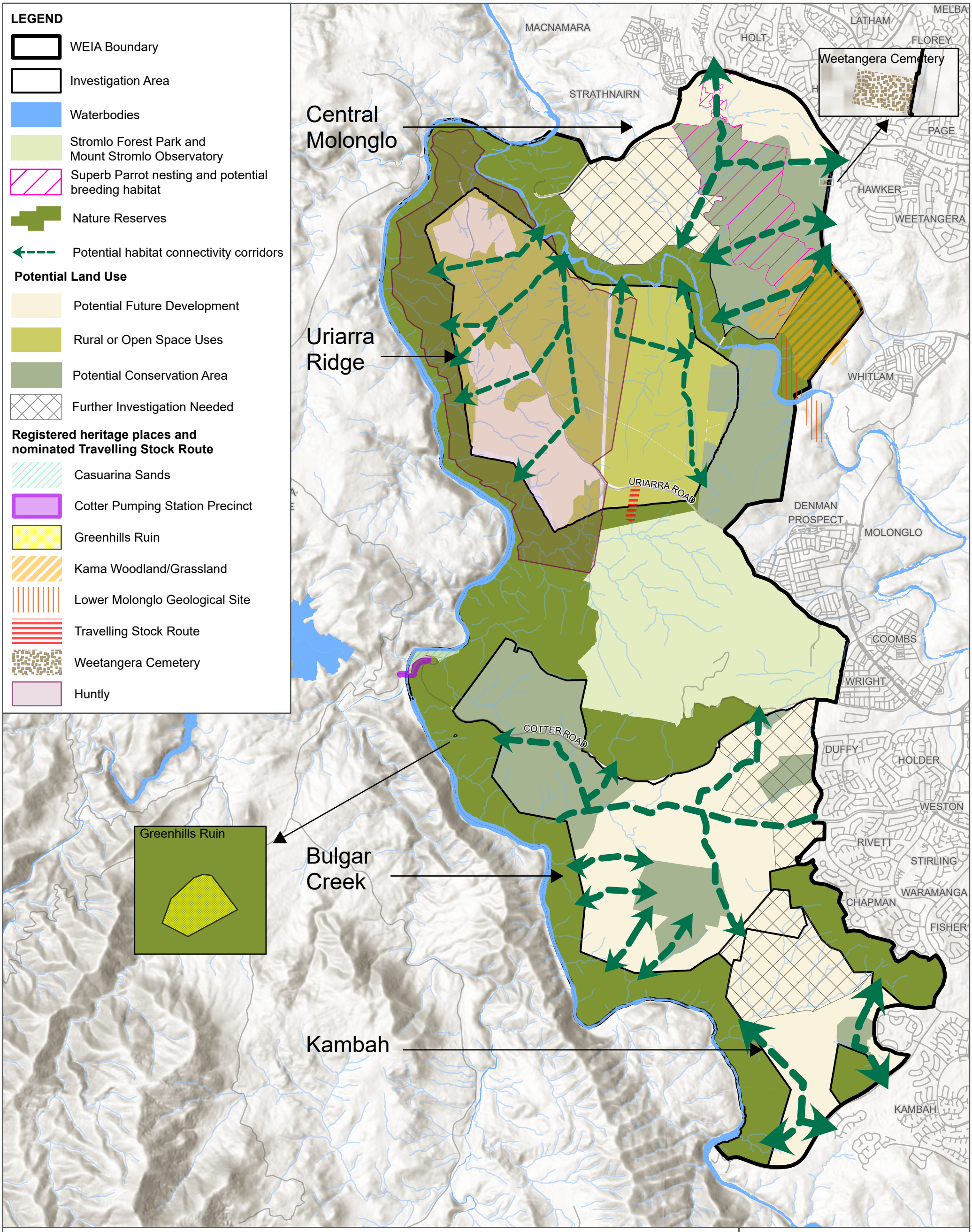


FIG NO. 8-4 **FIGURE TITLE** Scenario Two Overview Heritage Information

PROJECT TITLE Western Edge Investigation Area - Scenario Two

N

0 0.5 1 2 3

Km

1:60,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

8.3 Central Molonglo Investigation Area

The indicative development scenarios prepared for the Central Molonglo Investigation Area present a considerable difference in the area of potential developable land, owing to the presence of the Molonglo Colony of the Superb Parrot.

Areas of Central Molonglo have been highlighted as providing important habitat for the Superb Parrot, which is currently listed as vulnerable under the EPBC Act and NC Act. The Capital Ecology Preliminary Ecological Review (2021) confirmed an area of potential habitat which extends over much of the eastern portion of the investigation area. In addition, a 200 metre buffer was requested by PCS during the course of this engagement around a breeding location in Central Molonglo. This is shown as hatched in both scenarios.

A comparison of the development options in the Central Molonglo Investigation Area across scenarios two and three is provided in the tables below. Of particular note is that the potential future development area increases from 51% to 75% of the investigation area. To inform further consideration of options for this region, it is highly recommended that further studies be undertaken to confirm the presence of Superb Parrot breeding areas and options to avoid and minimise risk to the Molonglo Colony.

It is noted that land identified as potential future development in areas of high heritage sensitivity, as identified in GML (2020) and the ACT Heritage Register (Figure 8-7) will require additional heritage assessment to confirm the suitability of these areas for development. As noted, mapping showing sensitive Aboriginal places recorded on the ACT Heritage Register and GML (2020) is identified in the restricted Attachment A.

A hatched overlay has also been incorporated for land in the south-western portion of the site. The capability assessment identified this land as being constrained due to topography, however the land otherwise appears to be reasonably unconstrained. Options for appropriate land uses on this portion of the site should be further investigated as part of a master planning process.

Table 8–2 | Overview of Central Molonglo Scenario Two

Central Molonglo – Scenario Two	Area (ha)	% Distribution
Total Investigation Area	1,240	-
Potential Future Development	630	51%
Potential Conservation Area	608	49%

Table 8–3| Overview of Central Molonglo Scenario Three

Central Molonglo – Scenario Three	Area (ha)	% Distribution
Total Investigation Area	1,240	-
Potential Future Development	927	75%
Potential Conservation Area	239	19%

The Central Molonglo Investigation Area is located to the west of the Heritage Listed Kama Nature Reserve and includes the Lands End property and the heritage listed Weetangera Cemetery. It is noted that the Lands End property is not listed in the ACT Heritage Register, however this does not preclude the property from being conserved as a place of historic interest. There is no change proposed in the Kama Nature Reserve in either scenario. It is assumed that asset protection zones that may be required for future development would be sited within the development footprint and would not require modifications to the fire management practices within both Kama Nature Reserve and the Molonglo River Reserve which adjoin the investigation area to the south and east.

Indirect impacts would need to be considered in a more detailed environmental analysis and feasibility study of the investigation area. Additional heritage studies would also be required to confirm appropriate development curtilage for Lands End and Weetangera Cemetery. A more detailed breakdown of the percentage of the Central Molonglo Investigation Area that may have conservation values is provided in the following table.

Table 8–4 | Percentage of Central Molonglo Investigation Area that may have conservation values

Scenarios	2	3	2	3	2	3	2	3
Assets	Potential – High Value Environmental Significance		Potential - White box - yellow box - Blakely's red gum grassy woodland and derived native grassland		Potential - Natural Temperate Grassland of the South Eastern Highlands		Potential – Pink-tailed worm-lizard	
Central Molonglo (ha)	522	853	98	267	6	6	115	115

It is noted that previous government recommendations have included that a significant portion of this area be removed in perpetuity from being considered as a future urban area. These past recommendations will need to be reconsidered in light of further studies and evolving needs.

