Development Plan Amendment

By the Council

City of Charles Sturt

Kilkenny Mixed Use (Residential and Commercial) Draft DPA (Privately Funded)

Explanatory Statement and Analysis

For Consultation
January 2020

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Have Your Say

This Development Plan Amendment (DPA) will be available for inspection by the public at the City of Charles Sturt Civic Centre, 72 Woodville Road, Woodville, from Thursday 6 February 2020 until 5pm Tuesday 14 April 2020.

During this time anyone may make a written submission about any changes the DPA is proposing.

Submissions should be sent to the Chief Executive Officer, City of Charles Sturt, PO Box 1, Woodville SA 5011.

Submissions should indicate whether the author wishes to speak at a public meeting about the DPA. If no-one requests to be heard, no public meeting will be held.

If requested, a meeting will be held at 6pm on Monday 18 May 2020 at the Civic Centre, 72 Woodville Road, Woodville.

Planning and Design Code

A new planning system is currently being introduced into South Australia. The new Planning, Development and Infrastructure Act 2016 (PDI Act) is being introduced in stages. The Planning and Design Code is the cornerstone of the new planning system and consolidates the planning rules contained in South Australia's 72 Development Plans into one rulebook. In this regard the Charles Sturt Council Development Plan will be superseded by the new Planning and Design Code in July 2020.

We are currently in the transition between the two pieces of legislation. This DPA, being undertaken by Council, is being prepared and consulted on under the Development Act 1993 to amend Council's current Development Plan.

Existing zones in the current Development Plan will be transitioned to the equivalent zone in the Planning and Design Code. In regard to the policy changes proposed in this DPA, all changes utilise existing zones within the current Development Plan with some local additions. If the DPA is approved by the Minister for Planning, the intent of the policy changes will be transitioned, with the relevant zones in the current plan. Potentially local additions will be transitioned into a subzone.

It should be noted that Phase 3 of the Planning and Design Code is currently on consultation under the PDI Act. At this stage the changes proposed in this DPA are not incorporated into the draft Code. As indicated above, if the DPA is approved, these will be transitioned into the Code.

Refer to the SA Planning Portal at saplanningportal.sa.gov.au for more information.

Explanatory Statement

Introduction

The *Development Act 1993* provides the legislative framework for undertaking amendments to a Development Plan. The *Development Act 1993* allows either the relevant council or, under prescribed circumstances, the Minister responsible for the administration of the *Development Act 1993 (*the Minister*),* to amend a Development Plan.

Before amending a Development Plan, a council must first reach agreement with the Minister regarding the range of issues the amendment will address. This is called a Statement of Intent. Once the Statement of Intent is agreed to, a Development Plan Amendment (DPA) (this document) is written, which explains what policy changes are being proposed and why, and how the amendment process will be conducted.

A DPA may include:

- An Explanatory Statement (this section)
- Analysis, which may include:
  - Background information
  - Investigations
  - Recommended policy changes
  - Statement of statutory compliance
- References/Bibliography
- Certification by Council's Chief Executive Officer
- Appendices
- The Amendment.

Need for the amendment

The Affected Area comprises an area of approximately 3.3 hectares, the majority of which is under the ownership of Gregsand Pty Ltd and Arkaba Pty Ltd. The majority of the land is located within the Urban Employment Zone with a small section of the subject land being within the Residential Character Zone.

The Affected Area comprises mainly large-scale industrial buildings and bitumen. The major industrial presence in this location in the past has been the former Bianco operations (located south of Pinda Street and east of Wilpena Terrace) which ceased operations around 10 years ago. The land is located adjacent to the Kilkenny Railway Station and MJ McInerney Reserve (a large area of public open space).

The *30-Year Plan for Greater Adelaide* (30-Year Plan), (2017 update) details the Government's aim to contain the urban footprint by increasing densities in appropriate areas such as 'Mass Transit Routes'. The 30–Year Plan aims to achieve population growth by developing new residential areas in greenfield locations and increasing infill development in established areas.

The City of Charles Sturt will accommodate a portion of the increased population growth, predominantly through achieving greater densities in major infill developments (e.g. Bowden Village, Woodville West, St Clair), and other infill developments around centres and adjacent to transit corridors and along key transit corridors (roads and rail). The Affected Area for this DPA qualifies as a site that has major infill development potential in close proximity to existing services and the CBD.

Council's Industrial Land Study (2008) recommended that the Bianco site (proposed DPA investigation area) and the John Shearer site (south of the railway line) "*were ripe for redevelopment*". The Study also recognised that the industrial land in this location was problematic with poor access arrangements north of the railway line and recommended rezoning the "*old and largely run-down precinct north of the railway line for high density residential use",* while recognising the need to address interface issues with the neighbouring existing glass factory to protect its ongoing operations.

The City of Charles Sturt Strategic Directions Report (SDR) (2014) identified as a low priority to investigate options for the future use of the precinct for mixed use with an employment focus. The recommended

investigations within the SDR sought to ensure no adverse impacts on the ongoing operations of the OI glass manufacturing facility and to address interface issues with other adjacent residential areas.

The proponent is seeking to achieve a better use of the site and develop it to its full potential and as such has offered to fund this DPA. Council agreed to prepare the DPA in accordance with its Privately Funded Development Plan Amendment Policy.

The DPA proposes to amend the zoning to facilitate medium to higher density residential land uses and commercial opportunities to make better use of the site's location in close proximity to the existing Kilkenny Railway Station, public open space and the Adelaide CBD.

Statement of Intent

The Statement of Intent relating to this DPA was agreed to by the Minister on 17th October 2018.

The issues and investigations agreed to in the Statement of Intent have been undertaken or addressed.

Affected area

The area(s) affected by the proposed DPA is identified below:

Summary of proposed policy changes

The DPA proposes the following changes:

- Rezone the affected area from the Urban Employment Zone (and two Residential Character Zone properties) to the Suburban Activity Node Zone
- Provide additional policy amendments within the Suburban Activity Node Zone which addresses:
  - Identification of Core and Transition area locations specific to Kilkenny
  - Confirmation of desired maximum building heights of 5 storeys within the core area and 3 storeys within the transition areas
  - Limiting building heights to 2 storeys within 9.5 metres of the Mundulla Street frontage (to respond to historic character interface)
  - Limiting non-residential development from Mundulla Street frontage
  - Identifying and differentiating maximum retail floor areas for the transition area from those applying to Seaton (already contained within the Suburban Activity Node Zone)
  - Identification of desired activated frontages along David Terrace and Wilpena Terrace
  - Identification of the O-I Glass plant, rail line and David Terrace as key noise sources from which residential development needs to mitigate impacts
  - Identification of the presence of the Historic Conservation Area and local heritage place within the zone and the need for development to respond to these
  - Provision of a public plaza adjacent the rail station
  - Provision of pedestrian connections to Arkaba Road and MJ McInerney Reserve
  - Ensuring development makes space for the Outer Harbor Greenway along the rail corridor.
- Application of the Noise and Air Emissions Overlay to the affected area
- Application of the Affordable Housing Overlay to the affected area
- Mapping amendments to reflect the zoning and Overlay application changes.

Legal requirements

Prior to the preparation of this DPA, council received advice from a person or persons holding prescribed qualifications pursuant to section 25(4) of the *Development Act 1993*.

The DPA has assessed the extent to which the proposed amendment:
- accords with the Planning Strategy
- accords with the Statement of Intent
- accords with other parts of council's Development Plan
- complements the policies in Development Plans for adjoining areas
- accords with relevant infrastructure planning
- satisfies the requirements prescribed by the *Development Regulations 2008*.

Consultation

This DPA is now released for formal agency and public consultation. The following government agencies and organisations are to be formally consulted:

- Department of Planning, Transport and Infrastructure – Strategic and Development Planning
- Department of Planning, Transport and Infrastructure – Transport Services
- Department of Planning, Transport and Infrastructure – Public Transport Division
- Department of Environment and Water

- Department for Trade, Tourism and Investment
- Department for Education
- Environment Protection Authority
- State Emergency Services
- SA Metropolitan Fire Service
- Electranet Pty Ltd
- Epic Energy
- SA Power Networks
- APA Group
- SA Water
- Peter Malinauskas MP (Member for Croydon)
- Joe Szakacs MP (Member for Cheltenham)
- Hon Mark Butler MP (Federal Member for Hindmarsh)
- Hon Steve Georganas MP (Federal Member for Adelaide)
- Land owners within and adjacent to the investigation area
- City of West Torrens
- City of Prospect
- City of Port Adelaide and Enfield
- City of Adelaide

All written and verbal, agency and public submissions made during the consultation phase will be recorded, considered, summarised and responses provided. Subsequent changes to the DPA may occur as a result of this consultation process.

In the preparation of the investigations, engagement has already occurred with the following key stakeholders:

- Department of Planning, Transport and Infrastructure – Development Services
- Department of Planning, Transport and Infrastructure – Transport Services
- Department of Planning, Transport and Infrastructure – Public Transport Division
- Environment Protection Authority
- Electranet Pty Ltd
- Epic Energy
- SA Power Networks
- APA Group
- SA Water
- O-I Glass

Important Note for Agencies: This DPA includes modules from the State Planning Policy Library.

As the policy library was subject to agency consultation during its development, agencies are requested to comment only on the range and application of the modules selected and not on the actual policy content, except where that policy has been included as a local addition. Agencies are invited to comment on any additional issues (if relevant).

The final stage

When the council has considered the comments received and made any appropriate changes, a report on this (the *Summary of consultations and proposed amendments* report) will be sent to the Minister.

The Minister will then either approve (with or without changes) or refuse the DPA.

Analysis

1. Background

The Affected Area primarily comprises of large-scale industrial buildings, the largest of which is the former Bianco site, which has been disused for approximately 10 years. The majority of the land is under the ownership of Gregsand Pty Ltd and Arkaba Pty Ltd. The land is located in close proximity to major traffic corridors, public transport routes and stations, public open space, and long-standing residential neighbourhoods.

Currently, the land is predominately within the Urban Employment Zone, except for two allotments on the northern boundary of the Affected Area which are sited within the Residential Character Zone. The proximity of the land to established residential areas to the north and the adjacent MJ McInerney Reserve, along with access difficulties have prejudiced the expansion and intensification of industrial uses within the Affected Area.

The Affected Area has long been earmarked for future redevelopment by the land owner and is considered underutilised in its present form. The land is in a strategic location and has significant potential for higher density residential development and commercial uses which better respond to its setting and proximity to transport infrastructure.

Council's Industrial Land Study (2008) examined the value of the affected area for industrial purposes. The study recommended that the Bianco site (proposed DPA investigation area) and the John Shearer site (south of the railway line) "*were ripe for redevelopment*". The Study also recognised that the industrial land in this location was problematic with poor access arrangements north of the railway line and recommended rezoning the "*old and largely run-down precinct north of the railway line for high density residential use",* while recognising the need to address interface issues with the neighbouring existing glass factory to protect its ongoing operations.

In response to the recommendations of the Industrial Land Study, Council prepared a Transit Oriented Development Scoping Study for two locations, being Seaton and Kilkenny (the affected area). The study explored opportunities for the site to establish mixed use development, particularly additional high-density housing which would aid in achieving the targets in place for Charles Sturt in the 30 Year Plan for Greater Adelaide. The study also explored desirable built form and structural arrangements across the site, forming the basis for consideration of rezoning options. Council's Strategic Directions Report recommended a DPA to rezone the affected area, however this was identified as being a low priority for Council at the time (unless undertaken as a privately funded DPA).

Following a request by the proponent, Council agreed to prepare the DPA in accordance with its Privately Funded Development Plan Amendment Policy. The DPA is informed by a series of investigations initiated and funded by the proponent, however is reviewed and managed by Council.

The purpose of the proposed DPA , building on this earlier work, is to review the policies and zoning of the Affected Area and to establish a policy framework which will facilitate mixed use development, comprising of medium to high density residential and commercial development within the Affected Area. It will also address a number of constraints facing the site, including the management of the interface with adjacent industrial land uses, management of traffic and the integration with the adjacent residential neighbourhoods, which includes a Historic Conservation Area.

2. The strategic context and policy directions

2.1 Consistency with South Australia's Strategic Plan

South Australia's Strategic Plan outlines a medium to long-term vision for the whole of South Australia. It provides a framework for the activities of the South Australian Government, business and the entire South Australian community with targets guiding policy and investment decisions.

The DPA is consistent with the objectives, and aids in the achievement of targets within the Strategic Plan associated with:

- Increased population growth
- Provision of affordable housing
- Provision of key social and economic infrastructure
- Urban growth being mostly accommodated within established urban areas

The DPA seeks to facilitate additional housing which supports additional population growth within this location. In addition, the DPA seeks to utilise underutilised, compromised industrial land within the established urban area with excellent public transport access to provide additional housing choices at increased densities. This will be supported by the accommodation of commercial development that would service the local community. The DPA aims to also accommodate policy support which will provide for affordable housing outcomes, supported by the increased density and alternative housing forms.

Importantly, the DPA examines the infrastructure needs of any future development and seeks to ensure that this is appropriately planned for and its delivery programmed, including any agreements required to support this.

2.2 Consistency with the Planning Strategy

The Planning Strategy presents current State Government planning policy for development in South Australia. In particular, it seeks to guide and coordinate State Government activity in the construction and provision of services and infrastructure that influence the development of South Australia. It also indicates directions for future development to the community, the private sector and local government.

The following volumes of the Planning Strategy are relevant to this DPA:

- The 30-Year Plan for Greater Adelaide (2017 Update)

The DPA addresses the following relevant targets within the Planning Strategy:

- **Target 1 -** 85% of all new housing in metropolitan Adelaide built in established urban areas by 2045
- **Target 2 -** 60% of all new housing in metropolitan Adelaide is built within close proximity to current and proposed fixed line (rail/ tram/ O-Bahn) and high frequency bus routes by 2045
- **Target 4 -** Increase the percentage of residents living in walkable neighbourhoods in Inner, Middle and Outer Metropolitan Adelaide by 25% by 2045
- **Target 5 -** Urban green cover is increased by 20% in metropolitan Adelaide by 2045
- **Target 6 -** Increasing housing choice by 25% to meet changing household needs in Greater Adelaide by 2045

The DPA contributes to the achievement of the targets by seeking to rezone and better utilise land within a strategic location in an identified growth corridor within the established urban area of Adelaide. In doing so, it will facilitate the creation of additional diverse housing options, along with mixed use development that provides for local needs and services within a walkable community, and with excellent public transport to the City Centre and Port Adelaide.

This DPA is consistent with the principles within the 30 Year Plan, along with policies within the planning strategy relating to:

- transit corridors, growth areas and activity centres
- design quality
- housing mix and affordability
- the economy and jobs
- transport
- open space and recreation
- climate change
- water
- emergency management and hazard avoidance.

A detailed assessment of the 30 Year Plan for Greater Adelaide is contained within Appendix A

2.3 Consistency with other key strategic policy documents

2.3.1 Council's Strategic Directions (Section 30) Report (2014)

The City of Charles Sturt Strategic Directions Report (SDR) (2014) identified as a low priority to investigate options for the future use of the precinct for mixed use with an employment focus. The recommended investigations within the SDR sought to ensure no adverse impacts on the ongoing operations of the OI glass manufacturing facility and to address interface issues with other adjacent residential areas.

The DPA directly addresses the issues raised within the SDR.

2.3.2 City of Charles Sturt Community Plan 2016 – 2027

The DPA supports the following policies of the City's Community plan by:

City of Charles Sturt Community Plan 2013 - 2027	
Theme/Objective	**Comment**
Our Liveability: ***An Urban environment that is adaptive to a changing and growing city***	The draft DPA proposes to investigate the rezoning of an area of land that is located within the Urban Employment Zone which was identified through previous studies as an opportunity for re-zoning to take advantage of its location in close proximity to an existing public transport system and services.
Drive an integrated, responsive transport system and network.	The draft DPA proposes to investigate the introduction of policy to encourage residential uses of a higher density located adjacent to existing public transport routes and the Outer Harbor Greenway.
Enhance the quality and diversity of open and public spaces.	Provision of public open space will be investigated including appropriate size and location to ensure visibility and accessibility to the broader locality. The draft DPA will also investigate policy opportunities to encourage activation within the Affected Area to take advantage of its accessibility with the Outer Harbor Greenway.
Our Economy: ***Facilitate an environment for a diversity of business and industry types***	The DPA proposes to investigate the inclusion of policy that can encourage mix-use development including commercial land uses to service the proposed residential uses and provide potential employment opportunities.

2.3.3 Infrastructure Planning

Where relevant, a DPA must take into account relevant infrastructure planning (both physical and social infrastructure) as identified by Council (usually through the Strategic Directions Report), the Minister and/or other government agencies.

The following infrastructure planning is of relevance to this DPA:

Council Infrastructure Planning	Response/Comment
Nil	Nil

Government Agency Infrastructure Planning	Response/Comment
Nil	Nil

2.3.4 Current Ministerial and Council DPAs

This DPA has taken into account the following Ministerial and Council DPAs which are currently being processed:

Council DPAs	Response/Comment
Woodville Road and Environs DPA (under preparation)	This DPA is specific to this location and seeks to review the zoning along the Woodville Road corridor to better facilitate mixed use development reflective of the masterplan previously prepared for this location. Given this, the DPA will not be affected by this DPA.
Grange Road, Findon DPA (Privately Funded)	This DPA Seeks to extend the existing Neighbourhood Centre Zone at Findon east to facilitate the establishment of an Aldi supermarket and additional bulky goods tenancies. The DPA is specific to that location and zone and will not affect this DPA.
Findon Road, Kidman Park (North) Mixed Use (Residential and Commercial) DPA (Privately Funded)	This DPA investigates policy amendments to allow higher density residential and some commercial development to make better use of the site's location in close proximity to public transport and the Adelaide CBD. The DPA is under preparation and is yet to be released for consultation. It is specific to the DPA location and direction on the preferred zone format is not yet resolved, although the use of the Suburban Activity Node Zone would need to have regard to the amendments proposed within this DPA.

Ministerial DPAs	Response/Comment
There are no current Ministerial DPAs that will be affected by this DPA.	

2.3.4 Existing Ministerial Policy

The DPA does not seek to amend any Ministerial policy.

2.3.5 Consideration of the Transition to the Planning and Design Code

The Planning and Design Code will be a central feature of South Australia's new planning system, becoming the state's single planning rulebook for assessing all development applications and replacing the 72 Development Plans and SAPPL. It will provide a consistent and contemporary planning policy framework across the state.

The SAPPL will be used as a base for the amendments, however, how policy for the affected area will sit within the future Planning and Design Code framework will also be considered. Use of Core SAPPL policy as much as possible will ensure appropriate transition of policy introduced as part of this DPA in this location into the new Code. In addition, when considering specific policy amendments in this DPA:

- Concept Plans will not be used and instead reflected in principles of development control
- Reliance on the use of the Desired Character Statement will not be used, rather coverage provided for in principles of development control

3. Investigations

3.1 Investigations undertaken prior to the SOI

Prior to the preparation of the Statement of Intent (SOI) in relation to this DPA, the following investigations were undertaken and inform this DPA:

3.1.1 Industrial Land Study (2008)

This study considered the industrial land stock within the City of Charles Sturt by identifying existing industrial land supply and assessing its value in continuing with its current industrial use, or undergoing re-zoning in order to potentially consider alternative land uses.

‘Prime Industrial Area’s’ (PIA’s) are defined by the study against 11 criteria which inform whether the land has rezoning potential. The Kilkenny industrial precinct formed one of the separate 22 Industrial Precincts assessed.

The analysis suggested that 9 of the 22 precincts are PIA’s, and warrant protection and enhancement in their industrial function, whilst a handful have high rezoning potential. Importantly, the portion of the Kilkenny Precinct north of the rail line (ie the affected area) is identified for rezoning whilst the remainder of the existing precinct south of the rail line is identified for retention for Urban Employment purposes.

Importantly, the study recognises that buffering and interface between these areas will be an important consideration in any rezoning, and that high-density residential use should be considered for the Bianco site north of the rail line to take advantage of its proximity to this infrastructure.

3.1.2 The Kilkenny and Seaton Park Transit Oriented Development Scoping Study (2009)

This study was undertaken to investigate the potential for transit-oriented development (TOD) to occur in and around the Seaton and Kilkenny area in response to the Industrial Land Study. The study developed strategic redevelopment options for two identified sites with consideration of specific site opportunities and constraints.

The two industrial sites considered are the former Bianco site in Kilkenny (Affected Area) and the former Balfours site in Seaton. The former Balfours site was subsequently re-zoned in 2017 for mixed-use (commercial and residential).

The scoping study envisaged a TOD scenario for the Kilkenny precinct which would:

- be an innovative example of a sustainable and vibrant mixed-use urban village
- host residential and next-generation commercial and industrial activities in unity
- result in a higher density urban form of up to 5 storeys in height

- include high value public realm and public greenspace (including public plazas and green streets)
- manage the transition and interface with the adjacent Historic Conservation Area
- facilitate a new employment hub of green and advanced technology businesses

Implications for Policy

The Study points to a need for the new zoning to accommodate a mixture of uses, as well as allow for a more compact, and intense building form representative of a transit-oriented type development. It is noted that a Suburban Activity Node Zone has been adopted for the Seaton area.

The Study also provides guidance on the appropriate building heights envisaged for this location being up to 5 storeys, with transitions to the adjacent Historic Conservation Area which should be reflected within the policy. This is discussed in more detail within Section 3.2.1.