LEGEND

- WEIA Boundary
- Investigation Area
- Waterbodies
- Superb Parrot nesting and potential breeding habitat
- Nature Reserves
- Potential habitat connectivity corridors

Potential Land Use

- Potential Future Development
- Further Investigation Needed
- Potential Conservation Area

N

0 0.5 1 Km

1:20,000

FIG NO. 8-5

FIGURE TITLE Central Molonglo Investigation Area Scenario Two

PROJECT TITLE Western Edge Investigation Area - Scenario Two

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

LEGEND

- WEIA Boundary
- Investigation Area
- Waterbodies
- Superb Parrot nesting and potential breeding habitat
- Nature Reserves
- Potential habitat connectivity corridors

Potential Land Use

- Potential Future Development
- Further Investigation Needed
- Potential Conservation Area

MACGREGOR
LATHAM
HOLT
HIGGINS
SCULLIN
HAWKER
WHITLAM
DENMAN PROSPECT
URIARRA ROAD

FIG NO. 8-6

FIGURE TITLE Central Molonglo Investigation Area Scenario Three

PROJECT TITLE Western Edge Investigation Area - Scenario Three

N

0 0.5 1 Km

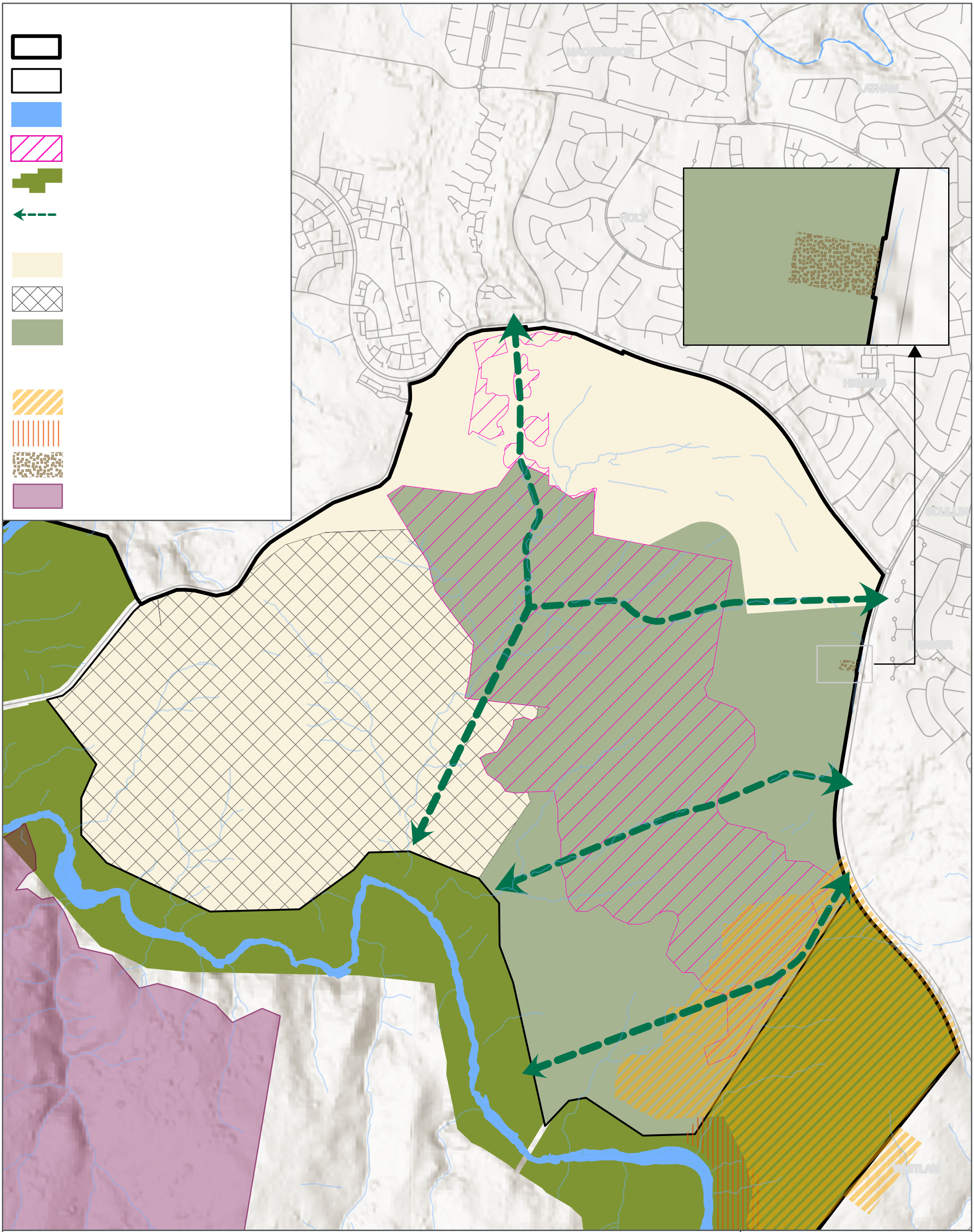
1:20,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group



N

SMEC
Member of the Surbana Jurong Group

8.4 Uriarra Ridge Investigation Area

As previously discussed, there are a number of challenges associated with development within the Uriarra Ridge investigation area. Currently, the area only has road access via Uriarra Road which does not provide sufficient redundancy for general traffic movements and emergency services. Whilst the area enjoys unimpeded views towards the Brindabella Ranges, the topography presents infrastructure challenges, particularly for sewer. The Uriarra Ridge Investigation Area also contains the heritage listed Huntly rural property.

Through the capability and suitability assessments it was determined that priority should first be given to development of other investigation areas within the WEIA. Whilst development of Uriarra Ridge may occur in the future, it is likely that this would be in the long term, after release of other investigation areas that are more readily serviceable with higher connectivity to existing and/or adjoining land uses.

It is noted that land identified as Potential Future Development in areas of high heritage sensitivity, as identified in GML (2020) and the ACT Heritage Register (Figure 8-10) will require additional heritage assessment to confirm the suitability of these areas for development. Mapping showing sensitive Aboriginal places recorded on the ACT Heritage Register and GML (2020) is identified in the restricted Attachment A.

The tables below provide a comparison of scenarios two and three for the Uriarra Ridge Investigation Area. The most significant difference is the area of potential future development which increases from 23% to 85%. Given the difficulties in servicing the land on the western side of Uriarra Road, it is unlikely that development of the reduced area shown in Scenario Two would be economically feasible.

Table 8–5 | Overview of Uriarra Ridge Scenario Two

Uriarra Ridge – Scenario Two	Area (ha)	% Distribution
Total Investigation Area	1,798	-
Potential Future Development	420	23%
Potential Conservation Area	51	3%
Rural or Open Space Uses	1,273	77%
Existing Infrastructure Corridors	54	3%

Table 8–6 | Overview of Uriarra Ridge Scenario Three

Uriarra Ridge – Scenario Three	Area (ha)	% Distribution
Total Investigation Area	1,798	-
Potential Future Development	1,525	85%
Potential Conservation Area	273	15%

A more detailed breakdown of the percentage of the Central Molonglo Investigation Area that may have conservation values is provided in the following table.

Table 8–7 | Percentage of Uriarra Ridge Investigation Area that may have conservation values

Scenarios	2	3	2	3	2	3	2	3
Assets	Potential – High Value Environmental Significance		Potential - White box - yellow box - Blakely's red gum grassy woodland and derived native grassland		Potential - Natural Temperate Grassland of the South Eastern Highlands		Potential – Pink-tailed worm-lizard	
Uriarra (ha)	125	891	26	225	N/A	23	114	239

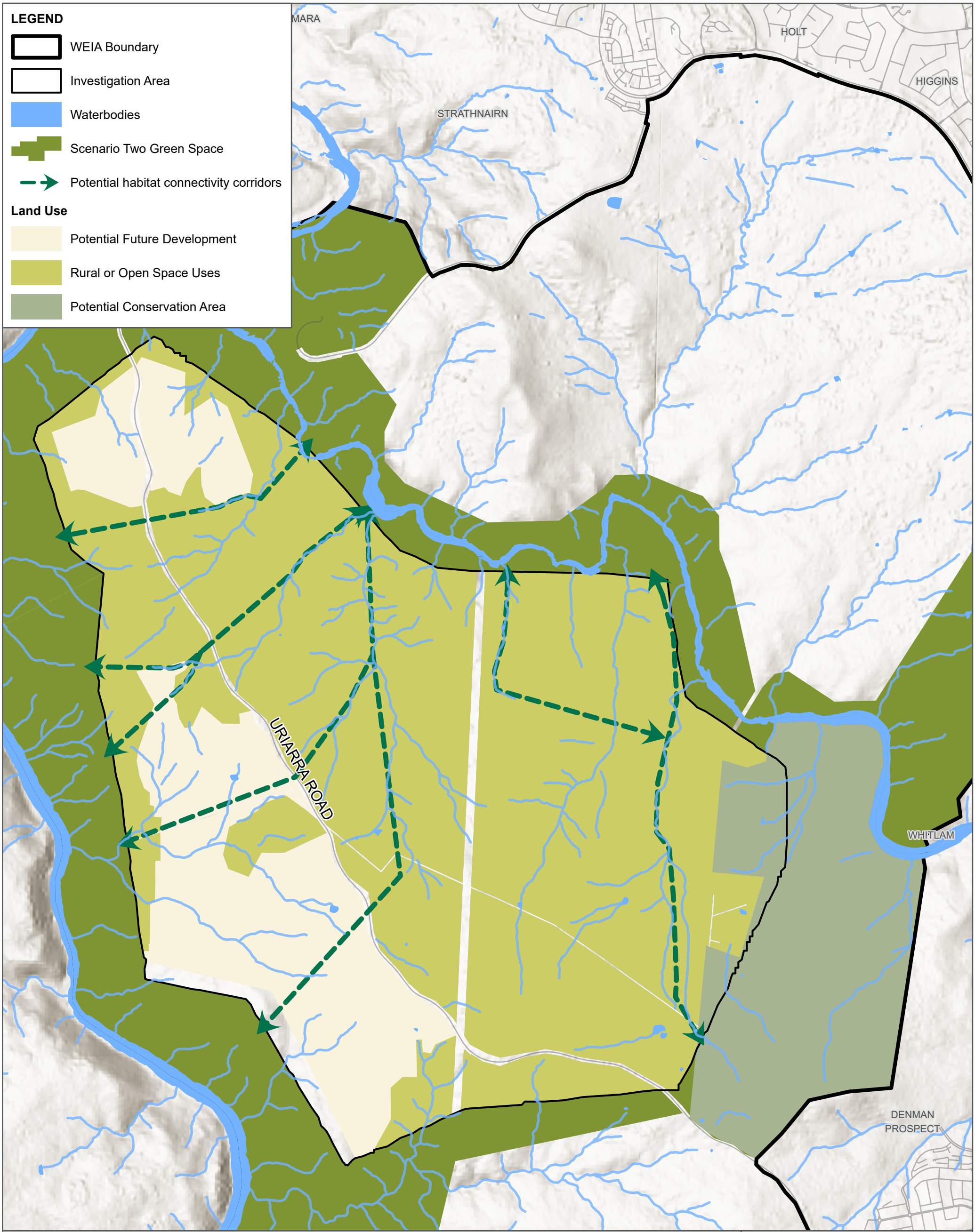


FIG NO. 8-8

FIGURE TITLE Uriarra Ridge Investigation Area Scenario Two

PROJECT TITLE Western Edge Investigation Area - Scenario Two

N

0 0.5 1 Km

1:25,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

Location: X:\Projects\30028\3002862 Western Edge Investigation Area\100 Concept Feasibility\GIS\Figures APRX\Investigation Area Maps\Investigation Area Maps _Draft2_20230120.aprx

Last updated by: LL16284 on 20/01/2023 at 17:58

LEGEND

- WEIA Boundary
- Investigation Areas
- Waterbodies
- Nature Reserves
- Potential habitat connectivity corridors

Potential Land Use

- Potential Future Development
- Potential Conservation Area

MACNAMARA
HOLT
HIGGINS
STRATHNAIRN
WHITLAM
DENMAN PROSPECT
WRIGHT

N

0 0.5 1 Km

1:30,000

FIG NO. 8-9

FIGURE TITLE Uriarra Ridge Investigation Area Scenario Three

PROJECT TITLE Western Edge Investigation Area - Scenario Three

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

LEGEND

- WEIA Boundary
- Investigation Area
- Waterbodies
- Scenario Two Green Space
- Potential habitat connectivity corridors

Land Use

- Potential Future Development
- Rural or Open Space Uses
- Potential Conservation Area

Registered heritage places and nominated Travelling Stock Route

- Kama Woodland/Grassland
- Travelling Stock Route
- Huntly

MACGREGOR
MACNAMARA
HOLT
STRATHNAIRN
URIARRA ROAD
URIARRA VILLAGE
DENMAN PROSPECT

FIG NO. 8-10

FIGURE TITLE Uriarra Ridge Investigation Area Scenario Two Heritage Information

PROJECT TITLE Western Edge Investigation Area - Scenario Two

N

0 0.5 1 Km

1:30,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

8.5 Bulgar Creek Investigation Area

The indicative development scenarios for the Bulgar Creek Investigation Area present slightly different outcomes, with the increase in potential conservation area being substituted by an expansion of potential developable area on the northern side of Cotter Road and south into the Kambah Investigation Area.

The tables below provide a comparison of scenarios two and three for the Bulgar Creek Investigation Area. Scenario Two provides a reasonable amount of future development area (1,341 ha) in a single largely consolidated area with good connectivity to existing suburbs in Weston Creek and with access via Cotter Road and Eucumbene Drive/Hindmarsh Drive. Key habitat connectivity corridors are shown as potentially being required along Bulgar Creek and between the Murrumbidgee River Reserve and potential conservation areas identified as containing remnant Box Gum Woodland. It is noted that land identified as Potential Future Development in areas of high heritage sensitivity, as identified in GML (2020) and the ACT Heritage Register (Figure 8-13), will require additional heritage assessment to confirm the suitability of these areas for development. Mapping showing sensitive Aboriginal places recorded on the ACT Heritage Register and GML (2020) is identified in the restricted Attachment A.

Table 8–8 | Overview of Bulgar Creek Scenario Two

Bulgar Creek - Scenario Two	Area (ha)	% Distribution
Total Investigation Area	1,758	-
Potential Future Development	1,342	76%
Potential Conservation Area	416	24%

Table 8–9 | Overview of Bulgar Creek Scenario Three

Bulgar Creek - Scenario Three	Area (ha)	% Distribution
Total Investigation Area	1,454	-
Potential Future Development	1,036	71%
Potential Conservation Area	416	29%

Figure 8-11 and Figure 8-12 provide the maps for Scenario Two and Three respectively. A more detailed breakdown of the percentage of the Central Molonglo Investigation Area that may have conservation values is provided in the following table.