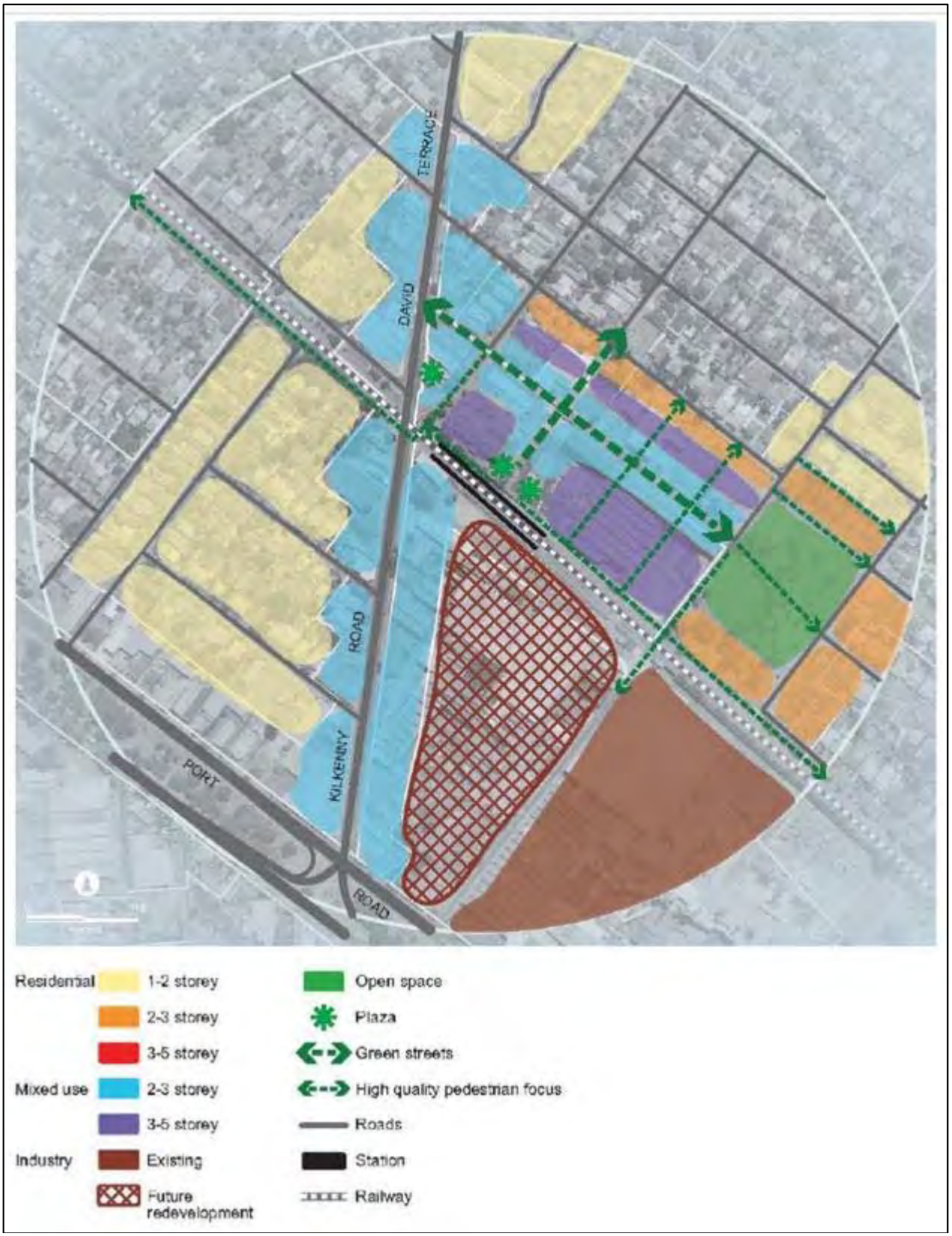


Figure 1: Transit Oriented Development Structure Plan for the Kilkenny area.

3.1.3 AEC Environmental Site Assessment (2004) & Update on Bianco Site Condition (2015)

Adelaide Environmental Consulting (AEC) undertook an Environmental Site Assessment for the Bianco Site, which comprises the land south of Pinda Street and east of Wilpena Terrace within the Affected Area. It is noted that the investigations did not extend to the other industrial land parcels within the Affected Area although the potential for contaminating activities is considered to be consistent with that of the former Bianco site (although potentially of less intensity).

The initial Environmental Site Assessment was undertaken in 2004 as part of due diligence investigations prior to the sale of the land. The site was identified to have accommodated previous potentially contaminating activities, such as:

- Blacksmith and foundries during the 1800s & 1900s
- Pre-cast concrete production since 1996 (discontinued in 2011)
- The specific potentially contaminating activities of note include:
    - Site levelling and the filling of various pits with foundry sand;
    - Disposal of slag and coke residues from foundry operations;
    - Fuel and acid leakage from underground storage tanks;
    - Leakage of polychlorinated biphenyls (PCB's) from the electrical substation area;
    - Cyanide from past foundry activities;
    - Potential residue from termite control applications beneath buildings.

Contaminants of concern from the above activities include heavy metals, organochlorine pesticides, polycyclic aromatic hydrocarbons, cyanide, total petroleum hydrocarbons, BTEX and polychlorinated biphenyls.

The investigation comprised of a site inspection as well as sampling (16 boreholes and three groundwater wells) and analysis of soil and groundwater underlying the site.

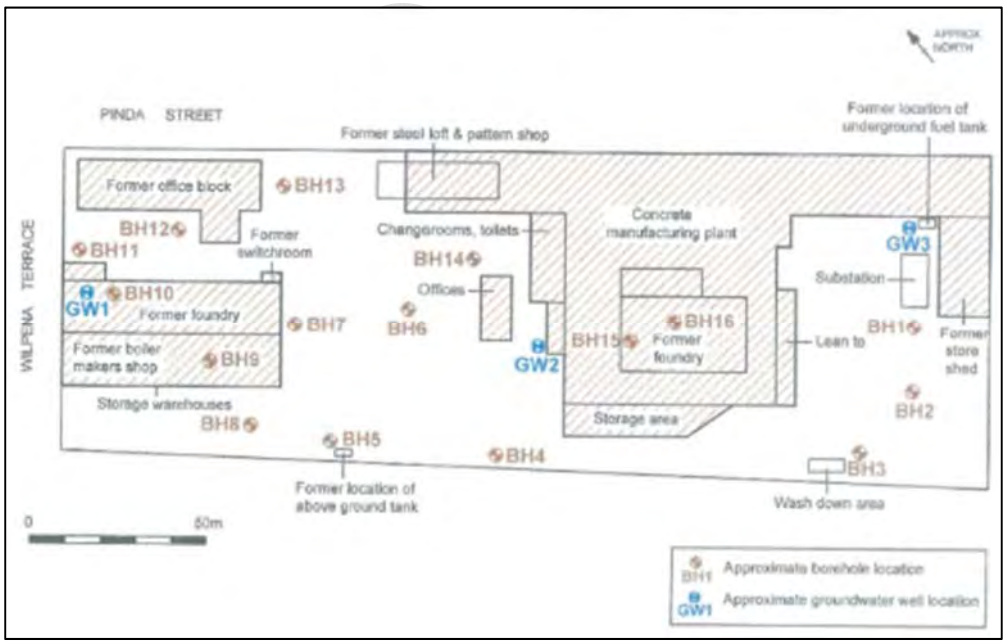


Figure 2: Soil and Groundwater sampling locations across former Bianco site.

The key findings of this study are identified as follows:

- The site was underlain by imported fill ranging from 0.4 to 2.2 metres deep. The majority of the fill comprised of dark brown and black sand. Ash and cinders were noted in the fill in most soil bore locations. The underlying natural soil profile comprised stiff to hard orange brown silty clay.

- Most of the fill had elevated levels of heavy metals (mainly lead, mercury, zinc) and polycyclic aromatic hydrocarbons (contaminants in ash and cinders). The underlying natural soils appeared to be essentially uncontaminated.
- No significant groundwater contamination was identified. The results suggested no widespread groundwater impacts underlying the site, but the possibility of localised impacts was noted as still being possible with due consideration of the type of past land use and industrial operations.
- It was noted that higher levels of contamination were present in localised zones present on the site. For example, there was a very high level of mercury present at one of the soil test locations.
- The site inspection noted that a wash down area near the southern boundary, used for the wash down of concrete moulds, was unpaved and did not have any provision for the containment of runoff or wastewater infiltration to groundwater.

A brief site condition update was undertaken in 2015, this update was limited to a visual assessment of the land and concluded that, since the operations of Bianco ceased in 2011 and the site had since been vacant, the likelihood of significant contamination in terms of industrial/commercial development having concurred at the site since the 2004 investigation was considered low.

Implications for Policy

It is clear from the above investigation that a level of site contamination is apparent within the affected area which will require remediation prior to being appropriate for sensitive land uses. This previously conducted investigation is limited to the former Bianco site and does not provide comment on other industrial land parcels within the affected area, or whether the land is suitable for sensitive use. It is apparent that further investigation will be required prior to the establishment of sensitive uses within certain parts of the Affected Area.

The Charles Sturt Development Plan currently contains policies within the Hazard Module of relevance, of which Principle of Development Control (PDC) 12 relates directly to site contamination. PDC 12 states that development should not occur on land that is contaminated unless, the land has been adequately remediated or the level of contamination does not pose a risk to the intended use.

Further strengthening of policy is suggested within the relevant zone through the inclusion of specific words that identify the contaminated nature of the site and the need for assessment and potential remediation prior to use for sensitive development.

This, along with the General Section provision, is considered to provide adequate policy coverage in relation to this issue and ensures that site contamination will be addressed at the development assessment stage. It is considered unnecessary for the further investigation or remediation to occur as a part of the DPA process.

3.1.4 O-I Adelaide Plant Air Quality Impact Assessment

A recent Air Quality Impact Assessment has been undertaken by Enviroscan in relation to the O-I Adelaide Plant glass production operation.

The O-I glass factory is located adjacent the Affected Area, to the immediate south of the Outer Harbor Railway line. The factory has operated on this site for more than 100 years. Currently the O-I facility operates three furnaces on their site, identified in the Enviroscan report as AD2, AD5 and AD6 each equipped with furnace stacks and roof vents (see Figure below). Normal production of the O-I facility with three furnaces operating, averaged 1026 tonnes per day.

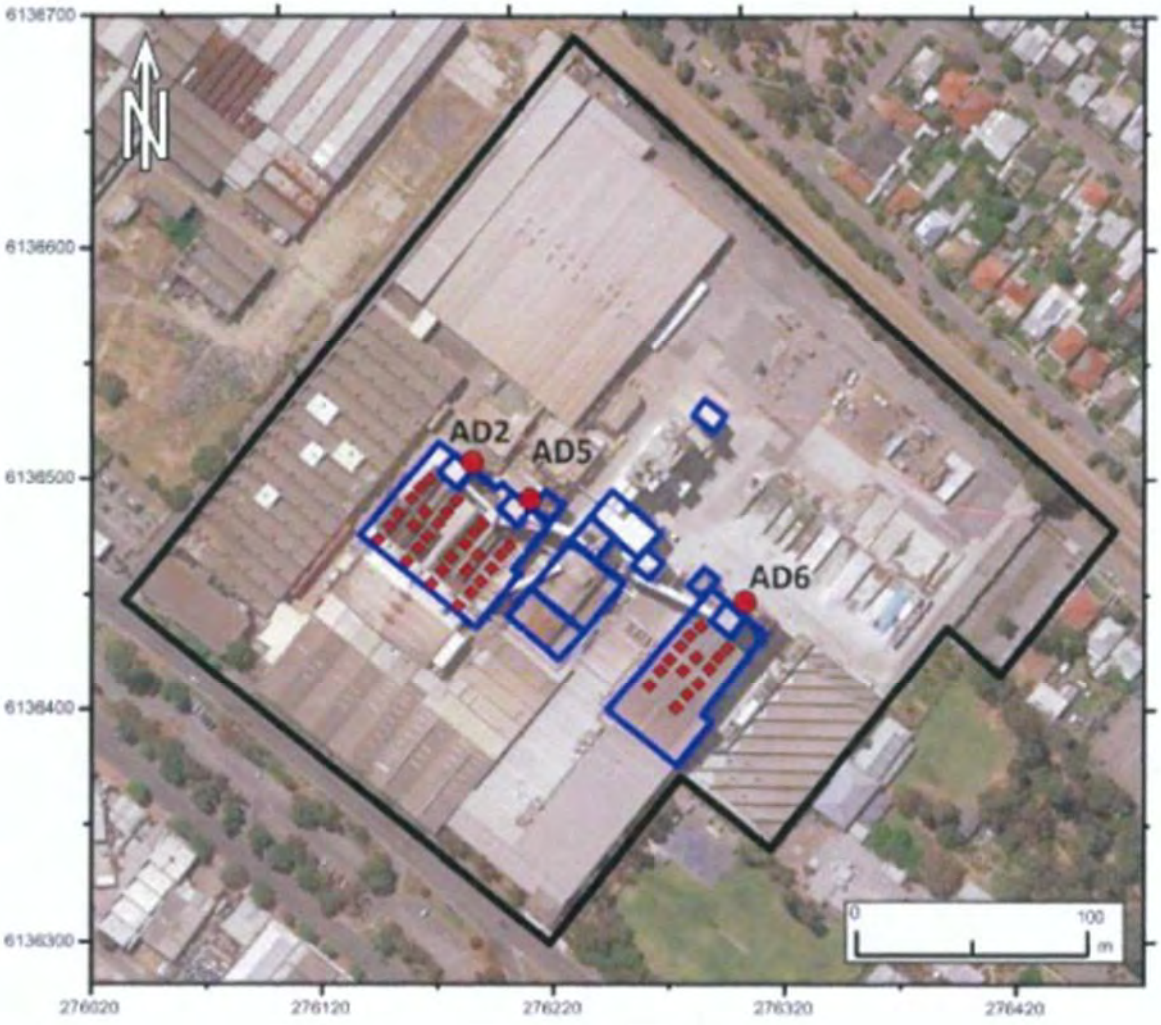


Figure 3: O-I Glass site layout, including furnace, exhaust stacks and roof vent locations.

In accordance with EPA guidelines, Enviroscan undertook air quality modelling using the AUSPLUME model. This included odour, fine particle matter ($PM_{2.5}$ & PM_{10}), nitrogen oxides (NO_2), and sulphur dioxide. In order to adequately assess the air quality implications for multi-storey development within the Affected Area, the assessment included measurements from ground level up to 27 metres in height at 3 – 4 metre intervals. This process was repeated in seven separate locations surrounding the O-I facility, including three locations within the Affected Area. The concentrations of pollutants at each level were predicted and no exceedance of the EPA Ambient Air Quality criteria was identified.

It was also noted that the wind roses plotted indicated that the Affected Area is not downwind from the O-I factory for most of the year and as such will not be affected by the furnaces during these periods.

Through consultation with the Environment Protection Authority (EPA) a series of revisions and scoping changes to the Air Quality Assessment report were made throughout 2018. Written correspondence from the EPA confirms that the most recent revision of the Enviroscan report (dated 8th March 2018), satisfies the EPA requirements, including the Environment Protection (Air Quality) Policy.

Implications for Policy

There is no specific policy response required for the management of air quality from the O-I Glass plant as the levels measured are within the relevant Environment Protection (Air Quality) Policy – including at the heights potentially able to be accommodated following rezoning of the site.

3.2 Investigations undertaken to inform this DPA

In accordance with the Statement of Intent for this DPA the following investigations have been undertaken to inform this DPA.

3.2.1 Urban Form and Densities

Building Heights

The character of the affected area is industrial in nature, largely underdeveloped and contributes poorly to both the adjacent rail corridor, the adjacent residential areas and to a lesser extent David Terrace. Other than for the local heritage place (former Forwood Downs Factory), there is little within the Affected Area which depicts a character which is of value. Given this, wholesale change in both intensity and building form is considered entirely appropriate. This is supported by the presence of some tall and large industrial buildings on the former Bianco site which would not be dissimilar to potential building scales and heights envisaged for the type of development anticipated for the affected area.

The desired form and intensity of development anticipated for the affected area has already been visited as part of the 2009 Transit Oriented Development Study. This anticipated a compact and dense form of development to take advantage of the proximity to frequent fixed public transport infrastructure, as well as accessibility to services and facilities that would service an increased population. Specifically, the study identified the potential for building heights of up to 5 storeys within core areas and adjacent to public open spaces such as MJ McInerney Reserve.

This remains an appropriate target for development within the affected area and is a contrasting urban form to that found within the surrounding neighbourhood. The building height is well within the allowable building heights having regard to Obstacle Limitation Surface Limits associate with the safe operation of Adelaide Airport. The affected area is located within Zone E, which provides for buildings up to 100 metres above ground level before advice and approval from Adelaide Airport Limited is required.

Notwithstanding the desired new form, there is a need to transition the intensity and height of new development where it interfaces with the adjacent zone. Specifically, the interface of the affected area with the adjacent Historic Conservation Area / Residential Character Zone implies a need to temper intensity and building heights so that there is a relationship to existing established character of these locations. This is focussed on Mundulla Street and for the portion of the affected area on the corner of Pinda Street and Arkaba Road.

Figure 4: Existing buildings are tall and large bulky structures. Land is exposed and unsightly, detracting from existing character.

Figure 5: Suggested transition locations to Historic Conservation Area where reduced building heights are appropriate.

Within these transition locations, a reduced building form of 2 – 3 storeys remains a more contextual urban form response, with the immediate interface at two storeys appropriate and providing a building height that is relative to the mostly single storey form of surrounding dwellings. Specific setback distances for the building heights can be quantified to further guide appropriate and contextual design responses based on the visibility of different levels from the footpath on the opposite side of Mundulla Street. These are suggested as:

- two storeys – at interface
- three storeys – 9.5 metres
- four storeys – 15 metres
- five storeys – 22 metres

The policy for these areas will need to respond to the local context by limiting development to a scale and form that does not, to an unreasonable extent, visually dominate and/or overshadow the nearby established residences and the streetscape generally. This is particularly important for the affected area on the northern side of Arkaba Road which interfaces with rear yards of low scale dwellings in the Historic Conservation Area. That being said, it is envisaged that the policy should allow for a transition up in scale, form and dwelling type to the adjacent single storey detached and semi-detached dwellings found on the northern side of Mundalla Street and southern side of Wilpena Terrace. In this sense, the form close to the Mundulla Street frontage is most important and controls limiting this should be reflected within the policy.

Within the portion of the affected area within the Historic Conservation Area (two properties at south-eastern corner of Mundulla Street and Arkaba Road), there is a need to respect the established historic character of this corner which forms part of the original township arrangement and frames this junction. This requires a need to limit building heights to single storey at the street interface and represent this as a differentiation of policy to the remainder of the frontage at this interface.

Aside from building heights, it will be important that new residential development in these interface areas utilise architectural expression and articulation so as to provide visual interest and a variety in form, scale and appearance in order to minimise visual bulk. This needs to be reflected in policy for this location, but is also supported by existing policy within the general section of the Development Plan.

Densities

The original aims for the affected area within the TOD Scoping study identified a range of medium to high density dwellings across the affected area with an average net dwelling density of 100 dwellings per hectare. This would be achieved through various forms of dwelling types, including semi-detached dwellings, row dwellings and residential flat buildings (apartments). This increased dwelling density and range of housing forms will further aid in diversifying the housing stock within the Charles Sturt Council area and not only aid in catering for varying household needs, but also potentially contribute to the provision of affordable (or more affordable) housing in a key strategic location with excellent public transport access.

In examining the range of densities envisaged within the different locations within the Council area, regard has been had to other key growth areas where medium and high density policies have been put in place, as identified below:

Location (Zone)	Min density (dwellings / hectare net)
Bowden (Urban Core Zone)	60 – 270 core area 60 – 230 transition area
West Lakes (Urban Core Zone)	100 – 200 core area 70 transition area
Seaton (Suburban Activity Node Zone)	70 core area 35 transition area
Seaton Park and Findon (Mixed Use Zone)	35 – 70 Less than 35 (Village Living Low precinct)
Woodville West (Residential Zone / Woodville West Policy Area)	70 core precinct 35 – 70 outside of core precinct
St Clair (Residential Zone / Cheltenham Park Policy Area and Woodville Medium Density Policy Area)	20 (Cheltenham) 15 – 40 (Woodville Medium Density)
Devon Park (Residential Zone / Integrated Medium Density Policy Area)	No limitations – focus on dwelling types and built form

Whilst a denser form of development is anticipated in the affected area than the current form in the surrounding areas, it is not anticipated to be the highest intensity and density within the Council area. These locations are set aside for Bowden and West Lakes, where larger areas and greater separation from surrounding established areas exist and allow for better management of the impacts of increased densities.

The densities for the affected area are considered to be more appropriately aligned to those found at Seaton, Seaton Park / Findon, and Woodville West where a similar scale of development and site context is found. This implies a density range of no less than 70 dwellings per hectares for the core locations of the affected area (generally south of Pinda Street) and no less than 35 dwellings per hectare north of Pinda Street, where the interface with adjacent Historic Conservation Area will need to be considered in the intensity and design of development. This would provide a consistent policy setting for the affected area across other similar locations, aligns with the DPTI core policy module suites and will facilitate the transition to a new Planning and Design Code.

Setbacks

Given that there is a desire for a more compact form of development within the affected area, there is a need for reduced setbacks compared to conventional residential development within the surrounding area. This is facilitated by the fact that the affected area has largely exclusive frontage to the southern side of Mundulla

Street and will therefore enable the establishment of a new character on this side of the road from what is currently inconsistent and unattractive at the moment with buildings and sites not fronting and activating the street well and either on or close to the boundary.

It is however acknowledged that two existing dwellings (one of which is vacant / dilapidated) exist and form part of the adjacent Historic Conservation Area. However, these buildings are set back from the Mundulla Street frontage in the order 4 – 5 metres, less than the 6 or more metres typically found for older residential development within the surrounding neighbourhoods.

A setback of 3 metres from the street frontage is considered appropriate to both frame the street with denser building forms, whilst also provide an area of transition between the street and building that facilitates some level of landscaping.

For side and rear setbacks, greater flexibility needs to be provided, including larger and taller expanses on boundaries, to provide for more diverse housing forms. In this regard, the bulk and scale of buildings within a streetscape (including their cumulative form) and the impacts of the built form on the amenity of occupants and neighbours (in terms of overbearing nature, overshadowing and privacy) are considered more important design attributes than an arbitrary distance. In some circumstances, this approach may require larger setbacks than a standard setback distance, and therefore is considered a more appropriate policy response to these more complex design issues.

For locations within the affected area where there is intended to be a focus for non-residential land uses at ground, there is a strong desire to meaningfully frame and activate the street space through minimal setbacks. This would particularly apply to David Terrace (subject to road widening requirements), Pinda Street (east of Arkaba Road) and Wilpena Terrace (south of Pinda Street). The reduced setback will also need to be supported by policies which seek active frontages, maximising fenestration, openings, and integration with footpaths.

There is a need for setbacks to reflect some of the historic character and amenity implications of the parts of the affected area that are in the Historic Conservation Area. In these instances, side setbacks should be increased to those allowed generally to better reflect the historic character in these locations, with taller building forms (ie over two storeys) also further set back to soften the impacts of buildings on the amenity of adjacent low scale residential dwellings.

Implications for Policy

Policy should allow for buildings up to 5 storeys in height, but provide for transitions to the adjacent Historic Conservation Area of 2 to 3 storeys (subject to additional setback requirements at the interface). This should also be accompanied by policy supporting the presentation of a single storey form at the street frontage for the part of the affected area within the Historic Conservation Area. This needs to be quantified and spatially described through principles of development control (in the absence of a concept plan).

The zone utilised should allow for the densities of no less than 35 dwellings per hectare for transition locations and 70 dwellings per hectare for core locations and this implies that the Suburban Activity Node Zone is a good fit for managing such densities.

Reduced setbacks to street frontages and side and rear setbacks should be provided for in the policy.