Table 8–8 | Percentage of Bulgar Creek Investigation Area that may have conservation values

Scenarios	2	3	2	3	2	3	2	3
Assets	Potential – High Value Environmental Significance		Potential - White box - yellow box - Blakely's red gum grassy woodland and derived native grassland		Potential - Natural Temperate Grassland of the South Eastern Highlands		Potential – Pink-tailed worm-lizard	
Bulgar Creek (ha)	778	593	314	234	N/A	N/A	9	9

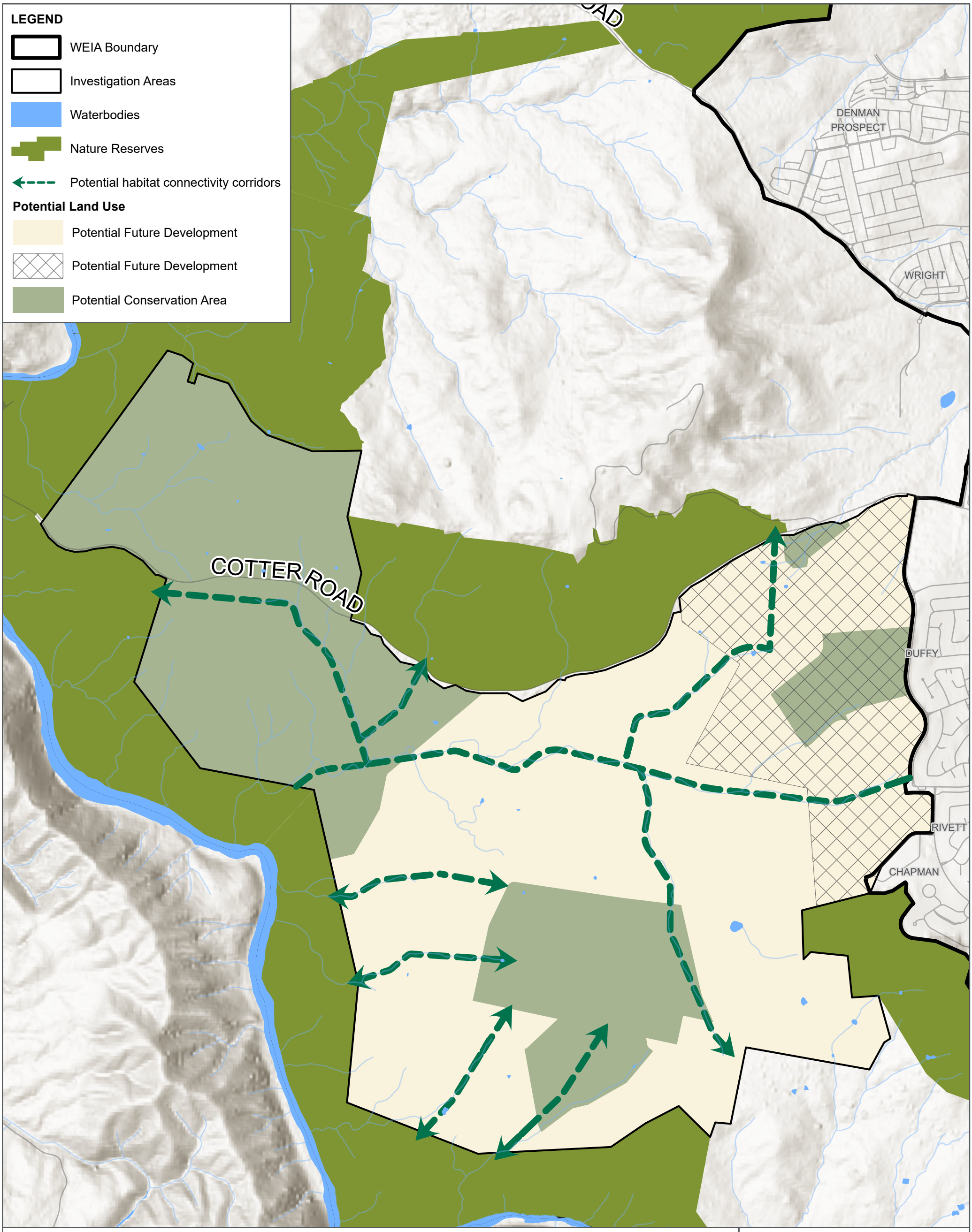


FIG NO. 8-11

FIGURE TITLE Bulgar Creek Investigation Area Scenario Two

PROJECT TITLE Western Edge Investigation Area - Scenario Two

N

0 0.5 1 Km

1:25,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

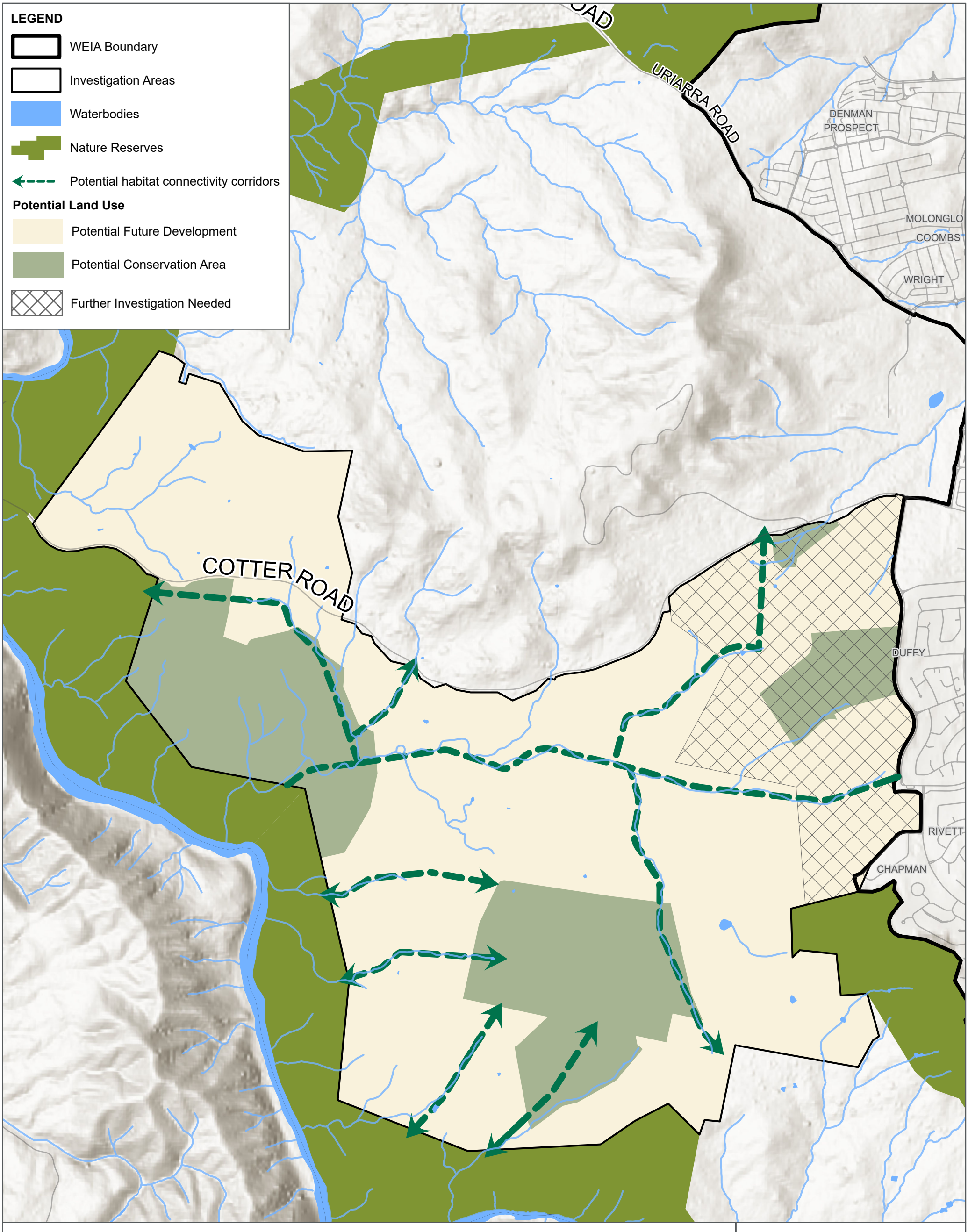


FIG NO. 8-12

FIGURE TITLE Bulgar Creek Investigation Area Scenario Three

PROJECT TITLE Western Edge Investigation Area - Scenario Three

N

0 0.5 1

Km

1:25,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS
Light Gray Base: Vicmap, Esri, HERE, Garmin, Foursquare, METI/NASA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

LEGEND

- WEIA Boundary
- Investigation Areas
- Waterbodies
- Nature Reserves
- Potential habitat connectivity corridors

Potential Land Use

- Potential Future Development
- Potential Future Development
- Potential Conservation Area

Registered heritage places and nominated Travelling Stock Route

- Casuarina Sands
- Cotter Pumping Station Precinct
- Greenhills Ruin
- Lower Molonglo Geological Site
- Travelling Stock Route
- Huntly

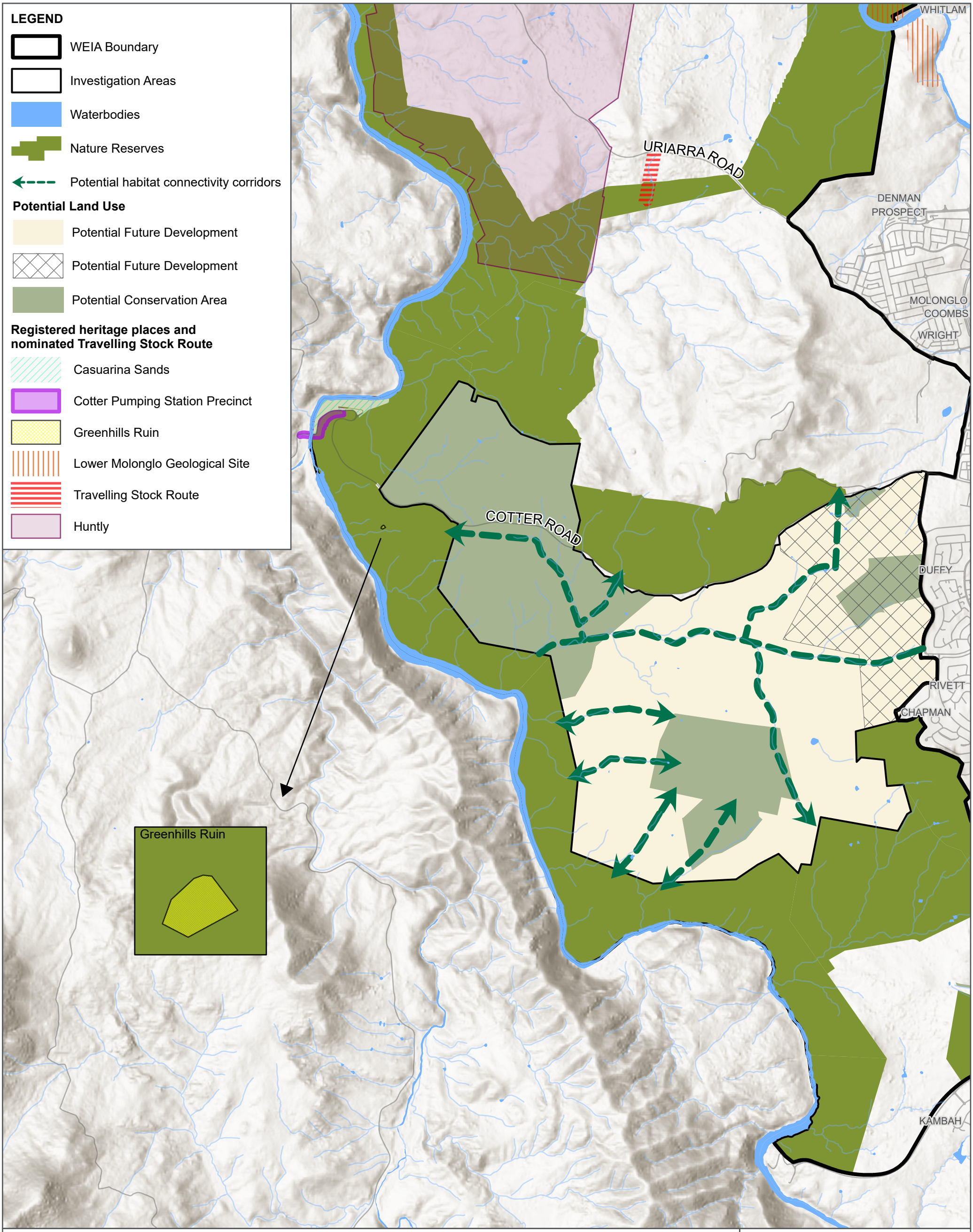


FIG NO. 8-13

FIGURE TITLE Bulgar Creek Investigation Area Scenario Two Heritage Information

PROJECT TITLE Western Edge Investigation Area - Scenario Two

N

0 0.5 1 2

Km

1:40,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

8.6 Kambah Investigation Area

The indicative development scenarios prepared for the Kambah Investigation Area present significantly different outcomes. As this investigation area is bounded to the north-east by Cooleman Ridge Nature Reserve and to the west by the Murrumbidgee River Reserve, access in and out of this investigation area is constrained. Access points to and from Kambah Pool Road connect to the south, however the connectivity into the Bulgar Creek Investigation Area is required to provide access north. This is a considerable constraint when considering building redundancy into the road network for traffic movements and emergency services. Ultimately this would impact staging and timing if development in this area were to be progressed.

Further targeted heritage survey of this area is required to confirm the presence of any significant places within the landscape. In addition, given that nature reserves adjoin the site to the north, south and west, additional ecological survey is recommended to confirm important habitat linkages and areas of habitat and vegetation that should be avoided. There are no areas of high heritage sensitivity identified in GML (2020) and the ACT Heritage Register for this area, however, additional heritage assessment to confirm the suitability of these areas for development will still be required. Mapping showing sensitive Aboriginal places recorded on the ACT Heritage Register and GML (2020) is identified in the restricted Attachment A.

Table 8–11 | Overview of Kambah Scenario Two

Kambah - Scenario Two	Area (ha)	% Distribution
Total Investigation Area	668	-
Potential Future Development	633	95%
Potential Conservation Area	23	3%

Table 8–12 | Overview of Kambah Scenario Three

Kambah - Scenario Three	Area (ha)	% Distribution
Total Investigation Area	668	-
Potential Future Development	645	97%
Potential Conservation Area	35	5%

Figure 8-14 and Figure 8-15 provide the maps for Scenario Two and Three respectively. A more detailed breakdown of the percentage of the Central Molonglo Investigation Area that may have conservation values is provided in the following table.