There is adequate policy coverage within the Design and Appearance and Residential Development modules of the General Section on the issues of visual interface, visual privacy, and overshadowing.

3.2.2 Heritage Place and Historic Conservation Area

Former Forwood Down Factory (Local Heritage Place)

There is a local heritage place located within the Affected Area sited to the immediate north of the Kilkenny Railway Station. This is two storey brick building at the western end of the former Bianco site. The building is listed in the Development Plan as the Former Forwood Down Factory with a long history of industrial uses dating back to the 1880's. The extent of the listing is limited to the original brick building, with the later eastern addition and other buildings on the site excluded.

Figure 6: Former Forwood Down factory (Local Heritage Place) in its current condition.

The potential re-use of this building for industrial purposes is unlikely. Re-zoning of the land may have significant improvement in the potential for adaptive reuse of this heritage place. The form of the building lends itself to numerous land uses including retail, commercial and residential uses, or potentially a mixture of these.

Existing policies within the Heritage Places module of the Development Plan provide adequate policy coverage on the conservation of heritage places and their setting, whilst providing some degree of flexibility in how a development responds to this. As such, additional policy introduced by the DPA is not considered necessary other than for any Desired Character Statement covering the land to actively encourage the adaptive re-use of the building in a manner which positively reflects and conserves its heritage.

The Kilkenny Historic Conservation Area and Contributory Items

Two properties within the Affected Area at the corner of Arkaba Road and Mundulla Street are situated within the Residential Character Zone, and also comprises the Historic Conservation Area.

Figure 7: Extent of Historic Conservation Area and location of Contributory Items relative to Affected Area

This portion of the Historic Conservation Area accommodates a wide range of single storey detached dwellings dating from the 1850's through to the 1950's, with some more recent housing stock dispersed throughout the area. The predominate era for the older housing forms is the 1910 – 1930 Edwardian and Post-Edwardian cottages and bungalows, which is what provides the area with its historic value. The houses are characterised by freestone front walls, red brick side walls and corrugated iron and terracotta tile roofs.

There is a small but intact cluster of Victorian housing and former shops focussed along the southern end of Wilpena Terrace (north of Pinda Street). Mundulla Street forms the edge of the Historic Conservation Area and comprises of a less intact streetscape of Victorian dwellings, with a greater number of later dwellings that are inconsistent with the historic character.

17 and 19 Mundulla Street are the only two properties on the southern side of Mundulla Street (east of Arkaba Road) that are situated within the Historic Conservation Area, and are also identified as Contributory Items, being buildings from the predominant era. The area was extended to include the two properties in 1997.

The two buildings themselves are either somewhat modified from their original form, or are in very poor condition (as documented in Figures 8 and 9 below). Notwithstanding this, the two dwellings remain representative of the form and character of the early settlement and reinforce this corner of the road junction, similar to the Mundalla / Wilpena junction.

Contributory Items are not considered to have heritage value, rather their significance is placed within the traditional design characteristics, proportions, composition and materials reflected in the clustering of buildings within an area of historic character. Therefore, while the two buildings can potentially be demolished into the future, the replacement development should continue to be respectful and complementary to the established historic character present at this junction. The retention of the Historic Conservation Area is therefore warranted, even if the zoning for the land is changed.

Figure 8: 19 Mundulla Street dwelling and its state of disrepair

Figure 9: 17 Mundulla Street has been heavily modified from its original form

Implications for Policy

There is adequate policy coverage within the Heritage Places and Historic Conservation modules to ensure that new development conserves the setting and historic significance of Local Heritage Places and Contributory Items both within and adjacent the Affected Area.

There is a need to reference the presence of the Local Heritage Place within the zone, as well as the presence of both the Historic Conservation Area and Contributory Items within a portion of the new zone proposed for the site. This is best achieved through the desired character statement.

3.2.3 Affordable Housing

This DPA proposes policy to provide for medium to higher density housing in a location which has excellent access to public transport, retail and commercial facilities and community facilities. In addition, it is likely to result in the development of more than 20 dwellings within the affected area, of various forms and sizes. As such, it is considered appropriate that it also encourages the provision of affordable housing as part of the overall development.

The Affordable Housing Overlay and policies already exist in the Development Plan. These policies provide guidance for the provision of affordable housing for developments comprising more than 20 dwellings which is likely to be the case for the development of the affected area. The DPA therefore proposes applying the Affordable Housing policies to the affected area.

Implications for this DPA

It is recommended that the Affordable Housing Overlay and policies be applied to the affected area.

3.2.4 Non-Residential Land Use Interface

Interface between the Affected Area and nearby non-residential land uses is an important consideration as part of this DPA. As previously discussed, the O-I facility is the key adjoining land use and closest EPA Licenced operation to the site. Understanding the interface implications between the Affected Area and the O-I facility is of particular importance to this DPA. As such, noise and air quality assessments have been undertaken to inform this DPA and are addressed in more detail in separate investigations. It is also noted that there are other land uses within the locality of consideration including rail and road corridors, and other EPA licensed activities; the ADRAD Group facility, and the DULUX Group facility (both licenses are for Waste treatment and disposal).

Figure 10: Location of Licensed Activities surrounding the Affected Area

The O-I Glass Factory

Located in close proximity to the south-east of the Affected Area. It is understood the EPA licence for this facility include:

- Petroleum and Chemical (Chemical storage and warehousing facilities)
- Manufacturing and mineral processing (Ceramic works)
- Waste treatment and disposal (Activities producing listed wastes)
- Other (Fuel burning – not coal or wood)

The EPA Evaluation Distances for Effective Air Quality and Noise Management guidelines lists evaluation distance requirements for the Chemical Storage and Warehousing activity and the Ceramic Works. The chemical storage requires an evaluation distance of 500 metres, while the ceramic works requires an evaluation distance of 750 metres. The fuel burning activity requires an individual assessment.

The Affected Area falls within the 750-metre evaluation distance. This requires assessment of relevant amenity impacts to be undertaken to demonstrate that sensitive uses will not be subject to unreasonable impact from the activity. The Air Quality Assessment undertaken by Enviroscan demonstrates this in relation to the issue of air quality and the Noise Impact Assessment undertaken by Sonus addresses the noise levels and interface implications.

The findings of the Enviroscan Air Quality Assessment (See section 3.1.4) indicate that the recording of air quality within the Affected Area with three furnaces operating at the O-I Facility did not exceed accepted EPA air quality levels and as such a reduced evaluation distance is appropriate for the affected area (in relation to air quality impacts).

An assessment has been prepared by Sonus on the acoustic impacts of the O-I Glass facility on the affected area (see Appendix C). This has been based on a detailed model developed for the site, having regard to its operation at full capacity (which is what the current licence covers) despite existing operations occurring well below this, and is therefore conservative in nature.

The assessment indicates that across the affected area, there will be a need to provide noise attenuation to dwellings to provide a suitable indoor noise level consistent with the Environment Protection (Noise) Policy 2008. This would require reductions in the range of 20 to 36dB(A) across the site (for night time levels). The assessment considers this to require treatments for facades in accordance with Sound Exposure Categories (SECs) 1 to 4 within the *Minister's Specification SA78B – Construction Requirements for the control of external sound*. The assessment also considers that treatments and orientation of balconies and open spaces would also need to shield against the noise source and this can be addressed by the placement and design of buildings across the affected area (and is likely to be less of an issue further north and west of the site).

The assessment recognises that reductions in these requirements may be appropriate where shielding occurs, as potentially may be the case for a large proportion of buildings away from the southern and eastern boundaries of the affected area, and this can be further considered and argued as part of specific development proposals.

Other Licensed Activities

The ADRAD Group Facility is a manufacturer of radiator and air conditioning products located approximately 700 metre south west of the Affected Area. The DULUX Group Facility is a paint and coating manufacturing plant that is approximately 630 metres south east of the Affected Area. Both of these facilities are licensed for Waste treatment and disposal (Activity producing listed wastes). The EPA Evaluation Distances for Effective Air Quality and Noise Management guideline does not list an evaluation distance requirement for these forms of waste producing activities. However, given the close proximity of existing residential development to these facilities, the distance of these facilities to the affected area and the EPA not raising concerns about these facilities in initial engagement, it is unlikely that there would be any noise or air quality impacts from these licensed activities to any sensitive developments within the affected area.

Other Non-Licensed Activities and Sources

Other notable land uses within the locality with potential interface implications include the recently approved Commercial and General Warehouse on the former Shearer's site (now demolished), the Outer Harbor Railway line and Kilkenny Station, Kilkenny Road/David Terrace, and to a lesser extent Port Road and commercial activities along this corridor.

The proposed warehouse was approved by Council in November 2018 and comprises a building of 3.75 hectares in area. The facility is intended to operate 24 hours and will be serviced by semi-trailer trucks loading and loading from the northern loading dock adjacent the rail corridor. An acoustically baffled loading area canopy, along with a 1.8m high acoustic fence formed part of the approval for this facility in response to a noise assessment on adjacent residential development. However, this did not include consideration of residential development within the affected area. It is understood that the facility will be utilised by O-I Glass, but can be utilised by others in the future.

Figure 11: Approved Warehouse development on the former Shearer's site to the immediate south of the Affected Area

Sonus, in their acoustic assessment, have included consideration of the noise sources from this approved development on the future establishment of sensitive residential land uses within the affected area. The acoustic implications are linked to, and similar to those of the O-I Glass facility, and can be addressed through appropriate design and construction of dwellings within the affected area in the same way noise from the O-I facility can be mitigated.

Road and Rail Noise Sources

The Kilkenny Railway station services the Grange and Outer Harbor lines in both directions and is subject to regular use by public transit. Sonus have considered the acoustic implications of these activities on the establishment of dwellings across the site and in particular note that the Minister's Specification SA78B identified the following sound exposure categories for the following distances from the road or rail noise source.

Sound Exposure Category (SEC)	Separation from Train line (metres)	Separation from Type A Road - speed limit 60km/h (metres)
1	25 < 50	60 < 100
2	10 < 25	35 < 60
3	< 10	15 < 35
4	N/A	< 15
5	N/A	N/A

Table 1: Minister's Specification SA78B Rail and Road Sound Exposure Categories and Distances

The implications of these SEC criteria will require minor treatments to facades within 15 metres of the rail corridor and more substantive treatments to facades along Kilkenny Road for any residential dwellings between David Terrace and Wilpena Avenue, with more minor façade treatments for dwellings east of Wilpena Terrace (up to a distance of 50 metres only). It is likely that residential uses along the road corridor itself will not occur, given the reduced amenity provided, however the policy should provide flexibility for this to occur above ground level and, as such, those measures would need to be addressed as part of any building design.

It is noted that the requirements and treatments for residential development along David Terrace would be no different to those applicable to other corridors within the Council area and metropolitan Adelaide generally.

Implications for Policy

DPTI has prepared the Noise and Air Emissions Overlay specifically to better manage noise and air quality impacts on development from noise sources such as higher order roads, rail and tram lines and mixed-use development. The policies guide design to mitigating noise and air quality impacts both through the placement of sensitive activities (such as open spaces, bedrooms etc) as well as the construction of buildings. The latter is addressed through the application of the Minister's Specification SA 78B for the *Construction Requirements for the Control of External Sound,* which forms the basis for recommendations made by Sonus in their assessment of noise mitigation measures.

Given the presence of both an arterial road and rail corridor adjacent the affected area, as well as the potential for a mixture of land uses across the site, along with those within and adjacent the affected area, the application of the Noise and Air Emissions Overlay is entirely appropriate to provide suitable policy support or development across the affected area.

The policy recommendations made by Sonus are noted, however are seen as largely replicating the policy within the Noise and Air Emissions Overlay. An added complexity of facilitating potential reductions in SEC levels (as suggested by Sonus) is the inability to represent these spatially in a Concept Plan given these are no longer accepted by DPTI and will not exist within the new Planning and Design Code. The ability to consider potential reduced SEC category solutions for development can be appropriately addressed as part of any future development applications through documentation from an appropriately qualified acoustic consultant, having regard to potential shielding opportunities supported by acoustic evidence against the Minister's Specification requirements and guidelines.

Consideration has been had to other circumstances where the application of policy for locations proposing sensitive land uses adjacent to licensed activities has been applied. The Urban Renewal Zone within both the West Torrens and Port Adelaide Enfield Council Development Plans includes policy which specifically addresses this issue and provides the required guidance for assessing planners to ensure noise, odour and air quality issues are addressed as part of the design and siting of future dwellings within the affected area. This policy should also be included within the proposed zone, together with reignition of this interface within the Desired Character Statement.

3.2.5 Traffic Impact Assessment

A Traffic Impact Assessment has been undertaken by GTA Consultants based on the potential development scenario for the affected area (see Appendix B). The assessment examines the existing traffic conditions, alternative transport capacity (cycling, pedestrian, public transport), likely traffic generation as a result of the development of the affected area to its full potential, as well as the potential impact on traffic volumes on the performance of the surrounding road network, particularly David Terrace.

Sustainable Transport

The site is highly accessible by public transport (rail) services and local bikeway connections, providing opportunities for travel without reliance on the private car. There is a bus stop located on David Terrace approximately 100m south of Wilpena Terrace servicing Route J8 which provides access to Marion, West Lakes, Arndale Centre, Queen Elizabeth Hospital and Adelaide Airport, although this is only running on

weekdays. Additionally, Kilkenny rail station on the Outer Harbour & Grange line is located immediately adjacent the site and provides services to Adelaide CBD, Outer Harbour, Grange and locations in between including Bowden). Further growth in population within close proximity of these services will aid in boosting their use and supports further investment in their delivery.

Sealed pedestrian paths are generally located on both sides of the roads within the vicinity of the subject site, supporting active travel modes. An existing bicycle route along the railway corridor alignment uses local secondary roads to provide a route past the affected area. Provision for the future greenway alignment along the railway corridor is a significant opportunity with the redevelopment of the affected area. Other key cycle connections include north-south along Aroona Road, connecting Port Road, across the rail line, through to Torrens Road.

Two key pedestrian crossing points over the rail line are located at the Kilkenny Road junction and the southern end of the extended rail platform, adjacent to the northern edge of MJ McInerney Reserve. It is important that future development of the affected area recognises these important pedestrian and cycle connections.

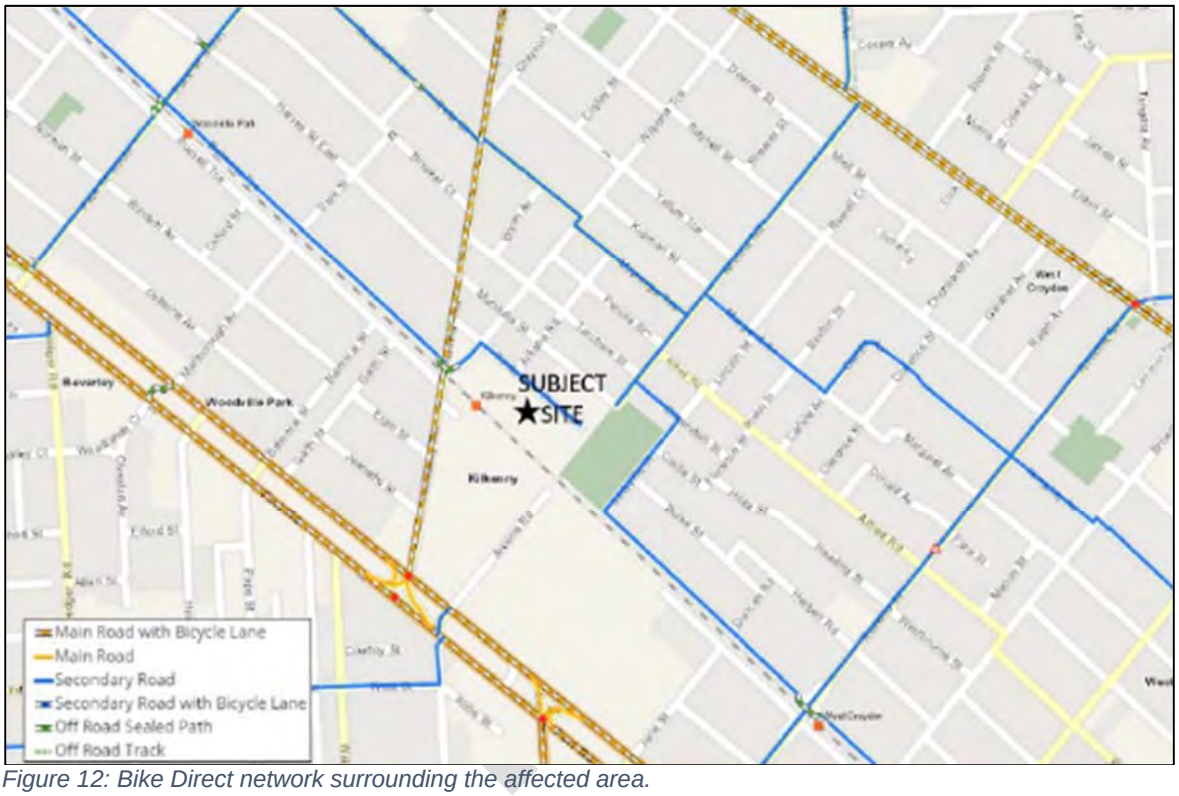


Figure 12: Bike Direct network surrounding the affected area.

Car Parking

The potential development will be required to provide both off-street parking for residents and visitors, particularly for commercial and retail development. In addition, there is a need to seek to accommodate on-street parking within the affected area. In this regard, preference for minimising the number of driveways and driveway crossovers will not only facilitate the provision of on-street parking, but also improved streetscaping opportunities and spaces for pedestrians. The forms of development envisaged for the affected area, such as apartment buildings and terraces have a far greater potential to be planned to provide communal parking spaces either at grade or in basement / undercroft car parks, as well as rear loaded individual garaging accessed from communal internal driveways. This should be supported and encouraged by policy within the Development Plan.

The ratios to accommodate parking demand are identified within the Development Plan for different locations and types of development as summarised by the tables below. Table ChSt/2 provides for parking requirements for more residential development across the Council area (other than for the Urban Core Zone). Table ChSt/2A on the other hand provides for reduced parking ratio requirements for selected zone

locations, reflective of the proximity and high accessibility of these zones to frequent public transport, typically in the form of a station of a rail service (tram or train). These areas are described as Designated Areas and have a lower car parking requirement for non-residential development.

Table ChSt/2 – Off-Street Vehicle Parking Requirements

Type of Development	*Car Parking Requirement*
Dwelling (detached and semi-detached)	2 on site car parking spaces, one of which is covered (the second space can be tandem)
Dwelling (group, row and residential flat building)	
3 or more bedrooms (or >130sq.m)	1.25 spaces per dwelling plus an additional 0.25 visitor parking spaces
2 bedrooms (or 75-130sq.m)	1 space per dwelling plus an additional 0.25 visitor parking spaces
1 bedroom (or <75sq.m)	1 space per dwelling plus an additional 0.25 visitor parking spaces

Table ChSt/2A – Off Street Vehicle Parking Requirements for Designated Areas

Designated Areas	*Vehicle Parking Rates*
District Centre Zone Local Centre Zone Neighbourhood Centre Zone Suburban Activity Node Zone Conditions: Any part of the development site is located in accordance with at least one of the following: … (d) within 400 metres of a passenger rail station that part of a high frequency public transport service.	Non-residential development excluding tourist accommodation (a) Minimum 3 spaces per 100m² of gross leasable floor area (b) Maximum 6 paces per 100m² of gross leasable floor area

Given the proximity of the affected area directly adjacent to the Kilkenny station on the Adelaide to outer Harbour / Grange line, as well as other services which operate along David Terrace, it is appropriate that the affected area is identified as a Designated Area for the purposes of car parking associated with the form of non-residential development envisaged for the land.

Traffic Generation

GTA have modelled potential traffic generation from indicative development within the affected area on the assumption that the affected area will accommodate up to:

- 500 additional dwellings
- 1,400m² of retail floor space
- 1,400m² of commercial floor space.

Based on the above development capacity, the site is expected to generate in the order of 360 trips in the peak hour and 3,450 trips across the entire day. This anticipated generation is conservative as it does not assume local trips to retail facilities being made through active transport modes, nor increases in use of public transport. As such, it is a conservative estimate of impacts on the surrounding road network.

Based on a series of assumptions about the distribution of traffic throughout the affected area and surrounding road network (informed by existing traffic volumes observed), the traffic generated by the proposed development, whilst likely to increase current volumes due to the vacant nature of the affected area, will maintain the local road function of the surrounding road network and the volumes along David Terrace would be able to be accommodated. The exception to this is Mundulla Street which will marginally exceed the volumes typically associated with a local road to one of a local collector road.

An assessment of the anticipated volumes and traffic generation modelling has been undertaken and agreed to by DPTI.

GTA has considered the intersection functions along David Terrace and within the affected area with the additional volumes and has observed the following:

- A channelised right turn lane on David Terrace into Pinda Street is not the most ideal design solution from a safety perspective due to the proximity of the railway line and the limited width of the David Terrace road reserve to accommodate the turning lane without the loss of parking to the front of existing shops in this location. Instead, this will likely need to have a median placed across the junction to limit movements to left-in and left-out from Pinda Street (and modelling has worked on this assumption).

- Additional traffic volumes at the Mundulla Street/David Terrace intersection will increase queues in the channelised right turn lane on David Terrace (for vehicles waiting to turn right) but remain within the capacity of the existing channelised turning lane (even with additional traffic volumes diverted from the left-in / left-out Pinda Street treatment).

- Recent crash history for the Mundulla Street and Wilpena Terrace intersection suggests additional volumes would support upgrading of this intersection to better facilitate sight lines. Suggested improvements include better alignment and delineation of kerbs on the Mundulla Street approach from the north-west.

Implications for Policy

The policy coverage of design issues associated with the location and design of access, parking and movement networks is contained within the Transportation and Access module within the General Section of the Development Plan. The policies within this section include coverage of the following issues of relevance to the Affected Area's future development:

- minimising access to an arterial road through consolidation of access points
- safety in the location of access points in accordance with Australian Standards
- the design of off-street car parking in accordance with Australian Standards
- minimising pedestrian and vehicle conflicts
- providing suitable pedestrian and cycling connectivity and access
- provision of suitable servicing of development by accommodating larger vehicles.
- the provision of adequate parking (referencing the ratios identified within Tables ChSt/2 and 2A)

However, the addition of the Outer Harbor Greenway cycling route along the railway line adjacent the affected area will require site specific policy recognition. This is best achieved through a local addition principle of development control.

It is possible that works associated with the future development of the Affected Area may require minor alterations to the DPTI controlled road (David Terrace), such as restricting Pinda Street to a left-in, left-out arrangement via a median. However these are minor works that can be considered within a deed as part of any future development application for the site which triggers such a treatment. No separate Deed of agreement is required to accompany this DPA, particularly as initial development (such as along Mundulla Street) is unlikely to have any implications for the junctions.