Table 8–13 | Percentage of Kambah Investigation Area that may have conservation values

Scenarios	2	3	2	3	2	3	2	3
Assets	Potential – High Value Environmental Significance		Potential - White box - yellow box - Blakely's red gum grassy woodland and derived native grassland		Potential - Natural Temperate Grassland of the South Eastern Highlands		Potential – Pink-tailed worm-lizard	
Bulgar Creek (ha)	241	241	97	97	N/A	N/A	N/A	N/A

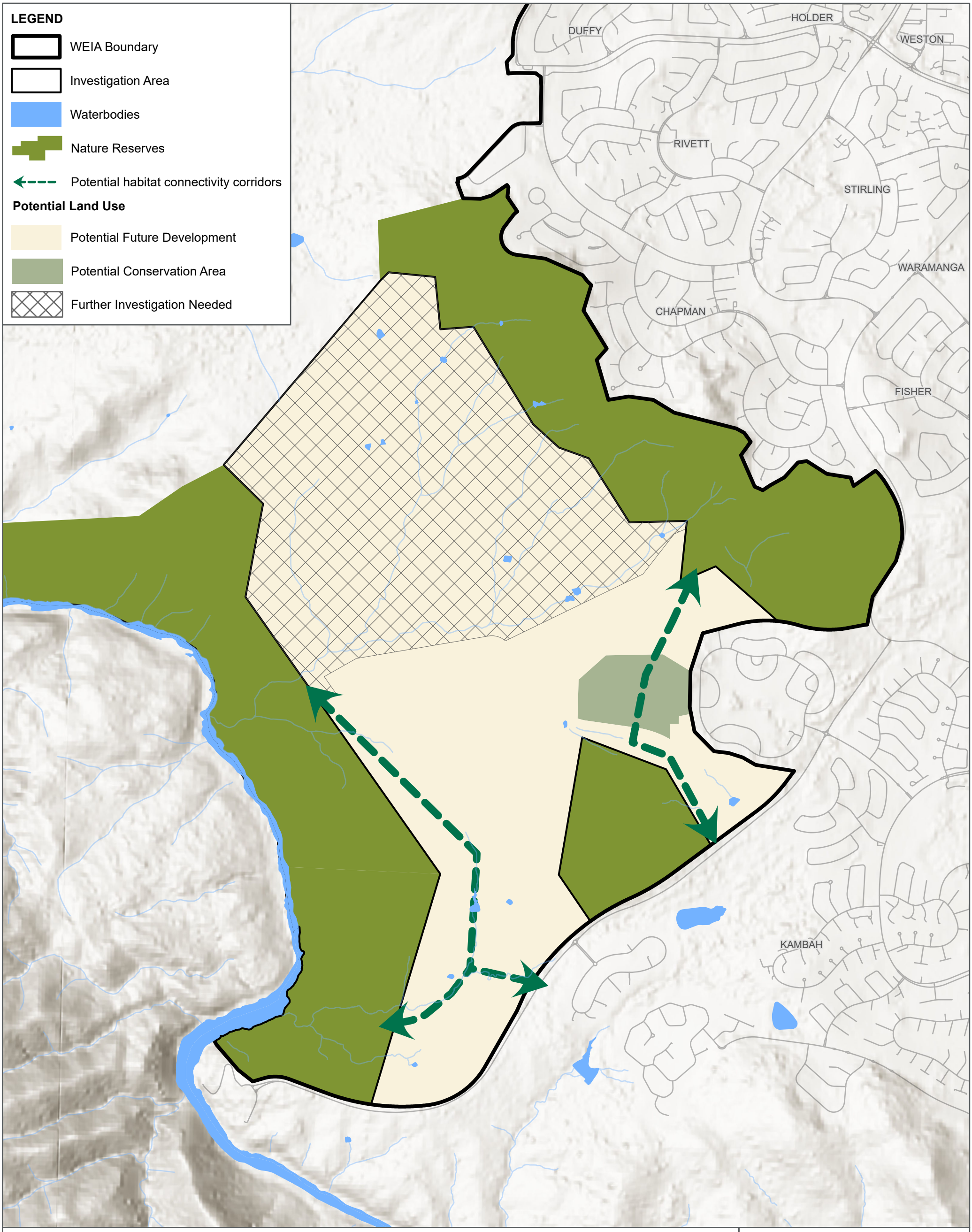


FIG NO. 8-14

FIGURE TITLE Kambah Investigation Area Scenario Two

PROJECT TITLE Western Edge Investigation Area - Scenario Two

N

0 0.5 1 Km

1:20,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

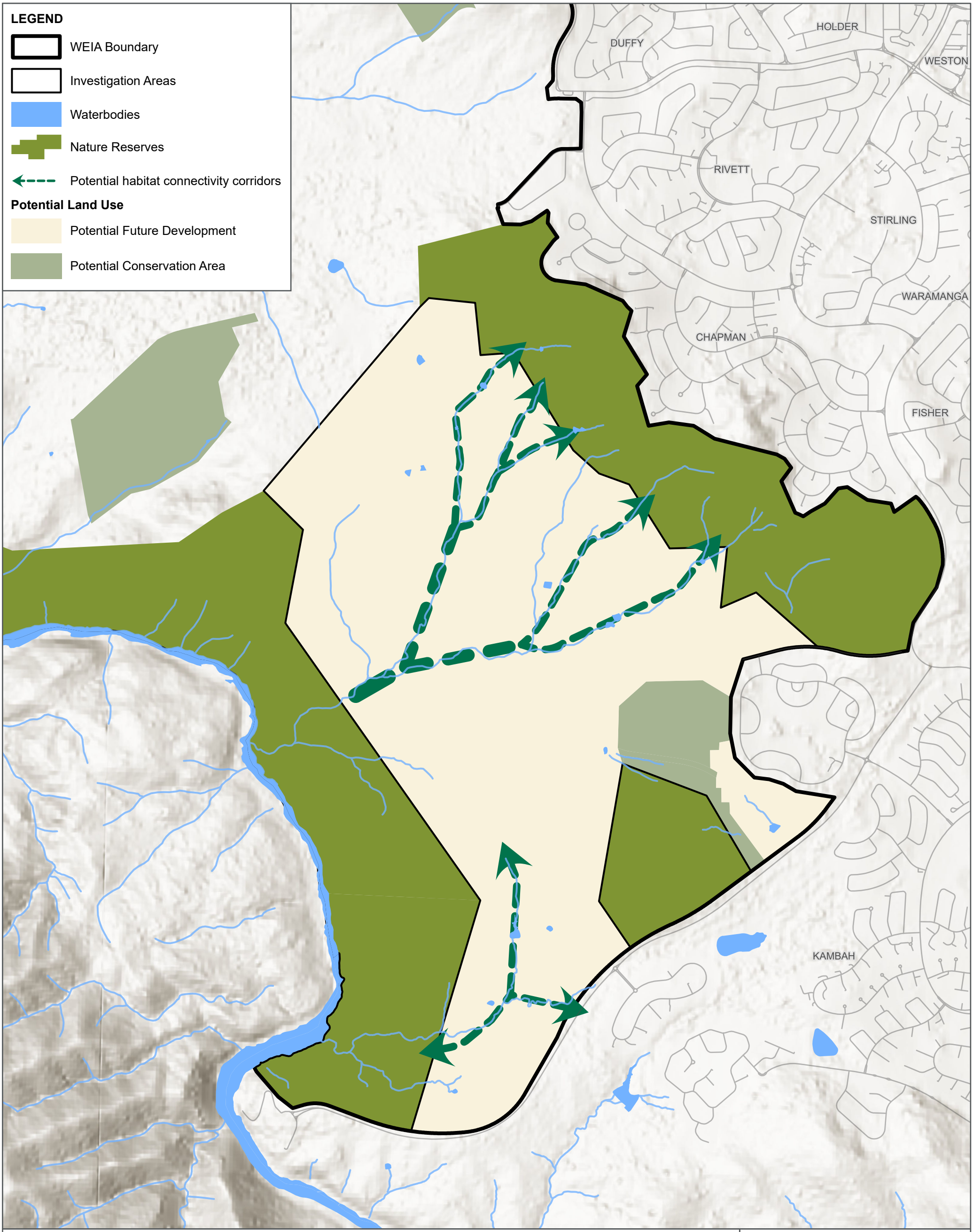


FIG NO.
8-15

FIGURE TITLE Kambah Investigation Area Scenario Three

PROJECT TITLE Western Edge Investigation Area - Scenario Three

N

0 0.5 1
Km

1:20,000

PAGE SIZE A3

SOURCES Base Layers: www.ACTmapi.act.gov.au ©Australian Capital Territory.
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS
Light Gray Base: Vicmap, Esri, HERE, Garmin, Foursquare, METI/NASA, USGS

COORDINATE SYSTEM
GDA2020 MGA Zone 55

SMEC
Member of the Surbana Jurong Group

9. Strategic Merit Test

To enable the comparison of urban development clusters and potential development scenarios, it was necessary to pass each scenario through a decision framework. The Australian Transport Assessment and Planning (ATAP) Guidelines provide a framework for planning, assessing and developing transport systems and related initiatives. Whilst this is not strictly a transport planning project, the use of a Strategic Merit Test is considered an appropriate method to analyse the indicative development scenarios that have been developed. It is intended that the outcome of the Strategic Merit Test would be used to prioritise further investigation into the feasibility of these areas for urban expansion.

9.1 Methodology

SMEC workshopped the indicative development scenarios prepared for the Central Molonglo, Bulgar Creek and Kambah Investigation Areas with the PCG at Workshop 4 on the 1 September 2022. A framework for comparative assessment was discussed, and together the project team and the PCG undertook a Strategic Merit Test. The Strategic Merit Test was run on the basis of the Scenario Two indicative development option, being the habitat connectivity driven outcome.

It is noted that the Uriarra Ridge Investigation Area was excluded from the scoring in the Strategic Merit Test. As discussed in Section 8.4, the Uriarra Ridge Investigation Area currently only has vehicular access via Uriarra Road and the topography of the area presents some infrastructure challenges, particularly for sewer. The area also contains the heritage listed Huntly rural property, and requires further consideration regarding the management of this known heritage attribute. Through the capability and suitability assessment it was determined that priority should first be given to development of other areas within the WEIA. While development of Uriarra Ridge may occur in the future, it is likely that this would be in the longer term, after release of other areas that are more readily serviceable and enjoy better connectivity to existing urban areas.

The workshop participants were asked to consider how each investigation area aligns with each of the design principles and agree on a scoring of High (3), Medium (2) or Low (1). The agreed ratings were then aggregated to confirm the overall score.

Table 9–1 | Strategic Merit Test

Criteria	Design Principle	Central Molonglo Investigation Area Rating	Bulgar Creek Investigation Area Rating	Kambah Investigation Area Rating
Size of urban cluster	To ensure urban capable area is sufficient in size to allow feasible development to occur	High	High	Low
Fragmentation	Cluster shape allows rational staging of development	High	High	Low
Orientation	Topography allows northerly orientation of streets for passive solar access Residential development is least suited to southerly sloping land, due to solar orientation.	Medium	High	Medium
Slope	Slopes are conducive to the land use vision of the cluster	High	High	Medium
Soils	Soil typologies are suited to the land use vision and do not result in expensive risks that must be managed in future developments.	High	Medium	Medium

Criteria	Design Principle	Central Molonglo Investigation Area Rating	Bulgar Creek Investigation Area Rating	Kambah Investigation Area Rating
Proximity to Urbanised Areas	Urban expansion is best undertaken where it is contiguous with existing suburbs to provide logical expansion of public transport and access to existing services (e.g. schools).	High	High	Medium
Adjoining Land Uses	Urban development is best suited where adjoining land uses do not present a conflict	Medium	Medium	Low
Movement Connectivity	Creates a highly connected place with good access to active and public transport and the existing (or planned) road network.	High	High	Low
Habitat Connectivity	Considers connectivity corridors between nature reserves and key areas of native vegetation.	High	High	High
Habitat	Urban development should avoid impacts on threatened ecological communities and protect key areas of habitat[2]	Medium	Medium	Low
Infrastructure Corridors / Servicing	Urban development is best suited to land that can be serviced by existing trunk infrastructure, or minor modifications to existing infrastructure	High	High	Medium
Visual Impacts	Urban intensification is best suited to landforms that can absorb visual impacts.	High	High	Medium
Emergency Egress	Urban development must provide appropriate emergency egress and multiple alternative exit points.	High	High	Low
Urban Heat Island	Climate responsive development should	High	High	High

[2] Rating based on Scenario two for each investigation area only. Scenario One all considered 'low'

Criteria	Design Principle	Central Molonglo Investigation Area Rating	Bulgar Creek Investigation Area Rating	Kambah Investigation Area Rating
	build-in mature canopy cover and blue-green infrastructure to mitigate urban heat island effect.			
Waterways	Urban development should incorporate opportunities for at-source treatment of urban stormwater and improvement of environmental outcomes in existing waterways.	High	High	Medium
Bushfire	Urban development should be sited to minimise bushfire risk	Medium	Medium	High
Totals		12 x High (3) = 36 4 x Medium (2) = 8 0 x Low (1) = 0	12 x High (3) = 36 4 x Medium (2) = 8 0 x Low (1) = 0	3 x High (3) = 9 7 x Medium (2) = 14 Low = 6
Score		**44 points**	**44 points**	**29 points**

The aggregated scores from the Strategic Merit Test rated Central Molonglo and Bulgar Creek Investigation Areas evenly at a total of 44 out of a possible score of 48. Kambah ranked considerably lower at 29. As a result, it is recommended that further investigation and master planning be prioritised for the Central Molonglo and Bulgar Creek investigation areas. Further recommendations are provided in the following section.

10. Recommendations

The approach taken in this project has collated and analysed existing data to determine the capability and suitability of land within the WEIA to accommodate future urban uses. This approach is useful in considering a range of variables, physical and environmental constraints and the risks surrounding the selection of suitable sites for future urban development.

By using GIS as a tool for a Multi-Criteria Analysis (MCA), we were able to form a decision matrix to efficiently and effectively guide the high level determination of urban suitable land within the WEIA. This approach to land use capability and suitability has provided:

- Greater confidence in decision making,
- Reduced risk in site suitability decisions, and
- Increased transparency in relation to decisions surrounding site selection for development.

While this approach has been useful in building an understanding of the development potential of the WEIA, it is noted that the assessment and analysis is high level and desktop only. It is intended that the work within this study be used as a benchmark for further studies and determination of urban development viability, alongside further targeted environmental, heritage, traffic, hydrology and infrastructure investigations are required as part of feasibility studies for each investigation area.