3.2.6 Infrastructure Assessment

KBR has undertaken a preliminary investigation of the existing infrastructure capacity for the affected area to identify any need for upgrades to accommodate the anticipated future development scenario. The full report is contained within the Appendices and is summarised below.

Flooding and Stormwater Management

The capacity of the existing stormwater system and flood susceptibility of the affected area and surrounding land has been investigated based on Council's stormwater detention criteria which is that all 1% AEP (1-in-100-year event) post development flows not exceed those of the pre-development 0.2 AEP (1-in-5-year event) flows. The affected area was divided into two catchments, reflective of the existing division by the road network and available connection points into the existing stormwater system. The results of the hydrological calculations indicate that onsite detention of approximately 650m^3 is required to meet Council's stormwater detention criteria, as summarised in the table below:

Catchment	Area	Pre-development 0.2EY	Post-development 1% AEP	Storage Required
Arkaba Road	0.82 ha	92 L/s	235 L/s	143 m^3
Pinda Street	3.01 ha	290 L/s	651 L/s	504 m^3

The figure below summarises how KBR envisage the proposed development draining with suggestions for potential storage and collection locations.

The 143 m^3 of detention required for the Arkaba Road catchment could be attained by installing approximately 130 metres of 900 mm x 1200 mm reinforced concrete box culverts along a potential rear laneway for properties fronting Mundulla Street and Pinda Street (as well as other techniques, or a combination of techniques). The 504 m^3 of detention required for the Pinda Street catchment could be attained by a detention basin, an underground tank, oversized pipes, or a combination of these.

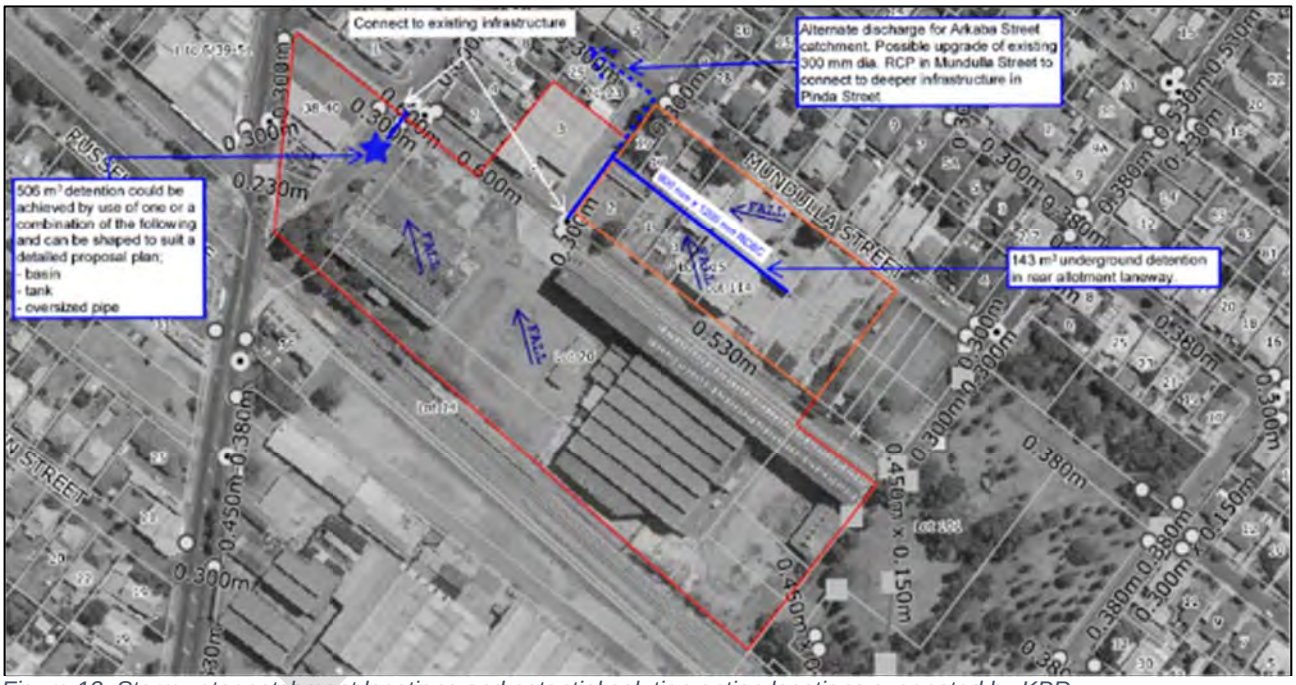


Figure 13: Stormwater catchment locations and potential solution option locations suggested by KBR.

In order to achieve the principles of Water Sensitive Urban Design (WSUD), up to 250m^2 of bioretention is required to ensure the runoff generated from the site is treated before being discharged into the Council drainage network. This can be through a range of design measures integrated into either new road reserves, upgrades of existing road reserves (particularly Pinda Street), the creation of new plaza spaces, or through the installation of an oil and sediment trap which would further reduce the overall area required. Once again, the coverage of this issue is a detail for future development applications, and there is sufficient policy coverage within the Natural Resources module of the existing Development Plan to adequately address these requirements.

In regard to flooding potential, Council's floodplain mapping data confirms that the site is not affected by flooding from external catchments.

Stormwater Management matters can be better addressed as part of any detailed development proposal. The Natural Resources module within the existing Development Plan provides a suitable suite of policies which seek the appropriate management of stormwater, including detention, retention, reuse, as well as the management of water quality and it is considered unnecessary to provide additional policy support on these matters as part of this DPA.

The Hazards module addresses the need to manage flood risk and the manner in which future development responds to this can be adequately addressed through future development applications.

Infrastructure Analysis

Further consultation with service authorities has been undertaken to determine the infrastructure capacity of key infrastructure in the vicinity of the site. In particular, anticipated demands have been considered based on the maximum development scenario of 500 dwellings, in order to determine what, if any, upgrades to infrastructure on the site, and trunk infrastructure beyond the site, are required as part of the DPA. The findings are as follows:

Potable Water

- the established network has capacity
- 340m of existing mains water infrastructure in Pinda Street is not compliant with current standards for high density residential development and will require upgrading to a new DN 200 main
- Depending on layout of future development, fire service and pressure requirements will need further assessment and consideration (to be determined as part of a development application).

Sewer

- Existing sewer infrastructure is available and suitable for a future development scenario for residential with ancillary commercial less than 0.1 hectares (1000 m^2)
- If more than 1000m^2 of commercial development is established within the affected area, SA Water estimate that sewer main in Aroona Road, south of Margaret Avenue, will require upgrade from DN 150 main to DN 225 main.

Electricity

- The Kilkenny substation has adequate spare capacity and standard augmentation rates would apply
- SA Power Networks request that total load be split across both available feeders, as follows:
  - Feeder AP-372D David Terrace
  - Feeder AP-372F Aroona Road

Gas

- The existing 200SP gas main in Aroona will support future development scenario

Communications

- NBN Co. advise that they will be able to supply fibre to the premises for future development

On the basis of the above, KBR concluded that the likely future development scenario for the Affected Area can be serviced by potable water, sewer, electricity, gas, and telecommunications.

Implications for Policy

Stormwater Management matters can be better addressed as part of any detailed development proposal. The Natural Resources module within the existing Development Plan provides a suitable suite of policies which seek the appropriate management of stormwater, including detention, retention, reuse, as well as the management of water quality and it is considered unnecessary to provide additional policy support on these matters.

The Hazards module addresses the need to manage flood risk and the manner in which future development responds to this can be adequately addressed through future development applications.

No specific policy on the provision of infrastructure is considered necessary at the Zone level. It is considered there is appropriate coverage provided within the Infrastructure Module of the General Section.

Infrastructure improvements or future layout will be dependent on the future development of the site and are best addressed at the development assessment stage. This will particularly relate to whether commercial development above 1,000m² is achieved on the site. There is no specific need for a Deed for Agreement for Infrastructure provision to accommodate the development as part of this DPA.

3.2.7 Public Open Space

The DPA intends to create a policy framework which supports intensification of residential development within the Affected Area. It is anticipated that the DPA will facilitate an increase in the local residential population and allow for higher density housing forms such as apartments. As the anticipated residential form has reduced capacity for private open space, it will be important that an adequate level of public open space is available to service both the established and additional population.

Council commissioned the Best Practice Open Space in Higher Density Developments Project in 2011 that explored whether the 12.5% legislative public open space requirement for land divisions was suitable for application to medium and high-density urban environments. A key conclusion of the study confirmed that a 'one size fits all' approach is not appropriate and a needs-based assessment should be made. In some higher density developments, there will be justification for more than 12.5% of land to be allocated to open space. The study also suggests that in some other instances there could be justification for less than 12.5%, for example where these is a high provision of open space adjoining the development area. This is of relevance to the Affected Area given its proximity to MJ McInerney Reserve.

Applying the highest order development scenario to the Affected Area, that being the entire 3.3-hectare site is developed for substantial high density living (100 dwellings per hectare), and assuming that the Council's average household size of 2 people per dwelling is applied, the existing 2.45-hectare MJ McInerney Reserve would still achieve the desired benchmark of the 2 hectares per 1000 people discussed in the study.

Council's Open Space Strategy 2025 (the Strategy) has been prepared to strategically provide, develop and manage open space over the 10-year period. The Strategy identifies Kilkenny as an area which does not have a gap in the provision of public open space, indicating that the current provision of space in the area is adequate for population level at the time of writing. Additionally, it is noted that the railway corridor running adjacent to the Affected Area is identified as a key Greenway (bike route) opportunity.

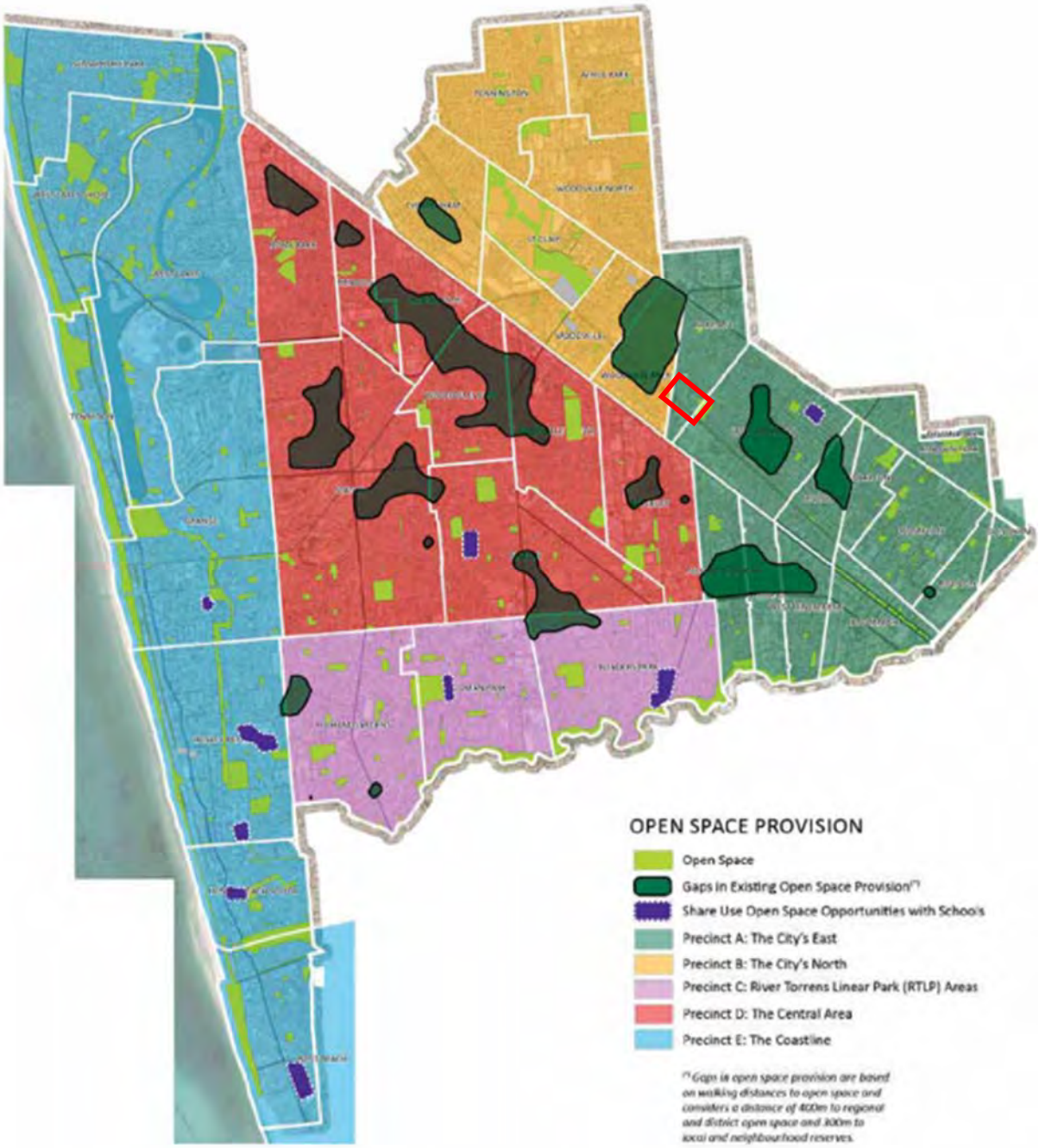


Figure 14: Open Space Provision – Open Space Strategy 2025

A key feature of the wider locality is the MJ McInerney Reserve, which is located to the immediate east of the Affected Area. The MJ McInerney Reserve is identified within the Strategy as a District Level Open Space location. The Strategy identifies a master plan and upgrade for the reserve (now occurred), which focuses on the provision of picnic space, high level play space, passive and active activity space, and provide an overall youth and event focus.

Figure 15: Plan of the MJ McInerney Reserve Upgrade

This reserve is a large public recreation area covering an area of 2.45 hectares along the western alignment of Sackville Street. The reserve is the primary and largest public amenity and open space feature in the Kilkenny area and services a significant residential population living nearby.

The MJ McInerney Reserve has recently received a significant upgrade and redevelopment that included:

- new internal pedestrian pathway networks
- new play spaces (junior & senior)
- sheltered picnic facilities
- amphitheatre
- exercise equipment
- new basketball court with lighting
- existing tennis courts x 2
- improved toilet facilities
- skate park
- open grassed areas for event space, recreation activities
- extensive landscaping

Whilst being located some distance from the Affected Area, there are a number of other smaller public reserves within the wider locality which service the established Kilkenny residential population, these include:

- Gelland Reserve and Soldiers Memorial (Rowell Crescent)
- Peace Reserve (Rosetta Street)
- Carnarvon Reserve (Carnarvon Parade)
- Alton Reserve (Reynell Street)

It is noted that a portion of the Affected Area is identified as a public reserve (Wilpena Terrace Reserve). This reserve is located in the small triangular shaped parcel of land at the intersection of Wilpena Terrace and Kilkenny Road/David Terrace.

Whilst the DPA is intended to facilitate a significant increase in the residential population for this suburb, given its proximity to MJ McInerney Reserve and the substantial size and extensive offerings of this space, it is considered that adequate public recreation space will be available to service the both the existing and future residents without the need for the DPA to apply spatial requirements for additional open space within the Affected Area.

Notwithstanding the provision of open space, the 2011 Best Practice Study also identified that open space in medium and high-density mixed-use environments needs to be more diverse than a public park, with plazas and the streetscape public realm forming an important contribution to both amenity and activation through landscaping and use. In key locations, such spaces make a positive contribution to liveability for occupants of medium and high-density developments.

For the affected area, key locations for such spaces would include a potential plaza space at the end of Wilpena Street, linking the northern end of the rail station platform, connections across both the rail and David Terrace, as well as delineating a sense of arrival to the Precinct from this location (northbound). Given this area is likely to be the focus for non-residential activity due to its visibility and reduced amenity for residential development, a plaza space in this location has the potential to also complement and extend the retail and commercial function and space established within the affected area, as well as providing passive surveillance and contributing to a sense of safety for public transport users.

Implications for Policy

Given the presence of the MJ McInerney Reserve there is no need for further public open space provision within the Affected Area and no need for further policy coverage in this regard.

There is scope for the creation of a public plaza space within the existing road reserve adjacent to the northern end of the rail platform and building on the existing Wilpena Street reserve. The establishment and provision of the plaza should be reflected within a local addition principle of development control which also identifies its function and how development should address the space.

3.2.8 Pedestrian and Cycling Connectivity

The existing pedestrian infrastructure within the affected area comprises sealed pedestrian paths generally located on both side of the roads, with the exception of Pinda Street, which only has a sealed footpath on the northern side of the carriageway. A pedestrian maze crossing across the railway line is located on the east side of David Terrace, to the west of the Kilkenny Railway Station, as well as the southern end of the affected area, providing access to Aroona Road opposite, extending to Port Road.

An existing bicycle route along the railway corridor alignment uses local secondary roads to provide a route through the subject site. Wilpena Terrace, Pinda Street, MJ McInerney Reserve and Sackville Street form part of the route that deviates from the railway corridor. The Open Space Strategy identifies a new greenway (shared use path) along the alignment of the rail corridor which will rationalise the bicycle route in this location. There is insufficient room within the existing rail corridor to accommodate such a route, particularly at the station platforms, and as such additional land within the affected area is required to facilitate this important cycling infrastructure.

It is expected that the development of the affected area would improve both the connections to key locations in the surrounding locality, as well as the pedestrian environment within the streetscape and public realm. The vacant underutilised site currently acts as a barrier to accessing the station platform for communities to the north and east which should be addressed through road layout and the provision of pedestrian paths. There is also an opportunity for the development to maximise connection for future occupants to the MJ McInerney Reserve immediately to the south. These connection locations, along with an indicative road layout are identified in the Figure below.

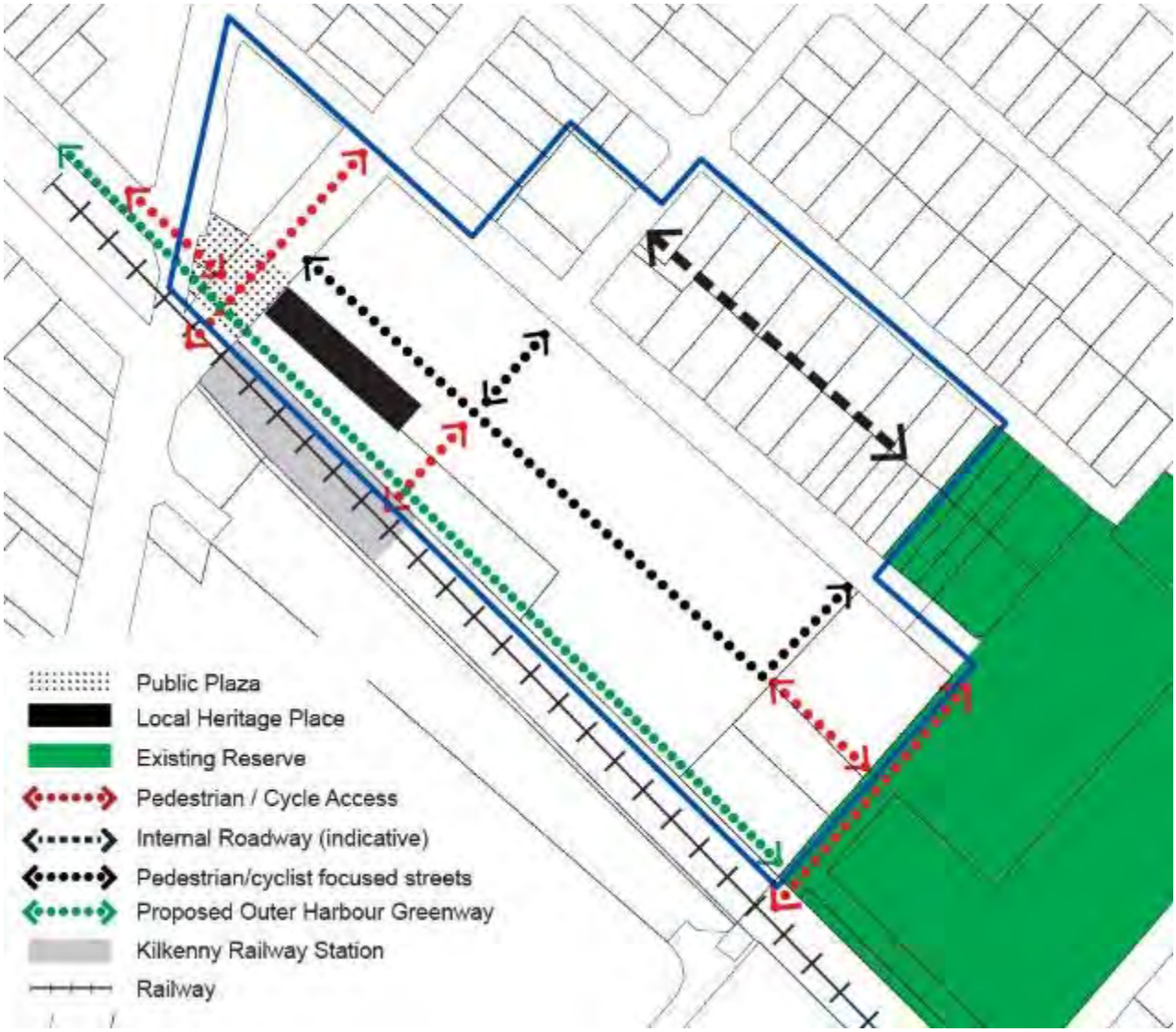


Figure 16: Anticipated new road, pedestrian and cycle path connections

Implications for Policy

The policy covering the affected area should include for the provision of the Adelaide – Outer Harbour Greenway, as well as connections from the station to Arkaba Road and MJ McInerney Reserve. This is best achieved through additional principles of development control.

The policy should also support improved pedestrian environments within new streets created within the affected area. This is most appropriately expressed within the desired character statement for any future zone / policy area.

3.2.9 Non-Residential and Community Uses

Retail Uses

An assessment of the surrounding retail land uses has been undertaken to understand the extent of servicing within the catchment within which the affected area is positioned, and therefore determine the level of retail and commercial floor space likely to be desired within the affected area.

The affected area is situated within 900 metres of the Arndale District Activity Centre (to the north), 1.2 kilometres of the Woodville Road District Centre (to the north-west) and 1.2 kilometres from the Welland Neighbourhood Centre (to the south-east). These centres include the following retail and entertainment facilities that service the surrounding catchment, including the affected area:

- Coles, Woolworths, Aldi and IGA supermarkets
- Multiple Discount Department Stores (Big W, Harris Scarfe)
- numerous specialty retail stores (principally at Arndale)
- Greater Union Cinema
- numerous cafes and restaurants.

Given the extent and proximity of supermarket retailing within the surrounding catchment of the affected area, it is unlikely that an additional supermarket facility will be required within the affected area, and as such, accommodating larger scale retail tenancies is not considered necessary within the policy framework. There may be scope for the establishment of smaller scale general store type retail store on the site to accommodate the day-to-day needs of surrounding community, as well as those public transport commuters, however these facilities are unlikely to require retail floorplates larger than 1,000m².

The provision of larger floorplate retail land uses, such as bulky goods outlets, are not envisaged or supported for this location, principally due to their large nature, the fact that they are not considered the best use of this location and the traffic impacts they have within the local road network.

It is important that retail and commercial uses are facilitated and focussed within the affected area, both to take advantage of and support investment in public transport infrastructure in the rail line, but also provide local employment and contribute to the replacement of previous jobs lost in this location.

Focussing these activities spatially within the affected area will provide for a focus of activity, but also facilitate reducing conflicts with new and existing residential development and minimise commercial vehicle servicing movements within the local road network. The focus for these activities within the affected area should be towards the David Terrace frontage, to maximise activation, build on the exposure to passing traffic, and the reduced amenity for residential development, but can also extend east of Wilpena Terrace, supporting the creation of a plaza space and aided by pedestrian traffic to and from the rail station platform. Activation of façades in these locations is important in providing vibrancy in this location.

Community Uses

In 2011 Elton Consulting; on behalf of the City of Charles Sturt, Playford, Salisbury, Onkaparinga, and the Local Government Association; undertook investigation into the planning for social infrastructure and community services for future urban growth areas. This investigation examined case studies and literature around this issue and developed a best practice guide for planning social infrastructure in urban growth areas for Greater Adelaide. A fundamental consideration is to ensure that social infrastructure planning reflects and responds to community needs, expected growth in demands from growth in population and to the unique and individual circumstances of each area.

The study provides a Community Facilities Spatial Plan Scenario for the City of Charles Sturt (see figure below) which divides the area into three districts, the Western District, Central District, and Eastern District. The affected area is located in the Eastern District which has a projected population of 38,166 (projected in 2011, noting that these have since been identified as ambitious targets) and identifies the Hindmarsh location for a new regional and district level community facilities, reflective of the anticipated focus for this location for population growth.

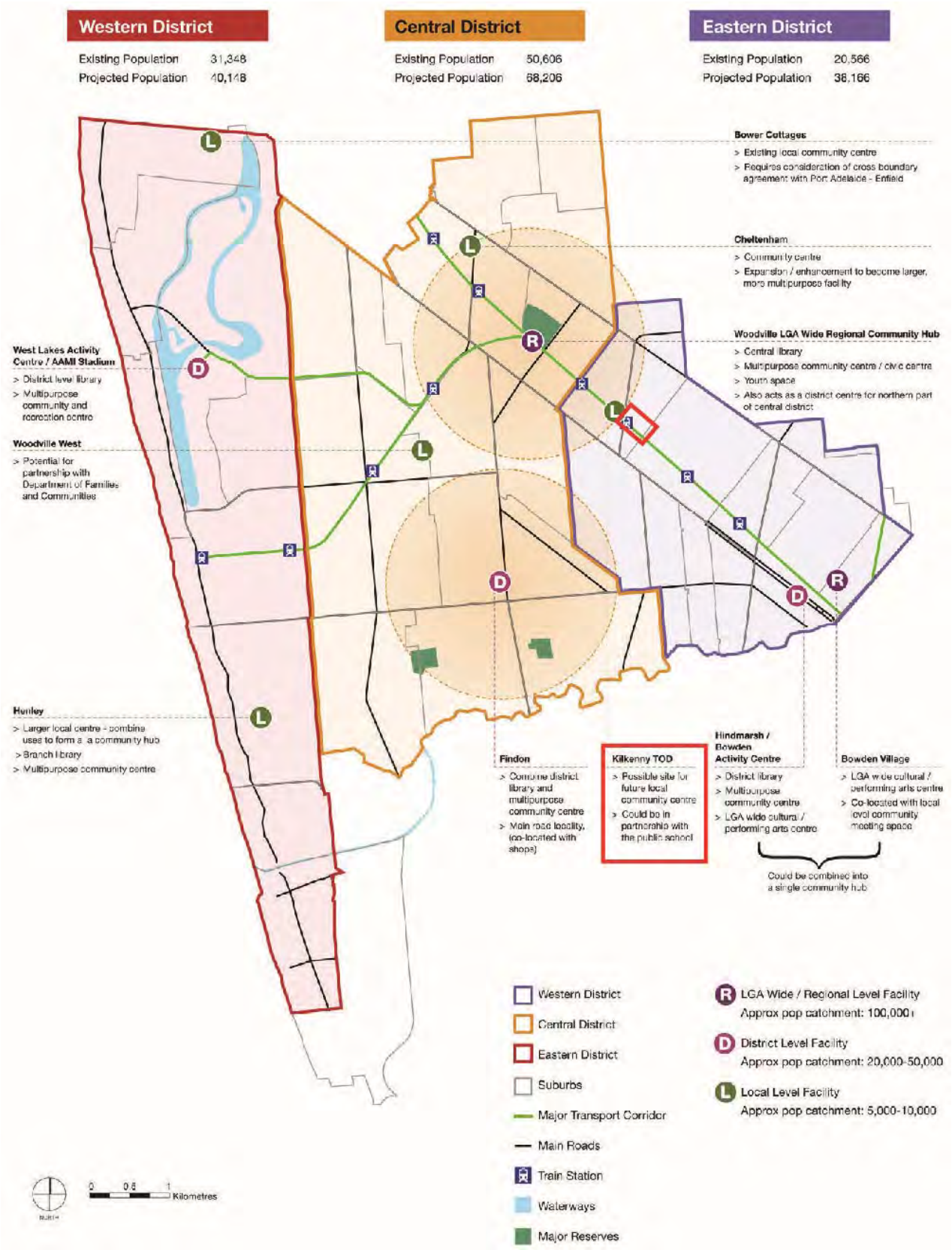


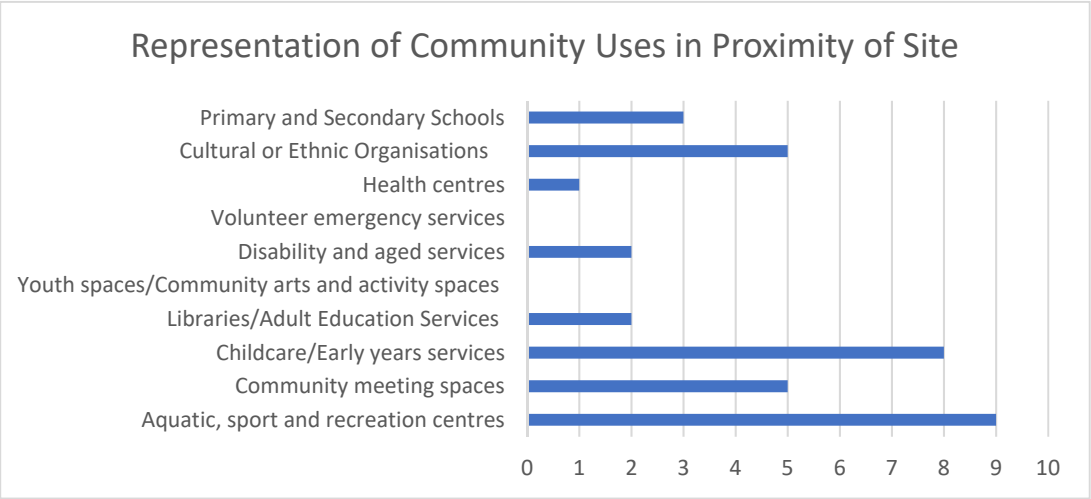
Figure 17: Community Facilities Spatial Plan

The affected area is also identified as being on the periphery of the Woodville Regional Community Hub located on Woodville Road, Woodville. This centre provides services such as a central library, multipurpose

community centre/civic centre, St Clair Recreation Centre, Queen Elizabeth Hospital, youth space and is accessible to the affected area, being only two stops away along the Adelaide – Outer Harbour rail line.

The spatial plan also identifies the affected area as the "Kilkenny TOD" and a potential future site for a local community centre, potentially in partnership with the Kilkenny Primary School. A connection between future community infrastructure in the affected area and Kilkenny Primary is limited due to the nature of physical separation by the railway and the O-I facility. Nevertheless, the identification of the site as a potential local centre for community infrastructure supports the creation of a policy framework which encourages these types of uses within the mixed use components of future development of the land.

An analysis of existing community uses in proximity to the Affected Area has been undertaken. Existing community uses within a 2.0-kilometre radius of the Affected Area have been identified. Religion based facilities have not been considered here but are also highly prevalent within the study area and can serve similar social functions to community infrastructure. The following table represents the composition of community infrastructure within proximity of the affected area.



It is evident there is a wide spectrum of community facilities available within proximity of the Affected Area. The highest proportion of these are community sport facilities and childcare services. Evidently, there is a low representation of volunteer emergency services, and youth and community art spaces. It is considered that the need for volunteer emergency services in an urbanised area such as this is low, as the area is well serviced by public emergency services. It is noted that the MJ McInerney Reserve upgrade provides significant contribution to youth focused community infrastructure within the locality, including the addition of a basketball court and a skate park.

Implications for Policy

The policy response for the affected area should provide for a range of smaller scale retail and commercial activities to occur. It is important that a cap on retail floorspace is reflected within the policy, along with limitations on bulky goods outlets to ensure that retail and commercial land uses are small in scale and service the day-to-day retail needs of the community.

The affected area is well serviced by a range of existing community uses. Nevertheless, it is considered appropriate for the policy framework to envisage and facilitate a range of non-residential community land uses which serve the local population.

3.2.10 Potential Zone Review

The future zoning for the Affected Area will need to support medium to high density residential use, and small scale, ground floor retail use that serves the community. There are a number of potential zones

already within the Charles Sturt Council Development Plan which may accommodate the envisaged development scenario, these include:

_ Residential Zone
_ Mixed-Use Zone
_ Suburban Activity Node Zone
_ Urban Core Zone

The South Australian Planning Policy Library also provides a number of other potential zoning options which may be suitable, including:

_ Residential High-Density Zone
_ Residential Neighbourhood Zone
_ Urban Corridor Zone

However, it is considered desirable that, if possible, the DPA establishes a zone for the Affected Area which is already recognised within the Charles Sturt Council Development Plan and as such these zones would only be considered if an appropriate zone does not exist within the Development Plan.

Residential Zone

The Residential Zone is the standard policy framework applied to the vast majority of the residential areas within the Charles Sturt Council area. The policy framework provides for dwellings or a range of types and forms. Generally, higher densities and taller residential development is limited to certain areas within the Zone. These should be located on larger sites in proximity to larger open spaces or high traffic volume roads.

The Zone's primary focus is on accommodating residential development and ancillary uses, however non-residential development is permitted where it is of a small-scale and serves the local community.

To achieve the intended development scenario of the DPA under the Residential Zone policy framework it would be necessary to establish a Policy Area for the site which better identifies the more intense form and scale of development envisaged. Currently the Residential Zone has nine operating Policy Areas, as follows:

- Inner Suburban Policy Area 15
- Mid Suburban Policy Area 16
- Western Edge Policy Area 17
- West Lakes General Policy Area 17
- West Lakes Medium Density Policy Area 20
- Integrated Medium Density Policy Area 20
- Woodville Medium Density Policy Area 21
- Cheltenham Park Policy Area 22
- Woodville West Policy Area 23

Policy Area's which may support the intended development scenario include Policy Area 20 and Policy Area 23. There are however limitations with these options, including building height restrictions and location specific policy. Additionally, the non-complying list for the Zone would restrict a number of suitable forms of development within the affected area, specifically in relation to floor area sizes for shops and non-residential uses. A number of additional exemptions to the non-complying list would be required for the new Policy Area.

Mixed-Use Zone

The policies of the Mixed-Use Zone provide for a mix of commercial uses along with some residential use. A range of uses are envisaged in the zone including service uses, offices, commercial, motor trade, wholesaling, showrooms and medium density residential development. It is envisaged that the area will also accommodate low impact industrial activities that do not create any nuisance and have minimal off-site impact.

The Zone is not considered the most suitable policy outcome for the intended development scenario. The Mixed-Use Zone is focused primarily on non-residential forms of development with residential as a secondary component. Additionally, the policies of the Zone speak to medium density residential development but not at the densities of heights envisaged for the affected area.

Urban Core Zone

The Urban Core Zone provides for medium and high-density residential use along with other employment generating land-uses. It is the highest order growth zone available and is currently applied to Bowden and West Lakes (West) – both larger scale masterplanned development precincts. Depending on the location within the Zone a range of uses are envisaged including residential, commercial, shops, community uses, educational and light industry in some circumstances.

Rather than the residential component being supported by suitable non-residential uses, this zone focuses on a more mixed-use arrangement with neither land use taking precedence over the other. Core areas within this Zone are envisaged to accommodate light industrial and commercial development (including high technology and research-based activities). The scale and densities of development envisaged within the zone (over 70 dwellings per hectare) are also greater than those envisaged for the affected area.

It is considered that the range of activities and their nature that are permitted within the Urban Core Zone is too broad for the proposed development scenario. Additionally, it is intended that the affected area is developed with its primary function to be residential use supported by suitable non-residential activity. It is not considered that the Urban Core Zone provides suitable policy coverage to steer future development in this direction and is not appropriate for the context of the affected area.

Suburban Activity Node Zone

The Suburban Activity Node Zone provides for a range of medium and high-density residential development supported by compatible land uses, with a focus of activity around a key focal point such as a fixed transit stop, centre, or open space. The focus of the Suburban Activity Node Zone is on higher density residential with other supporting uses. As such the context and role of the zone suits the affected area well.

Currently the Zone applies to one location within the Council Area at Seaton. The site shares many similarities to the affected area, including proximity to a railway station, former industrial use, interface with established low-density residential areas, and applies to an area of a similar scale. Additional policy guidance is provided for the Zone by the Concept Plan Map ChSt/30.

The Desired Character statement for the Zone accurately reflects and captures the intended post-development scenario that this DPA is intending to facilitate, in that the Zone provides a *"high density residential node with integrated mixed use development… around public transit stops… set within a wider suburban context and offers a focus for local community… designed to foster an area with sense of identity and uniqueness"*.

Additionally, the policy of the Suburban Activity Node Zone speaks to the focus of development around key focal points, such as open spaces and transit stations. This is highly applicable to the affected area given the presence of the adjacent Kilkenny Railway Station and MJ McInerney Reserve.

The Zone primarily accommodates higher density residential forms such as apartments, row dwellings, and residential flat buildings. The policies speak to a core area which will be the focus of greatest intensity in development, and transition areas which will act as a buffer to nearby lower density areas.

Building heights are limited within the core area to four storeys and three storeys within the transition area. This would require some adjustment for the affected area to accommodate the intended development scenario of buildings up to 5 storeys.

Implications for Policy

The intended development outcomes sought for the affected area, along with the policy directions sought as part of this DPA indicate that the Suburban Activity Node Zone is the most appropriate zone for the affected

area. Additional policy guidance will be required to apply specific policy to differentiate from the location of the zone at Seaton relating to:

- building heights
- retail floor areas
- the presence of heritage and historic character considerations
- key spatial elements such as the greenway, pedestrian connections, activated frontages and the creation of a plaza space.

4. Recommended Policy Changes

Following is a list of the recommended policy changes based on the investigations of this DPA:

- Rezone the affected are from the Urban Employment Zone (and two Residential Character Zone properties) to the Suburban Activity Node Zone

- Provide additional policy amendments (through additions and amendments to the Desired Character Statement and Principles of Development Control) within the Suburban Activity Node Zone which addresses:

  - Identification of Core and Transition area locations specific to Kilkenny
  - Confirmation of desired maximum building heights of 5 storeys within the core area and 3 storeys within the transition areas
  - Limiting building heights to 2 storeys within 9.5 metres of the Mundulla Street frontage (to respond to historic character interface)
  - Provision of specific criteria guiding side setbacks within the Historic Conservation Area
  - Limiting non-residential development from Mundulla Street frontage
  - Identifying and differentiating maximum retail floor areas for the transition area from those applying to Seaton
  - Identification of desired activated frontages along Kilkenny Terrace and Wilpena Terrace
  - Identification of the O-I Glass plant, rail line and David Terrace as key noise sources from which residential development needs to mitigate impacts
  - Identification of the presence of the Historic Conservation Area and local heritage place within the zone and the need for development to respond to these
  - Provision of a public plaza adjacent the rail station
  - Provision of pedestrian connections to Arkaba Road and MJ McInerney Reserve
  - Ensuring development makes space for the Outer Harbor Greenway along the rail corridor.

- Application of the Noise and Air Emissions Overlay to the affected area

- Application of the Affordable Housing Overlay to the affected area

- Mapping amendments to reflect the zoning and Overlay application changes.

5. Consistency with the Residential Code

The Residential Development Code was introduced in 2009 to make simpler, faster and cheaper planning and building approvals for home construction and renovation.

The affected area is not subject to the Residential Code provisions and therefore this DPA has no implications for the Development Regulations, 2008.

6. Statement of statutory compliance

Section 25 of the *Development Act 1993* prescribes that the DPA must assess the extent to which the proposed amendment:

- accords with the Planning Strategy
- accords with the Statement of Intent
- accords with other parts of council's Development Plan
- complements the policies in Development Plans for adjoining areas
- accords with relevant infrastructure planning
- satisfies the requirements prescribed by the Development Regulations 2008.

6.1 Accords with the Planning Strategy

Relevant strategies from the Planning Strategy are summarised in the Appendices of this document. This DPA is consistent with the direction of the Planning Strategy.

6.2 Accords with the Statement of Intent

The DPA has been prepared in accordance with the Statement of Intent agreed to on 17 October 2018. In particular, the proposed investigations outlined in the Statement of Intent have been have been addressed in section 3.2 of this document.

6.3 Accords with other parts of the Development Plan

The policies proposed in this DPA are consistent with the format, content and structure of the Charles Sturt Council Development Plan.

For instance, the proposed zone adopted is within the Development Plan already and the amendments aid in differentiating elements that apply to the different locations applying to the zone. The DPA also utilises existing General and Overlay policies, as well as Tables.

6.4 Complements the policies in the Development Plans for adjoining areas

The DPA applies to a specific area located centrally within the Charles Sturt Development Plan. The policy approach adopted for this location, by reflecting the strategic direction for the 30 Year Plan for Greater Adelaide, reflects those for other Council Development Plans within the inner rim of Adelaide which supports mixed use and higher density residential development adjacent transit stations and high frequency corridors. The DPA utilises a Core SAPPL zone and only applies local addition policies specific to the location and context.

Accordingly, the policies proposed in this DPA will not affect and will complement the policies of Development Plans for adjoining areas.

6.5 Accords with relevant infrastructure planning

This DPA complements current infrastructure planning for the Council area, as discussed in section 2.3.3 of this document.

6.6 Satisfies the requirements prescribed by the Regulations

The requirements for public consultation (Regulation 11) and the public meeting (Regulation 12) associated with this DPA will be met.

References/Bibliography

- **BEST PRACTICE OPEN SPACE IN HIGH DENSITY DEVELOPMENTS PROJECT,** Suter Planners et al, 2011
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- **INTEGRATED TRANSPORT AND LAND USE PLAN**, Government of South Australia, 2015
- **O-I ADELAIDE PLANT AIR QUALITY IMPACT ASSESSMENT,** Enviroscan, 2018
- **PLANNING FOR SOCIAL INFRASTRUCTURE AND COMMUNITY SERVICES FOR URBAN GROWTH AREAS – SERVICE PLANNING MODEL,** Elton Consulting, 2011
- **SEATON AND KILKENNY TOD SCOPING STUDY**, Parsons Brickenhoff Australia, 2009
- **SOUTH AUSTRALIAN PLANNING POLICY LIBRARY – VERSION 6**, Government of South Australia, 2011
- **STATE PLANNING POLICIES FOR SOUTH AUSTRALIA**, Government of South Australia, 2019
- **CITY OF CHARLES STURT STRATEGIC DIRECTIONS REPORT**, City of Charles Sturt, 2014
- **THE 30-YEAR PLAN FOR GREATER ADELAIDE 2017**, Department of Planning, Transport and Infrastructure, Government of South Australia 2017
- **WILPENA TERRACE, KILKENNY DEVELOPMENT PLAN AMENDMENT TRANSPORT IMPACT ASSESSMENT**, GTA Consultants, March 2018
- **KILKENNY DPA ENVIRONMENTAL NOISE ASSESSMENT**, Sonus, May 2019

Schedule 4a Certificate

CERTIFICATION BY COUNCIL'S CHIEF EXECUTIVE OFFICER

DEVELOPMENT REGULATIONS 2008

SCHEDULE 4A

Development Act 1993 – Section 25 (10) – Certificate - Public Consultation

CERTIFICATE OF CHIEF EXECUTIVE OFFICER THAT A
DEVELOPMENT PLAN AMENDMENT (DPA) IS SUITABLE FOR THE PURPOSES OF PUBLIC CONSULTATION

I Paul Sutton, as Chief Executive Officer of the City of Charles Sturt, certify that the Statement of Investigations, accompanying this DPA, sets out the extent to which the proposed amendment or amendments-

(a) accord with the Statement of Intent (as agreed between the City of Charles Sturt and the Minister under section 25(1) of the Act) and, in particular, all of the items set out in Regulation 9 of the *Development Regulations 2008*; and

(b) accord with the Planning Strategy, on the basis that each relevant provision of the Planning Strategy that related to the amendment or amendment has been specifically identified and addressed, including by an assessment of the impacts of each policy reflected in the amendment or amendments against the Planning Strategy, and on the basis that any policy which does not fully or in part accord with the Planning Strategy has been specifically identified and an explanation setting out the reason or reasons for the departure from the Planning Strategy has been included in the Statement of Investigation; and

(c) accord with the other parts of the Development Plan (being those parts not affected by the amendment or amendments); and

(d) complement the policies in the Development Plans for adjoining areas; and

(e) satisfy the other matters (if any) prescribed under section 25(10)(e) of the *Development Act 1993*.

The following person or persons have provided advice to the council for the purposes of section 25(4) of the Act:

Jim Gronthos

DATED this 20 day of 1 2020

.....