Noting the limitations of this high level analysis of urban capability and suitability, the following recommendations are made for consideration by the ACT Government in progressing master planning for the WEIA.

10.1 Climate Change and Resilience

The WEIA project presents an opportunity to promote best practice sustainability targets and to build community climate change resilience through climate sensitive urban design, water cycle management, green and living infrastructure and habitat connectivity.

Through a review of available climate data for the ACT, it is expected that Canberra will continue to warm in the near future. Increased urbanisation will also contribute to the urban heat island effect and increased stormwater runoff from more intense rainfall events. The frequency and intensity of bushfire events is also expected to increase. It is expected that climate change will also adversely impact sensitive threatened ecological communities, through changes to habitats and reduced biodiversity.

Urban heat will be increased in areas with large expanses of commercial, industrial and residential areas where there is a lack of vegetation. A review of climate change modelling, undertaken in collaboration with the NSW and ACT governments in an initiative known as the NSW and Australian Regional Climate Modelling project (NARCliM), shows that in the near future (2020-39) the ACT is expected to experience an additional +1.8 hot days over 35°c and a decline of 2.8% in annual rainfall. A summary of these projections is shown in Table 10–1.

Table 10–1| Summary of climate change impacts to the ACT (NSW and Australian Regional Climate Modelling)

Climate Projection	Near Future (2020-39)	Far Future (2060-79)
Change in Temperature (Mean)	+0.66°c	+2.04°c
Changes in rainfall (Annual)	-2.8%	-0.4%
Cold nights under 2°c (Annual)	-13.1	-42.5
High fire danger days (Annual)	+0.1	+0.3
Hot days over 35°c (Annual)	+1.8	+6.2

The existing NARCliM modelling provides a downscaled dataset for climate projections within the ACT, however there is a need to further contextualise climate impacts for future communities such as the WEIA. Further investigations should be undertaken to develop precinct scale mapping of the WEIA showing the impacts of higher intensity rain and flooding events on future communities. This could be undertaken as a GIS exercise and incorporated into the capability assessment at a later stage.

An understanding of climate change impacts is critical to ensuring liveability, achieving sustainability objectives, undertaking nature-led development and future proofing of the WEIA and has been viewed as a key driver to the way that the development of the WEIA could be sensitively undertaken. It is recognised that the climate change is likely to result in changes to the distribution and composition of species as well as ecosystems due to changed weather patterns and increased fire weather and storm events.

To ensure both future development and biodiversity of the WEIA is resilient to climate change, future urban areas should be connected by living infrastructure and habitat corridors which would provide both urban cooling and habitat for sensitive species. Future plantings in urban areas should be undertaken using climate resilient species identified in the ACT climate-wise landscape guide and would provide additional habitat connectivity for species. Such matters should be considered in the future stages of master planning for the WEIA.

The inclusion of water sensitive urban design infrastructure would also provide an appropriate option for the management and treatment of stormwater as a result of higher intensity rainfall and prior to discharge into local water courses. Consideration of appropriate planning and development controls, building typologies, and the inclusion of asset protection zones and hazard management areas should be considered given the expected increase to bushfire frequency and severity.

10.2 Cultural and European Heritage

As discussed throughout this assessment, quantifying the presence of heritage values in the WEIA is somewhat difficult due to the level of heritage assessment undertaken to date. The GML (2020) Cultural Heritage Assessment suggested mapping of heritage values in the WEIA including, areas of high sensitivity considered unsuitable for future development; areas of moderate sensitivity which are considered possible for future development; and areas that require further investigation to determine sensitivity. GML (2020) also mapped some registered heritage places, and identified cultural areas, Aboriginal places, including site complexes, and noted intangible values associated with areas of the WEIA.

It is noted that indicative development scenarios presented in SMEC (2022) show these areas as Investigation Areas, and include registered heritage places, Aboriginal places and cultural areas for Potential Development. This approach avoids total exclusion of development in these areas subject to further detailed assessments to establish heritage values and appropriate management approaches. It is acknowledged that these areas may not be suitable for future development and limited consideration of heritage has been applied in Scenario mapping, leading to some areas not currently viable for development to be mapped as potential development areas. Further heritage investigation is recommended at an early stage to consider the development potential of each Investigation Area noting that this will likely result in changes to areas identified for potential development, including significant alterations to mapping of land which is suitable and capable for development.

In addition, managing intangible cultural heritage values such as spiritual places and song lines, is considered important and difficult to quantify at this stage of the project based on the cultural heritage assessments completed to date. Furthermore, heritage surveys over the project area have been limited in scale, and in many instances, not systematic. More Aboriginal places are recorded in areas where survey has previously occurred, compared to areas which have not been surveyed. This would build an unfair bias into any quantitative GIS assessment, as has been undertaken for other variables in the suitability and capability assessment. The recognition of Aboriginal people as the first designers and first planners of the country is an important lens for the future development of the WEIA, and it is recommended that further consultation and engagement with local Aboriginal communities be undertaken to develop a deeper understanding of the previous use of the landscape and how a Designing for Country approach can be taken in the future development of the area.

Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in Appendix A and Attachment A, respectively.

It is noted that the ACT Government has commenced an Aboriginal Cultural Values Assessment with the intent of undertaking early engagement with Aboriginal Knowledge Holders on the cultural values of the WEIA, to inform heritage conservation and management outcomes for the future feasibility stages of the project. The findings of this Cultural Values Assessment will likely affect land which is currently mapped as suitable for development.

Consistent with the ACT Heritage Council's Cultural Heritage Reporting Policy (2015), future investigations should also include Cultural Heritage Assessments (CHAs) developed with Representative Aboriginal Organisations to ensure that adequate avoidance and mitigation measures can be considered in the initial planning processes. CHAs are required prior to any formal development approval processes and should be completed at an early stage to allow appropriate management and conservation of Aboriginal places and values. Statutory approvals under the Section 61H of the Heritage Act 2004 will also be required for any works that may diminish the significance of registered heritage places or may damage Aboriginal places and/or objects. Where statutory approvals are sought to damage or diminish the significance, it must be demonstrated to the Council's satisfaction that the proposed activity is justifiable, that there are no reasonably practicable alternatives and that reasonable steps have been identified to reduce the risk of heritage effects.

10.3 Urban Habitat

Noting the ecological importance of the WEIA, particularly in providing connectivity between existing established nature reserves, it is recommended that further ecological studies be undertaken to support more detailed feasibility studies and master planning for the investigation areas. These studies should recommend the location, widths and ecological attributes that should be retained to preserve important connectivity routes across the landscape. It is likely that this work would require additional targeted species services in order to ascertain movement patterns, appropriate buffer areas and areas that should be avoided.

Where impacts cannot be avoided, mitigation through offsetting may be appropriate. Offsetting should be considered at a regional scale, through the preparation of a Strategic Assessment under Part 10 of the Commonwealth *Environmental Protection and Biodiversity Conservation Act* 1999. A Strategic Assessment, including offsetting strategy was prepared in the Molonglo Valley Plan for the Protection of Matters of National Environmental Significance (NES Plan) 2011. This would ensure habitat conservation is prioritised, whilst also allowing development to occur in appropriate areas.

SMEC

Level 9, 12 Moore St.
Canberra ACT 2601

PO Box 1043, Dickson ACT 2602

Phone: 02 6234 1900

Email: canberra@smec.com

We're redefining exceptional

Through our specialist expertise, we're challenging boundaries to deliver advanced infrastructure solutions.

www.smec.com

Attachment A – Sensitive Heritage Information