Paul Sutton
Chief Executive Officer
City of Charles Sturt

Appendices

Appendix A - Assessment of the Planning Strategy

Appendix B – Transport Impact Assessment, GTA Consultants

Appendix C – Environmental Noise Assessment, Sonus

Appendix D – Infrastructure assessment, KBR

Appendix A - Assessment of the Planning Strategy

Target	How the DPA will implement the target
85% of all new housing in metropolitan Adelaide built in established urban areas by 2045	The DPA seeks to rezone land that can support the development of new housing in an established urban area of Adelaide, and this is therefore consistent with assisting in the achievement of this target.
60% of all new housing in metropolitan Adelaide is built within close proximity to current and proposed fixed line (rail/ tram/ O-Bahn) and high frequency bus routes by 2045	The DPA seeks to rezone land that can support future housing and is located in close proximity (and with direct pedestrian connection) to established public transport routes, including the Kilkenny Railway Station and bus routes on Port Road (high frequency) and David Terrace.
Increase the percentage of residents living in walkable neighbourhoods in Inner, Middle and Outer Metropolitan Adelaide by 25% by 2045	The DPA considers principles associated with walkable neighbourhoods and seeks to create housing and employment opportunities in close proximity to other existing land uses, infrastructure and services that promote walkability. Legibility and connectivity to neighbouring communities and facilities are central to these principles.
Urban green cover is increased by 20% in metropolitan Adelaide by 2045	The DPA examines opportunities for the integration of urban greening through the provision of public open space and green space on key development sites and locations, particularly the relationship of existing adjacent open spaces to the sites.
Increasing housing choice by 25% to meet changing household needs in Greater Adelaide by 2045	The DPA considers how greater housing choice can be achieved as part of a new residential development within a key site, particularly the range of existing zoning policy available within the Development Plan that supports diversity of housing types and sizes. This is balanced against the need and desire, as well as the appropriateness of, denser housing products such as apartments relative to their (convenient) accessibility to services, employment and facilities.

Policy	How the policy will be implemented:
Principles of the Plan	
Principle 1: A compact and carbon-neutral city	Providing additional housing opportunities at increased densities which can be adequately serviced by infrastructure such as public transport within the footprint of the existing metropolitan area.
Principle 2: Housing diversity and choice	
Principle 3: Accessibility	Providing policy to encourage permeability between adjoining residential areas and transport connections.
Principle 4: A transit-focused and connected city	Providing additional housing opportunities in close proximity to public transport with good pedestrian connectivity.
Principle 8: Healthy, safe and connected communities	Providing policy to encourage permeability between adjoining residential areas and open space.

Policy	How the policy will be implemented:
	Providing policy which encourages walking and use of active transit options Integrating Crime Prevention Through Environmental Design (CPTED) principles into policy Establishing policy that ensures newly developed areas are well integrated with existing neighbourhood in their design, accessibility, and character.
Principle 9: Affordable living	The DPA proposes policy that envisages a mix of housing densities and types to suit a variety of households including affordable housing through the use of the South Australia Planning Module Library – Affordable Housing Overlay.
Our policy themes – Transit corridors, growth areas and activity centres	
Policy 1. *Deliver a more compact urban form by locating the majority of Greater Adelaide's urban growth within existing built-up areas by increasing density at strategic locations close to public transport. (Map 2)*	The DPA proposes to investigate an increase in residential density in close proximity to a Mass Transit Station (Outer Harbor railway line and Kilkenny Train Station) (refer to Map 2 – Activity centres and mass transit routes).
Policy 2*. Increase residential and mixed use development in the walking catchment of:* ▪ *Strategic activity centres* ▪ *Appropriate transit corridors* ▪ *Strategic railway stations.*	The DPA proposes to investigate a mixed use environment in close proximity to identified Mass Transit Station (Outer Harbor railway line and Kilkenny Train Station) (refer to Map 2 – Activity centres and mass transit routes).
Policy 3. *Increase average gross densities of development within activity centres and transit corridor catchments from 15 to 25 dwellings per hectare to 35 dwellings per hectare.*	The DPA proposes to investigate greater residential density in close proximity to identified Mass Transit Station (Outer Harbor railway line and Kilkenny Train Station) (refer to Map 2 – Activity centres and mass transit routes).
Policy 5. *Encourage medium rise development along key transport corridors, within activity centres and in urban renewal areas that support public transport use.*	
Policy 8. *Provide retail and other services outside designated activity centres where they will contribute to the principles of accessibility, a transit-focused and connected city. High quality urban design, and economic growth and competiveness.*	The DPA proposes to investigate policy that envisages mixed-use development including commercial land uses to service the proposed residential uses and provide potential employment opportunities.
Action 4. *Rezone strategic sites to unlock infill growth opportunities that directly support public transport infrastructure investment.*	The DPA proposes to investigate greater residential density in close proximity to identified Mass transit station (Outer Harbor railway line and Kilkenny Train Station) (refer to Map 2 – Activity centres and mass transit routes).
Our policy themes – Design quality	
Policy 29. *Encourage development that positively contributes to the public realm by ensuring compatibility with its surrounding context and provides active interfaces with streets and public open spaces.*	The draft DPA proposes to investigate the inclusion of policy to guide development within the investigation area with regard to design issues including, setbacks, building heights that can transition from nearby adjacent low density

Policy	How the policy will be implemented:
Action 16. *Ensure that the local area planning process adequately address interface issues in the local context and identify appropriate locations for:* ▪ *Medium and high rise buildings* ▪ *Where there should be minimum and maximum height limits.*	residential areas. Other issues which will be investigated include but not limited to desired pedestrian and vehicle access and consideration of public open space. The draft DPA will also investigate policy opportunities to encourage activation within the Affected Area along the existing road systems and take advantage of its accessibility with the adjacent proposed Outer harbor Greenway.
Our policy themes – Housing mix, affordability and competitiveness	
Policy 36. *Increase housing supply near jobs, services and public transport to improve affordability and provide opportunities for people to reduce their transport costs.*	The DPA proposes to investigate greater residential density in close proximity to identified Mass Transit Station (Outer Harbor railway line and Kilkenny Train Station) (refer to Map 2 – Activity centres and mass transit routes).
Policy 37. *Facilitate a diverse range of housing types and tenures (including affordable housing) through increased policy flexibility in residential and mixed-use areas…….*	It is anticipated that the investigation area will accommodate a mix of housing densities and types that complement the existing residential locality and maximise its location to proximity to identified Mass Transit Station (Outer Harbor railway line and Kilkenny Train Station) (refer to Map 2 – Activity centres and mass transit routes).
Policy 45. *Promote affordable housing in well located areas close to public transport and which offers a housing mix (type and tenure) and quality built form that is well integrated into the community.*	The DPA proposes to investigate policy that envisages mix of housing densities and types to suit a variety of households and investigate affordable housing through the use of the South Australia Planning Module Library – Affordable Housing Overlay.
Our policy themes – The economy and jobs	
Policy 56. *Ensure there are suitable land supplies for the retail, commercial and industrial sectors.*	The DPA proposes policy that envisages mix-use development including commercial land uses to service the proposed residential uses and provide potential employment opportunities.
Policy 73. *Provide sufficient strategic employment land options with direct access to major freight routes to support activities that require separation from housing and other sensitive land uses.*	The City of Charles Sturt Industrial Land Study, 2008 reviewed the future of industrial land within the Council area. Industrial areas were assessed against the Prime Industrial Area Assessment Matrix, developed from the Metropolitan Adelaide Industrial Land Study to determine their importance as ongoing industrial land. The areas were also assessed against a Rezoning Potential Assessment Matrix to determine their suitability to being rezoned to an alternative use. The recommendations and findings from the Study in related to the Affected Area will be considered as part of the DPA investigations.
Our policy themes – Transport	
Policy 76. *Improve the amenity and safety of public transport stops, stations and interchanges by improving their connections to adjacent development and encouraging mixed-use development and housing diversity in close proximity.*	The DPA proposes to investigate greater residential density in close proximity to a Mass Transit Station (Outer Harbor railway line and Kilkenny Train Station) (refer to Map 2 – Activity centres and mass transit routes).
Policy 78. *Improve, prioritise and extend walking and cycling infrastructure by providing safe, universally accessible and*	The Affected Area is adjacent to the proposed Outer Harbor Greenway and its integration to the site will be investigated.

Policy	How the policy will be implemented:
convenient connections to activity centres, open space and public transport (see Map 8)	
Our policy themes – Open space, sport and recreation	
Policy 104. *Investigate opportunities to increase the amount and/or quality of public open space provision in areas of low open space provision and areas of increasing population growth.*	Consideration on the need for public open space will be investigated including appropriate size and location to ensure visibility and accessibility to the broader locality. The draft DPA will also investigate policy opportunities to encourage activation within the Affected Area to take advantage of its accessibility with the adjacent proposed Outer Harbor Greenway.
Our policy themes – Climate change	
Policy 105. *Deliver a more compact urban form to:* *Reduce vehicle travel and associated greenhouse gas emissions.*	The DPA proposes to facilitate a higher density housing form within the Affected Area that will result in a more efficient development footprint. The site's location adjacent to an identified Mass Transit Mass Transit Station (Outer Harbor railway line and Kilkenny Train Station) (refer to Map 2 – Activity centres and mass transit routes)and the proposed Outer Harbor Greenway provides an alternative to car dependency.
Policy 111. *Create a more liveable urban environment through establishing a network of greenways, bicycle boulevards and tree-lined streets.*	
Our policy themes – Water	
Policy 117. *Increase the provision of stormwater infrastructure (including water sensitive urban design) to manage and reduce the impacts of:* *Run-off from infill development*	The DPA proposes to investigate stormwater management to inform the preparation of policies including the consideration of stormwater management systems and Water Sensitive Urban Design Techniques for future development proposals specific to the Affected Area.
Our policy themes – Emergency management and hazard avoidance	
Policy 121. *Ensure risk posed by known or potential contamination of sites is adequately managed to enable appropriate development and safe use of the land.*	The DPA proposes to undertake environmental investigations to identify any potentially contaminating activities to inform the preparation of policy to acknowledge potential requirements relating to site contamination investigations and remediation.

Appendix B – Transport Impact Assessment, GTA

Wilpena Terrace, Kilkenny

Development Plan Amendment
Transport Impact Assessment

Prepared by: GTA Consultants (SA) Pty Ltd for Jensen Plus

on 22/07/19

Reference: S163870

Issue #: C

GTAconsultants

Wilpena Terrace, Kilkenny

Development Plan Amendment
Transport Impact Assessment

Client: Jensen Plus

on 22/07/19

Reference: S163870

Issue #: C

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	25/06/19	Final	Lydia Kairl	Paul Froggatt	Paul Froggatt	PF
B	15/07/19	Final – amended	Lydia Kairl	Paul Froggatt	Paul Froggatt	PF
C	22/07/19	Final -amended	Lydia Kairl	Paul Froggatt	Paul Froggatt	

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1. INTRODUCTION

A Development Plan Amendment is currently being prepared for a proposed rezoning of land within the area of Kilkenny from Urban Employment (Development Category: Industrial) to Residential.

01

1.1. Background

A Development Plan Amendment is currently being prepared for a proposed rezoning of land within the suburb of Kilkenny. The land is currently zoned Urban Employment (Development Category: Industrial), with a small section of Residential Character, there is a desire to rezone the land to mixed use for future residential and commercial development.

GTA Consultants was commissioned to undertake a transport impact assessment of the potential development.

1.2. Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the potential development under the proposed rezoning, including consideration of the following:

1. Existing traffic and parking conditions surrounding the site
2. The road hierarchy within the site
3. Local walking, cycling and public transport facilities close to the site
4. Traffic generation characteristics of the potential development
5. Potential access arrangements for the site
6. Transport impact of the development proposal on the surrounding road network.

1.3. References

In preparing this report, reference has been made to the following:

- Charles Sturt Council Development Plan (consolidated 13 September 2018)
- Concept plans for the potential development
- Kilkenny Mixed Use (Residential and Commercial) DPA Statement of Intent (dated July 2018)
- Traffic and car parking surveys undertaken by GTA Consultants as referenced in the context of this report
- Various technical data as referenced in this report
- An inspection of the site and its surrounds
- Other documents as nominated.

2. EXISTING CONDITIONS

The subject site is located in Kilkenny, on the northern edge of an Industrial area adjacent the Kilkenny Railway Station, approximately 8 kms from the Adelaide CBD. The Development Plan Amendment proposes to rezone the subject area to encourage mixed use development and medium to high density residential land uses and commercial opportunities to make better use of the site's location in close proximity to the existing Kilkenny Railway Station, public open space and the Adelaide CBD.

02

2.1. Subject Site

The subject site is located in Kilkenny, on the northern edge of an Industrial area adjacent the Kilkenny Railway Station, approximately 8 kms from the Adelaide CBD. The Development Plan Amendment proposes to rezone the subject area to encourage mixed use development and medium to high density residential land uses and commercial opportunities to make better use of the site's location in close proximity to the existing Kilkenny Railway Station, public open space and the Adelaide CBD.

The site has a total area of approximately 3.5 hectares. The site is predominantly industrial buildings and bitumen, with Bianco operating on the site until some 10 years ago.

The site is surrounded by residential dwellings to the north and west, public open space to the east, and industry uses to the south.

The location of the subject site and the surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject Site and its Environs

(PhotoMap adapted from NearMap Pty Ltd)

2.2. Road Network

2.2.1. Adjoining Roads

David Terrace

David Terrace is an arterial road under the car and control of the Department for Transport Planning and Infrastructure (DPTI). It is a two-way road aligned in an approximately north to south direction. It is configured with one vehicle lane and one bicycle lane in each direction. The approximately 12-metre-wide carriageway is set within an approximately 20-metre-wide road reserve. A parking lane is indented on either side of the carriageway near the subject site, with parking subject to time restrictions.

David Terrace is subject to a posted speed limit of 60km/h and carries approximately 19,900 vehicles per day[1].

Pinda Street

Pinda Street is a local road under the care and control of Council. It is a no-through road at its southern end, with no vehicle access across MJ McInerney Reserve. It is a two-way road with an approximately 7.9-metre-wide carriageway set within an approximately 11-metre-wide road reserve.

Kerbside parking is permitted on either side of the carriageway, although parking on both sides of the road would limit through traffic to a single lane in the centre of the road. At the eastern end adjacent the reserve some 90° indented parking is provided.

Pinda Street is subject to an area speed limit of 40km/h and carries around 480 vehicles per day (2010)[2].

Wilpena Terrace

Wilpena Terrace is a local road aligned in an approximately northeast-southwest direction. The section of Wilpena Terrace located within the study area is part of an existing bicycle route. Wilpena Terrace between David Terrace and Pinda Street is closed to through vehicles, with the intersection of Wilpena Terrace and David Terrace providing a bicycle only link. This link was put in place in 2014, and prior to that this junction allowed vehicles to exit onto David Terrace (with no entry permitted). The future greenway bicycle route along the trainline will alter this arrangement, although it is understood this intersection will not allow through traffic between David Terrace and Pinda Street.

Wilpena Terrace is subject to an area speed limit of 40km/h and carries around 980 vehicles per day north of Penola Street (2016)[2]. Kerbside parking is permitted. To the north of Pinda Street 45° indented parking is provided on the northwest side of the carriageway.

Arkaba Road

Arkaba Road is a local road under the care and control of Council. It is a two-way road with an approximately 6.6-metre-wide carriageway set within an approximately 12-metre-wide road reserve.

Kerbside parking is permitted on either side of the carriageway, although parking on both sides of the road would limit through traffic to a single lane in the centre of the road.

Arkaba Road is subject to an area speed limit of 40km/h and carries around 620 vehicles per day (2010)[2].

Mundulla Street

Mundulla Street is a local road under the care and control of Council. It is a two-way road with an approximately 6.8-metre-wide carriageway set within an approximately 12-metre-wide road reserve. Kerbside parking is permitted on either side of

[1] Based on DPTI data dated 2014 accessed through LocationSA (http://location.sa.gov.au)
[2] Based on traffic data provided by Council

the carriageway, although parking on both sides of the road would limit through traffic to a single lane in the centre of the road.

Mundulla Street is subject to an area speed limit of 40km/h and carries around 370 vehicles per day east of Wilpena Terrace (2010) and around 520 vehicles per day between Wilpena Terrace and David Terrace (2016) [2].

At the intersection of Mundulla Street and David Terrace a channelised right turn lane is available.

2.2.2. Surrounding Intersections

The following intersections currently exist in the vicinity of the site:

- David Terrace/Wilpena Terrace (bicycle access only)
- David Terrace/Pinda Street (unsignalised)
- Pinda Street/Wilpena Terrace (unsignalised)
- David Terrace/Mundulla Street (unsignalised, channelised right turn lane)
- Mundulla Street/Wilpena Terrace (unsignalised)
- Mundulla Street/Arkaba Road (unsignalised)
- Mundulla Street/Aroona Road (unsignalised)
- Arkaba Road/Pinda Street (unsignalised).

2.2.3. Traffic Volumes

GTA Consultants has obtained traffic volume counts on key roads in the vicinity of the site from Council. The daily traffic volumes provided are shown in Figure 2.2, including two counts conducted post the road closure of the Wilpena Terrace/ David Terrace intersection.

Figure 2.2: Available Daily Traffic Volume Data

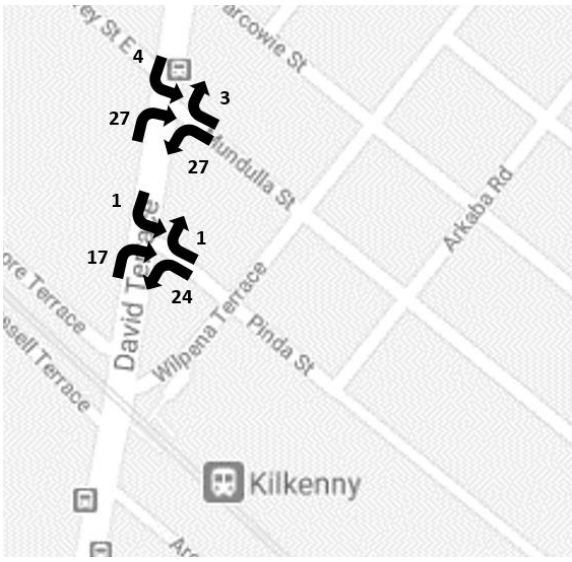
Based on the above it can be deduced that a large portion of the 600 vehicles per day recorded on Wilpena Terrace in 2013 would be rerouted through Pinda Street and Mundulla Street to access David Terrace. 2016 counts indicate around a 200 vehicle per day increase on Mundulla Street since the road closure. As such it would be reasonable to assume in the order of 300 vehicles per day would have rerouted to Pinda Street between Wilpena Terrace and David Terrace due to the closure. This would bring this road segment to around 630 vehicles per day. Based on these assumptions Figure 2.3 summarises the estimated daily traffic volumes based on the available traffic data.

Figure 2.3: Estimated Pre-development Daily Traffic Volumes

In addition, GTA has conducted turning movement counts on David Terrace at the intersections with Mundulla Street and Pinda Street during the PM peak period. Surveys were conducted on Thursday 14 March 2019 between 4:30pm and 6:00pm. The peak period recorded was 4:45pm to 5:45pm.

The turning movements recorded in this peak period are shown on Figure 2.4.

Figure 2.4: PM Peak hour (4:45-5:45pm) turning movements David Terrace with Mundulla Street and Pinda Street



Intersection Performance

GTA has modelled these two intersections in SIDRA Intersection in the PM peak period based on the volumes outlined in Figure 2.4 (above). Based on these volumes, Figure 2.5 and Figure 2.6 show the modelled intersection performance at these two interserctions.

Figure 2.5: David Terrace/Pinda Street Intersection Movement Summary – PM Peak

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: David Terrace											
2	T1	857	5.0	0.474	0.5	LOS A	0.6	4.6	0.08	0.01	59.2
3	R2	18	0.0	0.474	14.7	LOS B	0.6	4.6	0.08	0.01	53.2
Approach		875	4.9	0.474	0.8	NA	0.6	4.6	0.08	0.01	59.1
East: Pinda Street											
4	L2	25	0.0	0.049	9.1	LOS A	0.2	1.1	0.66	0.82	46.4
6	R2	1	0.0	0.049	29.5	LOS D	0.2	1.1	0.66	0.82	46.1
Approach		26	0.0	0.049	9.9	LOS A	0.2	1.1	0.66	0.82	46.4
North: David Terrace											
7	L2	1	0.0	0.406	5.6	LOS A	0.0	0.0	0.00	0.00	58.3
8	T1	813	5.0	0.406	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		814	5.0	0.406	0.1	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		1715	4.9	0.474	0.6	NA	0.6	4.6	0.05	0.02	59.2

Figure 2.6: David Terrace/Mundulla Street Intersection Movement Summary – PM Peak

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: David Terrace											
2	T1	857	5.0	0.444	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
3	R2	28	0.0	0.042	9.9	LOS A	0.1	1.0	0.64	0.80	46.7
Approach		885	4.8	0.444	0.4	NA	0.1	1.0	0.02	0.03	59.3
East: Mundulla Street											
4	L2	28	0.0	0.083	9.0	LOS A	0.3	1.9	0.73	0.87	44.7
6	R2	3	0.0	0.083	48.3	LOS E	0.3	1.9	0.73	0.87	44.4
Approach		32	0.0	0.083	13.0	LOS B	0.3	1.9	0.73	0.87	44.7
North: David Terrace											
7	L2	4	0.0	0.426	5.6	LOS A	0.0	0.0	0.00	0.00	58.2
8	T1	813	5.0	0.426	0.1	LOS A	0.0	0.0	0.00	0.00	59.8
Approach		817	5.0	0.426	0.1	NA	0.0	0.0	0.00	0.00	59.6
All Vehicles		1734	4.8	0.444	0.5	NA	0.3	1.9	0.02	0.03	59.2

The above results show that the existing intersections operate well, with minimal queues and delays. It is noted that SIDRA modelling does not represent the platooning and queuing on David Terrace caused by the signalised crossings. As such the delays for the right turns out estimated by SIDRA are noticably higher than those observed on site, given the gaps created by the level crossing and associated greenway crossing signals.

2.2.4. Crash History

The reported crash history for the roads and intersections adjoining the subject site has been sourced from the South Australian Government Data Directory (Data SA).

A summary of the crashes for the last available five-year period (2013-2017) is presented in Figure 2.7.

Figure 2.7: Crash History (2013-2017)

Key crash issues to note include:

- A number of rear end crashes along David Terrace between the level crossing and Mundulla Street, including at the Pinda Street intersection;
  - Between Belmore Terrace and Pinda Street all midblock Rear End crashes (4) were southbound with at least one vehicle indicated as "stopped on carriageway" suggesting these were related to queues at the level crossing.
  - At the Pinda Street intersection both Rear End crashes (2) were northbound, indicating they may have been a vehicle waiting to turn right into Pinda Street that was rear ended. Of these two crashes one was recorded as due to inattention and the other was a DUI (Driver Under the Influence).
  - Between Pinda Street and Mundulla Street 3 Rear End crashes were recorded, with 2 involving southbound vehicles, and one involving a northbound vehicle, which may have been in the right turn lane, although the available data cannot certify this.
- Right angle crashes associated with turning movements around the Mundulla Street intersection with David Terrace;
  - Of the 5 Right Angle crashes recorded at the Mundulla Street/Harvey Street intersection with David Terrace all were related to vehicles exiting the Harvey Street intersection to travel south on David Terrace. None were associated with drivers turning right from Mundulla Street. As the subject site will not add additional turning movements to Harvey Street the subject site's development should not exacerbate any existing safety issues at this intersection
- A crash cluster at the Mundulla Street/Wilpena Terrace intersection associated with right turn movements;
  - Of these three recorded Right Angle crashes only one resulted in injuries. All of these Right Angle crashes involved a south-eastbound vehicle disobeying the give way sign at the intersection with Wilpena Terrace.

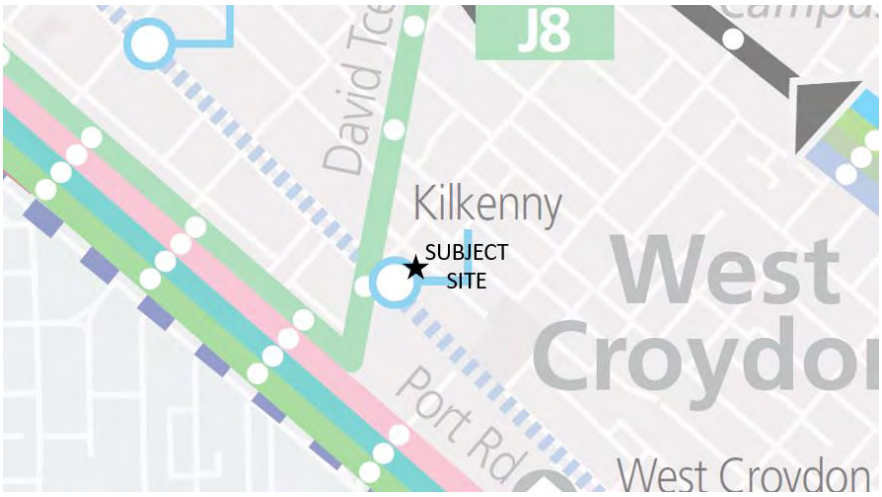
- Council has indicated resident correspondence relating to safety concerns at this intersection, with anecdotal and additional unreported crash history noted.

2.3. Sustainable Transport Infrastructure

2.3.1. Public Transport

Figure 2.8 shows the subject site in relation to existing public transport routes within its vicinity.

Figure 2.8: Public Transport Map



There is a bus stop located on David Terrace approximately 100m south of Wilpena Terrace, which is serviced by route J8. Route J8 services Marion, West Lakes, Arndale Centre, Queen Elizabeth Hospital and Adelaide Airport with services only running on weekdays.

In addition to road based public transport, Kilkenny rail station on the Outer Harbour & Grange line is located immediately adjacent the subject site. This station provides services to Adelaide CBD, Outer Harbour, Grange and locations in between.

2.3.2. Pedestrian Infrastructure

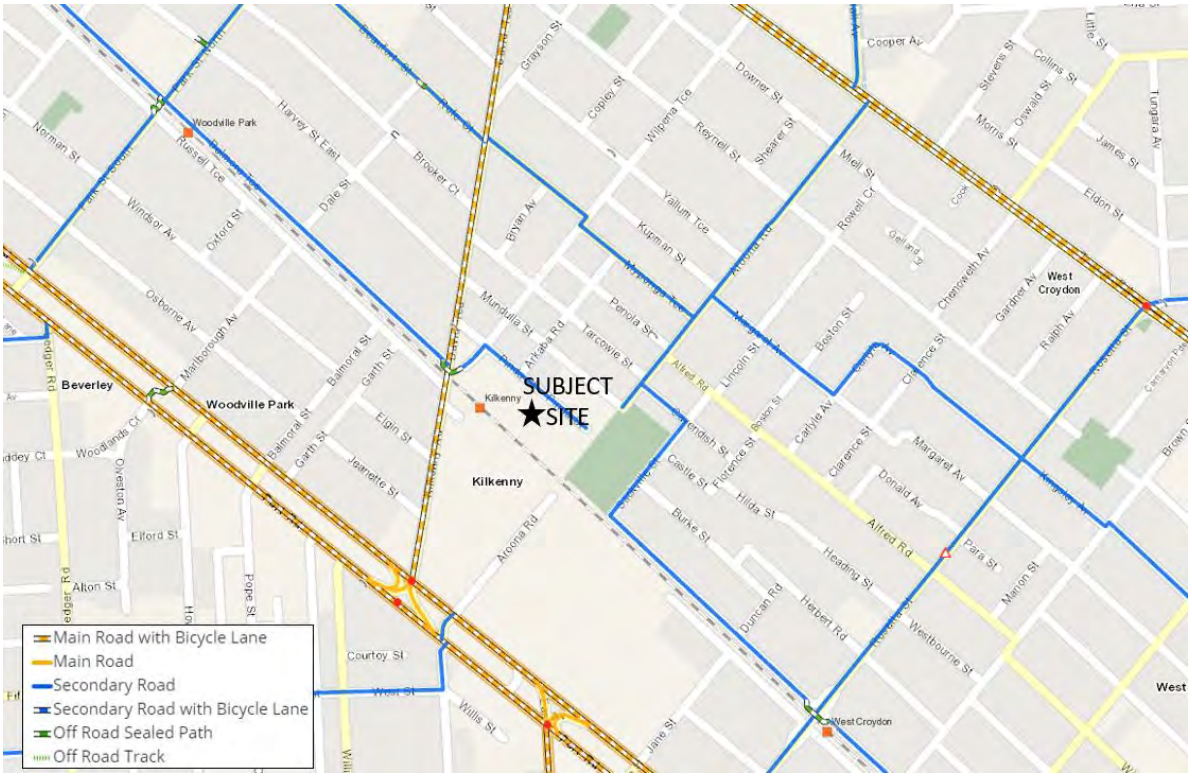
Sealed pedestrian paths are generally located on both side of the roads within the vicinity of the subject site, with the exception of Pinda Street, which through the area included within the DPA has only a sealed footpath on the northern side of the carriageway.

A pedestrian maze crossing across the railway line is located on the east side of David Terrace, to the west of the Kilkenny Railway Station.

2.3.3. Cycle Infrastructure

Cycle paths/routes in the vicinity of the subject site included in the Bike Direct network are located as shown in Figure 2.9.

Figure 2.9: Bike Direct Network



Source: https://maps.sa.gov.au//cycleinstead/

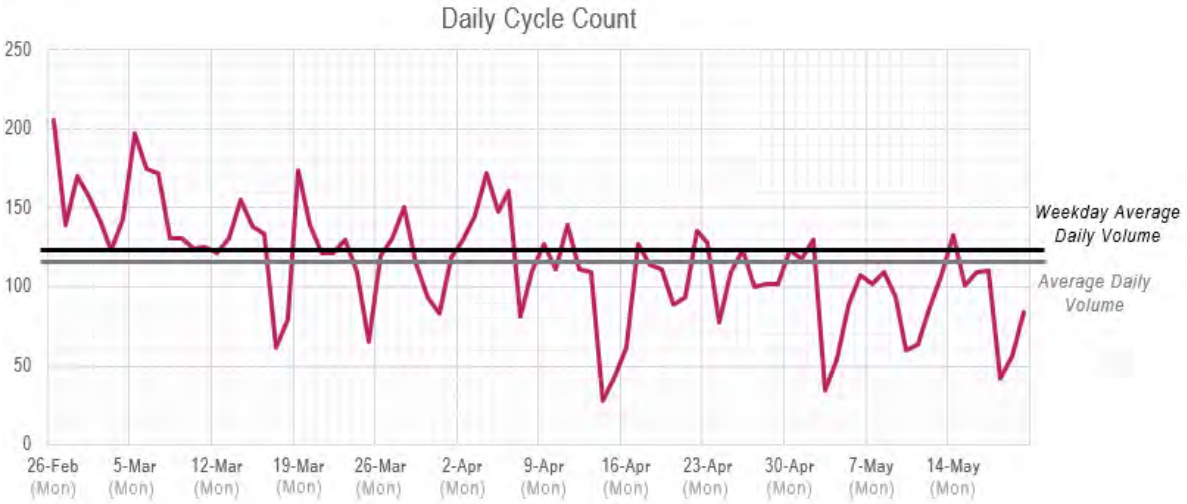
The existing Outer Harbor Greenway bicycle route along the railway corridor alignment uses local secondary roads to provide a route through the subject site. Wilpena Terrace, Pinda Street, MJ McInerney Reserve and Sackville Street form part of the route that deviates from the railway corridor. Continuation of the Greenway alignment along the rail corridor will require consideration as part of the DPA, with the approximate future alignment shown in Figure 2.10.

Figure 2.10: Future Greenway

2.3.4. Bicycle Counts

Council undertook bicycle counts in February through to May 2018 in the MJ McInerney Reserve, with Figure 2.11 showing the results of these counts.

Figure 2.11: Bicycle Volumes



The average daily volume recorded was 115 cyclists per day, while the 5-day (weekday) average for the period was 123 cyclists per day. The lower volume days typically corrosponded with weekends, and may also relate to the weather, with a trend towards lower volumes further into autumn.

3. DEVELOPMENT PROPOSAL

The Development Plan Amendment proposes to rezone the subject land from its former industrial land uses to allow for residential dwellings.

03

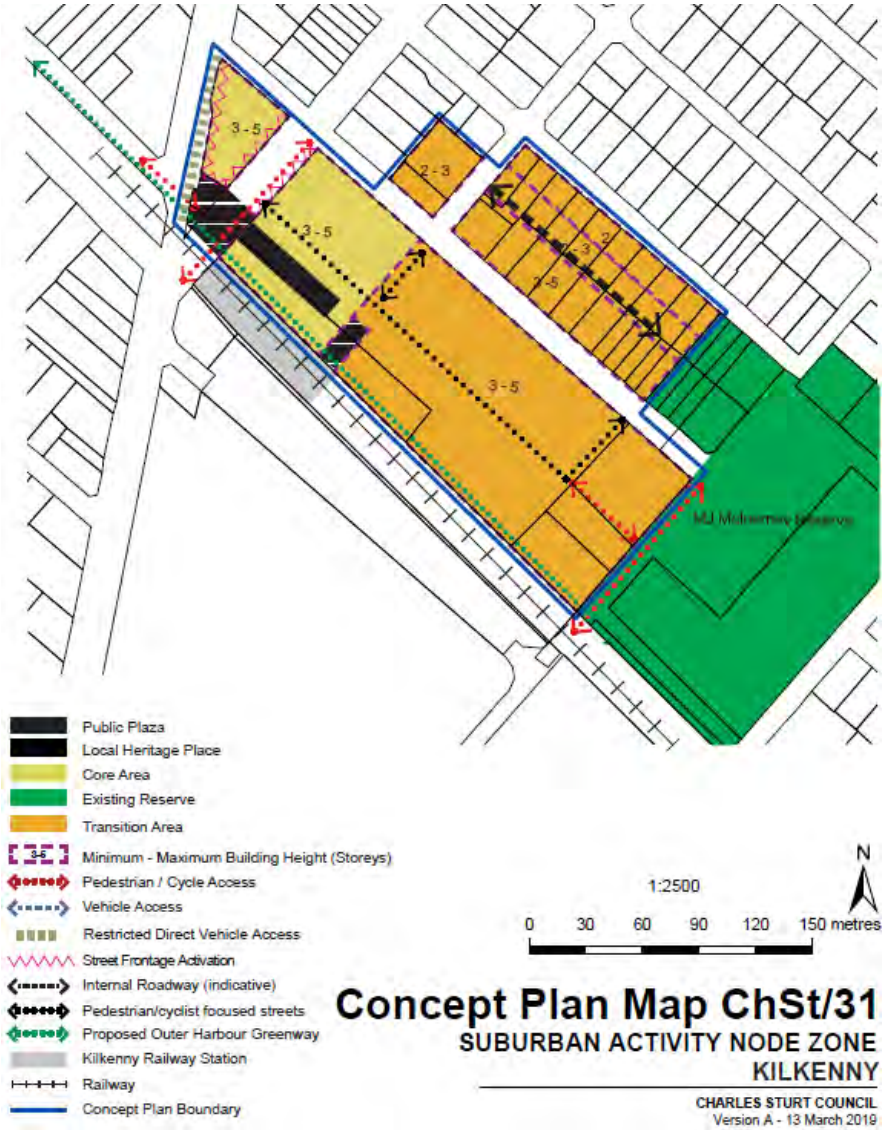
3.1. Concept Plan

The DPA proposes to rezone the subject land to allow for mixed use retail/commercial and residential dwellings. For the purpose of this Transport Impact Assessment, a potential development concept plan has been reviewed to gauge the possible traffic and transport implications on the surrounding road network.

The concept plan indicates that the land could be divided into residential allotments to allow for around 500 residential dwellings and that the land will be serviced by an internal road network which will incorporate Pinda Street and linkages to the existing surrounding road network. It has been assumed around 100 dwellings will be townhouses or similar, while the remaining 400 would be apartment dwellings in multistorey residential buildings.

The retail/commercial floor area has been assumed to have a potential yield in the order of 2,800sq.m leasable floor area (excluding ancillary and communal areas such as lift cores, loading etc) based on ground floor uses only. This is likely to be located between David Terrace and Wilpena Terrace with vehicle access for loading, delivery and on-site car parking from Wilpena Terrace. A concept map of the potential development is shown in Figure 3.1.

Figure 3.1: Development Concept Plan



3.2. Vehicle Access

As indicated above, the development proposes connection to the existing road network, and to integrate the existing Pinda Street with new streets and laneways providing rear access to individual allotments as well as the multistorey apartment blocks.

The connections to the adjacent streets would be in the form of a continuation/extension of the existing street network. It is recommended that the internal road reserves are created to match those of the continuing road and any existing footpaths are extended into the development site.

Wilpena Terrace is a No Through Road to David Terrace and provides limited access to other properties. On this basis, the majority of traffic associated with the site will utilise Pinda Street and/or Mundulla Street to access the site from David Terrace. Mundulla Street has an existing channelised right turn treatment on David Terrace, while Pinda Street does not have any existing intersection turn treatment. Access towards Torrens Road via Wilpena Terrace and Aroona Road will also be feasible.

3.3. Internal Street Network

Traffic volumes on the internal streets are anticipated to be below the typically accepted thresholds for a local residential street. Traffic volumes are discussed in further detail in Section 6. On this basis, it is considered appropriate to design all of the internal streets as local residential streets. These streets should be constructed so that vehicles and cyclists can safely 'share' the street in a low vehicle speed environment without the need for formal separation.

The local streets should be designed with the following general principles:

- Single two-way carriageway width of 7.2 metres
- Two-way laneway carriageway width of 6.5 metres, subject to any access requirements for larger vehicles
- Minor access place carriageway width of 5.5 metres with indented parking bays as required
- Local streets should accommodate access for typical Council refuse collection vehicles for the purposes of waste collection
- On-street car parking to assist in managing vehicle speeds
- Regular lateral deviation, use of different road surface treatments and landscaping adjacent to the carriageway to maintain a low vehicle speed environment
- Footpaths on both sides of the local streets to match to the existing local street network and maximise the local pedestrian connections and desire lines.

A review of the concept plan for the potential development indicates that the general principles listed above can be achieved.

4. SUSTAINABLE TRANSPORT INFRASTRUCTURE

04

4.1. Bicycle End of Trip Facilities

The Charles Sturt Council Development Plan sets out several Principles of Development Control (PDC) relating to the provision for cyclists.

The Residential Development Principle of Development Control 27 part (b) sets out that:

Site facilities for group dwellings, multiple dwellings and residential flat buildings should include bicycle parking for residents and visitors (for developments containing more than 6 dwellings).

In addition there are several Principles of Development Control set out in the Transportation and Access Section of the Development Plan relating to the provision of bicycle end of trip facilities as follows:

PDC 20: Developments should encourage and facilitate cycling as a mode of transport by incorporating end-of-journey facilities including:

(a) showers, changing facilities, and secure lockers

(b) signage indicating the location of bicycle facilities

(c) secure bicycle parking facilities provided at the rate of 3 spaces per 50 employees.

PDC 21: On-site secure bicycle parking facilities should be:

(a) located in a prominent place

(b) located at ground floor level

(c) located undercover

(d) located where surveillance is possible

(e) well-lit and well signed

(f) close to well used entrances

(g) accessible by cycling along a safe, well lit route.

Based on the above the future development will need to provide bicycle parking for customers, employees, residents and visitors on site.

It is understood many bicycle owners prefer to store their bicycle in their dwelling, and some occupiers may not own a bicycle. As townhouses are likely to be designed with garage parking it would be appropriate to assume they will have storage space for their own bicycles within their dwelling or property. Bicycle parking for the apartment buildings will need to be appropriately considered, including some publicly available bicycle parking for visitors. Staff parking could be considered within the retail/commercial component, with some publicly available customer/visitor parking combined with residential visitor parking.

Considering the proposal will be immediately adjacent a greenway, providing adequate bicycle parking options is considered important, and should be able to be incorporated in the design stage.

4.2. Walking and Cycling Network

Further to the above, the potential development will need to meet the following Principles of Development Control (also in the Transportation and Access section of the Development Plan):

PDC 18: New developments should give priority to and not compromise existing designated bicycle routes.

PDC 19: Where development coincides with, intersects or divides a proposed bicycle route or corridor, development should incorporate through-access for cyclists.

The Outer Harbor Greenway plays an important role in supporting walking and cycling for neighbourhood trips in the north-western suburbs by providing connections to schools, shops, railway stations and cafes, as well enabling longer commuting trips to and from the Adelaide CBD. The T2T South Road Project and Torrens Rail Junction Project have recently included path upgrades that have significantly improved connectivity for Greenway users. The section of Greenway between David Terrace and Day Terrace remains circuitous and should be improved as part of the proposed Development.

By providing for the greenway along the railway corridor the proposal will support these PDCs. In addition, the potential street network will provide routing options for pedestrian and cyclist access to the greenway, and these should be incorporated into the design of the site and the greenway, as well as pedestrian footpaths on the internal road network.

4.3. Public Transport

The site is accessible by public transport as discussed in Section 2.3.1.

5. CAR PARKING

05

5.1. Development Plan Car Parking Rates

Development Plan parking requirements are set out in Table ChSt/2 of the Charles Sturt Council Development Plan. The parking requirements applicable to the subject site are set out as follows:

Dwelling (detached and semi-detached)	*2 on site car parking spaces, one of which is covered (the second space can be tandem)*
Dwelling (group, row and residential flat building)	
3 or more bedrooms (or >130sq.m)	*1.25 spaces per dwelling plus an additional 0.25 visitor parking spaces*
2 bedrooms (or 75-130sq.m)	*1 space per dwelling plus an additional 0.25 visitor parking spaces*
1 bedroom (or <75sq.m)	*1 space per dwelling plus an additional 0.25 visitor parking spaces*

The above rates do not reflect potential discounts that may be applicable considering the accessibility of the subject site to Kilkenny Railway Station and other local facilities. As such the following section considers the Designated Areas car parking rates applicable to areas in appropriate zones within close proximity to frequent public transport.

5.2. Development Plan Designated Area Car Parking Rates

The Charles Sturt Development Plan considers Designated Areas as follows:

Designated Areas	Conditions
Urban Core Zone	None
District Centre Zone Local Centre Zone Neighbourhood Centre Zone Suburban Activity Node Zone	Any part of the development site is located in accordance with at least one of the following: (a) within 200 metres of any section of road reserve along which a bus service operates as a high frequency public transit service (b) within 400 metres of a bus interchange that is part of a high frequency public transit service (c) within 400 metres of an O-Bahn interchange (d) within 400 metres of a passenger rail station that is part of a high frequency public transit service (e) within 400 metres of a passenger tram station (f) within 400 metres of the Adelaide Parklands.

The parking requirements considered applicable to the retail/commercial component of the development are as follows:

All Designated Areas (unless otherwise stated)	*Desired minimum number of vehicle parking spaces:* • *3 spaces per 100 square metres of gross leasable floor area*	*Maximum number of vehicle parking spaces:* • *6 spaces per 100 square metres of gross leasable floor area*

Based on the rates presented in Table ChSt/2A there are lower rates presented for the Bowden Urban Village Urban Core Zone than for the West Lakes Urban Core Zone. The parking requirements applicable to the residential components of the subject site are set out as follows:

Dwelling (Row, semi-detached and detached)	*Urban Core Zone (Bowden Urban Village)*	*any number of bedrooms*	*0.75 spaces per dwelling*
	Urban Core Zone (West Lakes)	*1 or 2 bedrooms*	*1 space per dwelling*
		3+ bedrooms	*2 spaces per dwelling*

	Urban Core Zone (Bowden Urban Village)	*any number of bedrooms*	*0.75 spaces per dwelling*
Dwelling (residential flat building/multi-storey buildings)	*Urban Core Zone (West Lakes)*	*1 bedroom*	*1 space per dwelling plus an additional 0.25 visitor parking spaces*
		2 bedrooms	*1 space per dwelling plus an additional 0.25 visitor parking spaces*
		3 or more bedrooms	*1.25 spaces per dwelling plus an additional 0.25 visitor parking spaces*

The above indicates that for areas well serviced by public transport, lower parking rates are supported by the Development Plan, particularly for the case of row, semi-detached and detached dwellings, which under both zones identified in Table ChSt/2A have a lower parking rate than nominated in Table ChSt/2.

Table ChSt/2A also indicates that lower parking rates may be applied *"based on the nature of the development and parking conditions in the wider locality including (but not limited to) the following:*

(a) the development is a mixed use development with integrated (shared) parking where the respective peak parking demands across the range of uses occurs at different times

(b) the development is sited in a locality where the respective peak demands for parking for the range of uses (existing and proposed) occurs at different times and suitable arrangements are in place for the sharing of adjoining or nearby parking areas

(c) the development involves the retention and reuse of a place of heritage value, where the provision of on-site parking is constrained

(d) suitable arrangements are made for any parking shortfall to be met elsewhere or by other means (including a contribution to a car parking fund)

(e) generous on-street parking and/or public parking areas are available and in convenient proximity, other than where such parking may become limited or removed by future loss of access, restrictions, road modifications or widening.

(f) the site of the development is located within distances specified in the conditions applicable to Designated Areas for at least two different public transit modes."

It is envisaged that the Townhouses would provide parking on-site on a dwelling by dwelling basis, while the apartment blocks would incorporate some form of undercroft parking facility with designated parking spaces.

It is anticipated that the retail/commercial component could provide a small amount of onsite parking, however lower rates and shared parking may be applicable given the mixed use nature of the development.

6. TRAFFIC IMPACT ASSESSMENT

06

6.1. Traffic Generation

6.1.1. Design Rates

Traffic generation rates have been sourced from the Roads and Maritime Services of New South Wales (formerly RTA) in the "Guide to Traffic Generating Developments" published in 2002 (henceforth referred to as the RTA Guide). The applicable rates for the potential development are as follows;

Medium Density Residential Flat Building

Smaller units and flats (up to two bedrooms):

Daily vehicle trips — *4-5 per dwelling*

Weekday peak hour vehicle trips — *0.4-0.5 per dwelling*

Larger units and town houses (three or more bedrooms):

Daily vehicle trips — *5.0-6.5 per dwelling*

Weekday peak hour vehicle trips — *0.5-0.65 per dwelling*

Retail (Specialty Shops)

Daily vehicle trips — *55.5 trips/100sq.m*

Weekday peak hour vehicle trips — *5.6 trips/100sq.m*

Office and Commercial

Daily vehicle trips — *10 trips/100sq.m*

Weekday peak hour vehicle trips — *2 trips/100sq.m*

Based on the above rates Table 6.1 sets out the traffic generation anticipated for the subject site.

Table 6.1: Traffic Generation

Use	Number	Peak Hour		Daily	
		Traffic Generation Rate	Traffic Generation	Traffic Generation Rate	Traffic Generation
Residential	500	0.5 trips/unit	250	5.0 trips/unit	2,500
Retail	1,400sq.m	5.6 trips/100sq.m	78	55.5 trips/100sq.m	777
Commercial	1,400sq.m	2 trips/100sq.m	28	10 trips/100sq.m	140
TOTAL			356 trips		3,417 trips

Based on the above the subject site could generate in the order of 360 trips in the peak hour and 3,450 trips across the entire day.

The above traffic generation estimates include all the retail and commercial traffic generation. It is anticipated that the retail component, in particular, will provide local facilities with many trips being local walk-in trips or ancillary to other trips to or within the precinct. The potential for future increases in public transport use and bicycle use as a result of the upgrade to the greenway have also not been factored into the traffic generation. As a result, the overall traffic generation is considered to provide a very robust estimate of the potential traffic impact.

6.1.2. Distribution and Assignment

The directional distribution and assignment of traffic generated by the potential development will be influenced by a number of factors, including the:

1. Configuration of the road network in the immediate vicinity of the site, including specifically;
   - Right turns out of Aroona Road onto Torrens Road are not permitted, thus Wilpena Terrace is anticipated to carry traffic exiting to the south-east on Torrens Road;
   - For traffic coming to/from the north, it will be easiest to enter the site via a left turn into Mundulla or Pinda Streets. Instead of this traffic exiting the site via a right turn out onto David Terrace, some is anticipated to use Wilpena Terrace to head north to turn left onto Torrens Road; and
   - Proposal to prevent right turns in and out of Pinda Street due to the proximity to the rail level crossing and limited opportunities to create a suitable right turn lane.
2. Existing operation of intersections providing access between the local and arterial road network
3. Distribution of households in the vicinity of the site
4. Surrounding employment centres, retail centres and schools in relation to the site
5. Configuration of access points to the site.

Having consideration to the above, for the purposes of estimating vehicle movements, the following directional distributions have been assumed:

- David Terrace - North 20%
- David Terrace - South 65%
- Torrens Road - East 15%.

In addition, the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) has been assumed as 20:80 in the AM peak period, and 80:20 in the PM peak period.

Based on the above, Figure 6.1 and Figure 6.2 have been prepared to show the estimated marginal increase in traffic volumes in the vicinity of the subject property following full site development.

Figure 6.1: AM Peak Hour Site Generated Traffic Volumes

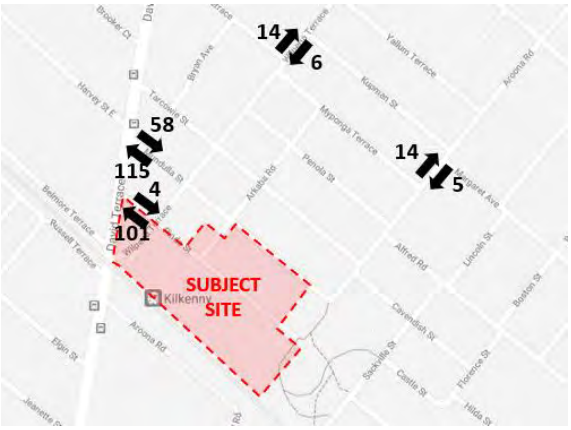
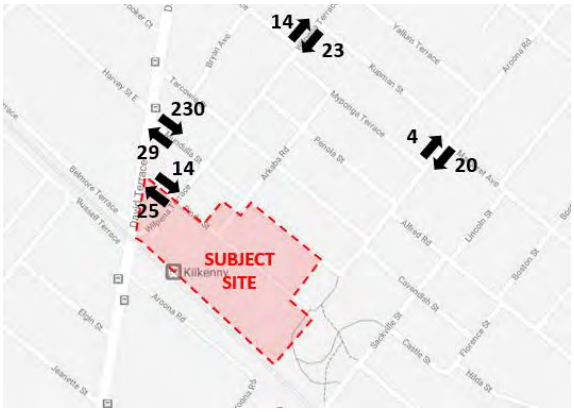


Figure 6.2: PM Peak Hour Site Generated Traffic Volumes



Based on the above, estimated turning movements associated with the development at the Pinda Street and Mundulla Street intersections with David Terrace are shown in Figure 6.3 and Figure 6.4.

Figure 6.3: AM Peak Hour Site Generated Turning Movements

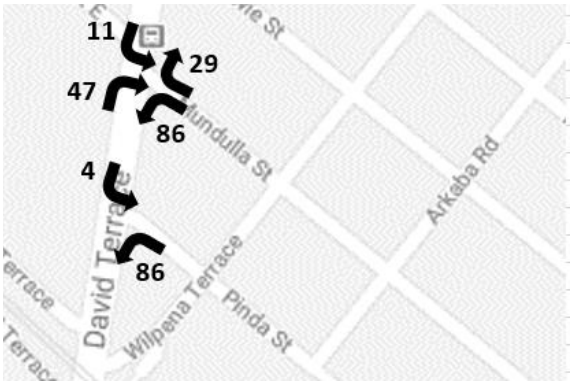


Figure 6.4: PM Peak Hour Site Generated Turning Movements

6.2. Traffic Impact

The predicted traffic volumes on the surrounding road network will be a significant increase given the existing site is not currently operational and thus is not currently generating traffic volumes. Nonetheless as shown in Figure 6.5 below the traffic volumes will be under 2,000 vehicles per day, with only Mundulla Street likely to exceed 2,000vpd.

Figure 6.5: Estimated Daily Traffic Volumes Post Development

There will be a need to confirm the road hierarchy and classification at the time of the development application(s) and the exact nature of the development has been identified and likely traffic generation and distribution patterns are known. Use of Pinda Street and Mundulla Street is likely to be primarily by vehicles accessing the existing and proposed residential uses which abut them. This would generally remain appropriate and consistent with their current functional role in the road network.

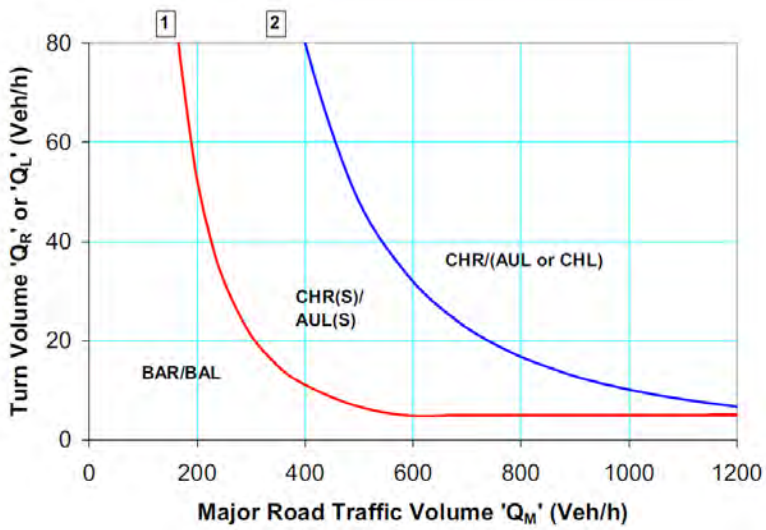
However, should development of the site achieve its full potential allowed within the DPA, traffic volumes are likely to exceed the nominal volume defined for a local road. Mundulla Street is expected to operate as a local collector road in volume and function at least between David Terrace and Arkaba Road. With the proposed access restrictions at David Terrace, Pinda Street is however likely to continue to function as a local street providing only local access to the development. GTA notes that, given the subject site has been unoccupied for many years, any redevelopment of the subject site would result in an increase in traffic volumes in the area, although the post development volumes could be a significant increase in comparison to conventional residential development in this location.

David Terrace currently carries around 19,900 vehicles per day, while the potential development could generate in the order of 2,760 vehicle trips per day that are anticipated to use David Terrace. This is around 770 vehicles per day higher than the typically anticipated 10% fluctuation in day to day volumes. As such it is anticipated that the traffic generation associated with the development of the subject site will be able to be catered for within the road network.

6.2.1. Pinda Street Intersection

GTA has considered the warranted turning treatments at the Pinda Street intersection based on the above estimated traffic volumes. Figure 4.9(b) in the *Austroads Guide to Road Design Part 4A – Unsignalised Intersections* has been consulted (shown in Figure 6.6).

Figure 6.6: CHR Warrant Assessment



Based on the above a channelised right turn lane into Pinda Street from David Terrace would be warranted given the potential for a high number of right turners and high through volumes in the peak hour.

The provision of a channelised right turn lane will be restricted by the proximity of the railway line on David Terrace, with approximately 85 metres from the Pinda Street centre line to the railway crossing. A channelised right turn lane may impact upon on street parking currently provided on David Terrace (west side) and the bicycle lane depending on lane widths designed.

As David Terrace is subject to a posted 60km/h design speed, any channelised right turn lane should allow for a stop condition from a design speed of 70km/h, which would be 75 metres (at 2.5m/s^2 deceleration) or 55 metres (at 3.5m/s^2 deceleration) deceleration lane length (not including queue storage) (referencing Table 5.2 in *Austroads Guide to Road Design Part 4A – Unsignalised Intersections*).

The safety considerations relating to the level crossing and the design requirements for a channelised right turn lane suggest that a conversion of Pinda Street to a left-in and left-out format would be the most appropriate and safest

intersection treatment. This would enable the exisitng on-street parking and bicycle lanes to be retained which would benefit the adjoining shops.

As a result of preventing right turns into Pinda Street, there will be increased vehicle movements at Mundulla Street, and impacts associated with this have been considered below in relation to the operation of the Mundulla Street intersection.

6.2.2. Mundulla Street Intersection

The existing intersection of Mundulla Street/David Terrace has a channelised right turn lane of approximately 43 metres (including taper length) on David Terrace.

Referencing Table 5.2 in *Austroads Guide to Road Design Part 4A – Unsignalised Intersections*, for a design speed of 70km/h, a channelised right turn lane of 75 metres (at 2.5m/s^2 deceleration) or 55 metres (at 3.5m/s^2 deceleration) deceleration lane length (not including queue storage) is required. As such the existing intersection does not comply with this guideline. Due to the proximity of Pinda Street (being located approximately 75 metres south of Mundulla Street) full deceleration length plus queue storage is unlikely to be achieved within the current carriageway footprint without extending past Pinda Street (making it left in/out only) and potentially impacting on on-street parking.

GTA has assessed the performance of this intersection in SIDRA Intersection based on Pinda Street being restricted to left-in, left-out only, with a summary of the PM peak hour results shown in Figure 6.7.

Figure 6.7: David Terrace/Mundulla Street Intersection Post Development – PM Peak Hour SIDRA results

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop Queued	Effective Stop Rate per veh	Average Speed km/h
South: David Terrace											
2	T1	857	5.0	0.444	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
3	R2	243	0.0	0.402	13.0	LOS B	1.9	13.1	0.77	0.98	44.9
Approach		1100	3.9	0.444	2.9	NA	1.9	13.1	0.17	0.22	55.8
East: Mundulla Street											
4	L2	100	0.0	0.384	12.6	LOS B	1.5	10.4	0.82	1.00	41.2
6	R2	13	0.0	0.384	78.0	LOS F	1.5	10.4	0.82	1.00	41.0
Approach		113	0.0	0.384	19.9	LOS C	1.5	10.4	0.82	1.00	41.2
North: David Terrace											
7	L2	65	0.0	0.458	5.6	LOS A	0.0	0.0	0.00	0.04	57.8
8	T1	813	5.0	0.458	0.1	LOS A	0.0	0.0	0.00	0.04	59.4
Approach		878	4.6	0.458	0.5	NA	0.0	0.0	0.00	0.04	59.3
All Vehicles		2091	4.0	0.458	2.8	NA	1.9	13.1	0.13	0.19	56.1

The above analysis shows there is capacity available within the Mundulla Street intersection to cater for all right turn in/out traffic from Pinda Street, should the proposed turning restrictions at Pinda Street be implemented.

By way of comparison under existing volumes the subject intersection has a Degree of Saturation of 0.44, and an average delay of 0.5 seconds and a 95th percentile queue of 3.5 metres.

The additional traffic volumes at the Mundulla Street/David Terrace intersection could increase queues in the channelised right turn lane on David Terrace (for vehicles waiting to turn right), although the modelling indicates this queue will remain well within the capacity of the right turn lane.

6.2.3. Mundulla Street and Wilpena Terrace intersection

The recent 5-year crash history (discussed in Section 2.2.4) indicates 3 crashes involving a south-eastbound vehicle on Mundulla Street disobeying the give way sign at the intersection with Wilpena Terrace. Council has indicated resident correspondence relating to safety concerns at this intersection, with additional anecdotal crash history identified but not reported. Some line marking changes have been made in 2016 to improve sightlines at the intersection, by repositioning

the give way line, which allows for improved views from Mundulla Street to Wilpena Terrace (i.e. drivers looking to the northeast or southwest).

The increase in traffic volumes at this intersection will primarily be added to the Mundulla Street through movement. As such, treatment options to improve the safety and capacity of this location should be considered, given the existing crash history and the additional traffic volumes anticipated through this intersection. It is recommended that Council seeks to upgrade the intersection to improve road safety and sight distances at this location. Modifications to better align and delineate the kerbs on the Mundulla Street approach from the north west may be sufficient to improve the sight distances and intersection clarity for drivers and pedestrians.

Other intersection formats can be considered at the development application stage when the final composition, access locations and traffic generation of the development are known. Local pedestrian and bicycle access routes to the Greenway will also have been defined at that stage and if required the intersection treatment should accommodate such routes safely.

7. CONCLUSION

07

CONCLUSION

Based on the analysis and discussions presented within this report, the following conclusions are made:

1. The proposed Development Plan Amendment identifies a residential lead development on former industrial land located to the north of the railway line in Kilkenny.
2. The potential development will be required to provide off-street parking for residents and include some parking provision for visitors. The Development Plan should be consulted, although further discounts in parking rates due to the proximity of the subject site to the Kilkenny Railway Station may be appropriate.
3. The provision for bicycle facilities will need to be incorporated in the design stage. Provision for the completion of this section of the Outer Harbor Greenway alignment along the railway corridor is incorporated in the concept plans provided.
4. The site is expected to generate in the order of 360 trips in the peak hour and 3,450 trips across the entire day.
5. There is adequate capacity in the surrounding road network to cater for the traffic generated by the proposed development, although it is likely that sections of Mundulla Street will be designated as a local collector road to reflect a revised function and traffic volume within the local road network.
6. The site is highly accessible by public transport (rail and bus) services and local bikeway connections, providing opportunities for travel without reliance on the private car.
7. The additional traffic volumes at the Mundulla Street/David Terrace intersection could increase queues in the channelised right turn lane on David Terrace (for vehicles waiting to turn right), although modelling indicates this queue will remain within the capacity of the right turn lane.
8. A channelised right turn lane on David Terrace into Pinda Street is warranted, though proximity to the railway line and the channelised right turn design requirements indicate that conversion of Pinda Street to a left-in and left-out arrangement be proposed on road safety grounds.
9. Treatment options at the intersection of Mundulla Street and Wilpena Terrace should be considered in relation to the existing crash history, anticipated additional traffic volumes and local pedestrian and bicycle access routes prior to determining any appropriate intersection upgrade format.

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Appendix C – Environmental Noise Assessment, Sonus

Kilkenny DPA

Environmental Noise Assessment

S5913C4

July 2019

sonus.

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Document Title	Kilkenny DPA Environmental Noise Assessment
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Author	Jason Turner, MAAS
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EXECUTIVE SUMMARY

An environmental noise assessment has been made of the Development Plan Amendment (DPA) under consideration for land adjacent to David Terrace, Kilkenny.

The assessment considers all noise sources in the vicinity, including the O-I Glass facility operating at its full operational capacity, the future warehouse development as envisaged at the southern interface of the DPA land, the rail corridor, the influence of Kilkenny Road and potential commercial activity within the DPA land itself. The assessment considers the cumulative impact of all of these activities combined.

The cumulative assessment results in specific, targeted and significant acoustic treatments which will be required to be designed into any future residential land use on the DPA land.

The treatments will provide a reasonable level of acoustic amenity within the dwellings and will protect the unfettered operation of both existing and envisaged industrial, commercial and public infrastructure activity.

Provisions have been developed for inclusion in the DPA in order to ensure these treatments are incorporated into the future residential development.

The provisions for industrial and commercial activity are based on the requirements of the *Environment Protection (Noise) Policy 2007*, which provides the most relevant noise criteria to ensure appropriate residential amenity, and is already referenced within the Development Plan. The Policy provides specific noise levels to be achieved *inside the future residences* from activity at the surrounding land uses. The goal internal noise levels can be achieved through specific acoustic design of the building facades. The extent of treatment will depend on the level of noise reduction (from outside to inside) which is required.

The provisions for road, rail, and mixed use activity already exist within the Development Plan through the Noise and Air Emissions Overlay. It is recommended the subject site, rail corridor, and Kilkenny Road / David Terrace are designated in the overlay, which would introduce mandatory construction requirements for the facades future dwellings under *Minister's Specification "SA 78B – Construction requirements for the control of external sound"* (SA78B).

The mechanism of SA78B (which relies on achieving a minimum noise transfer from outside to inside a dwelling) provides an opportunity to combine the cumulative impacts of all noise sources in the vicinity of the site.

Its adaptation for all noise sources provides the DPA with a contemporary, simple and single design approach for the dwellings, making it easier for all stakeholders to confirm that the dwellings incorporate the adequate amount of acoustic treatments.

The adaptation of SA78B is achieved by considering the cumulative external noise levels and determining the facade noise reduction which would be required to achieve the internal noise levels provided by the Policy. External noise levels due to existing and future industrial activity have been predicted based on previous noise modelling, measurements, and understanding of OI Glass operations dating back over 10 years. The predictions account for the combined *potential capacity* at the O-I glass site (which may exceed the current operating scenario), and the envisaged future activity at the approved store warehouse located west of the current OI Glass site. The cumulative noise from both existing and future activity has been considered in the predictions.

The recommended provisions which combine both the Policy and SA78B into one mechanism enable *all* nearby noise sources to be considered using a unified approach and control mechanisms which already exist within the Development Plan.

Finally, further provisions are recommended for the design of balconies and outdoors areas (which are not addressed through treatments to the façade), to extend the treatments beyond those which can be achieved by façade treatment alone to the fundamental layout of the residential buildings.

INTRODUCTION

A Development Plan Amendment (DPA) is being considered for land adjacent to David Terrace, Kilkenny, for the extent depicted in Figure 1 below. The proposed amendment will designate the subject land as a mixed use zone which will principally promote commercial and high density residential development.

Figure 1: *Subject land and locality.*

The subject land is currently located within an *Urban Employment Zone* of the Charles Sturt Council Development Plan[1]. The subject land interfaces with existing residential areas and therefore the DPA will remove the interface of potential industrial uses with these existing residential areas. There are existing and future industrial activities (associated with O-I Glass) within the *Urban Employment Zone* to the south and southwest of the subject land respectively which will create a new interface. The acoustic environment also incorporates a passenger rail corridor between the industrial land uses and the DPA subject land, and road traffic on Kilkenny Road and David Terrace to the west.

[1] Consolidated 13 September 2018.

This assessment considers the two key potential noise impacts associated with future dwellings in the DPA subject land:

1. the amenity of the future dwellings when exposed to the existing and envisaged industrial interface and other noise sources in the vicinity; and
2. whether the future dwellings will unreasonably constrain the existing and envisaged industrial activities.

Specifically, the assessment considers the following noise sources:

1. rail noise from the nearby passenger rail corridor;
2. traffic noise from Kilkenny Road and David Terrace;
3. mixed use activity within the subject land;
4. the noise from the existing OI Glass site operating at full capacity;
5. the noise from the proposed future O-I Glass warehouse on separate land to the current site.

Appendix A shows the location of the relevant noise sources.

The assessment has been based on:

- "Concept Plan 1" site layout drawing, from "2009 Master Plan", received via email on 17 April 2019 (see Appendix C); and,
- Previous noise measurements and predictions of noise from activity in the vicinity of the subject site, as detailed further in this report.

This report summarises the assessment and provides provisions for inclusion in the DPA to ensure appropriate residential amenity within the subject land, and to minimise unreasonable constraints on existing and potential future land uses desired in the locality.

CRITERIA

Development Plan

The Charles Sturt Council Development Plan has been reviewed, and the following provisions have been considered relevant to the assessment:

GENERAL SECTION

Interface between Land Uses

OBJECTIVES

1. *Development located and designed to minimise adverse impact and conflict between land uses.*
2. *Protect community health and amenity from adverse impacts of development.*
3. *Protect desired land uses from the encroachment of incompatible development.*

PRINCIPLES OF DEVELOPMENT CONTROL

1. *Development should not detrimentally affect the amenity of the locality or cause unreasonable interference through any of the following:*
   (b) Noise
2. *Development should be sited and designed to minimise negative impacts on existing and potential future land uses desired in the locality.*
4. *Residential development adjacent to non-residential zones and land uses should be located, designed and/or sited to protect residents from potential adverse impacts from non-residential activities.*
5. *Sensitive uses likely to conflict with the continuation of lawfully existing developments and land uses desired for the zone should be designed to minimise negative impacts.*
6. *Non-residential development on land abutting a residential zone should be designed to minimise noise impacts to achieve adequate levels of compatibility between existing and proposed uses.*

Noise Generating Activities

8. *Development that emits noise (other than music noise) should include noise attenuation measures that achieve the relevant "Environment Protection (Noise) Policy" criteria when assessed at the nearest noise sensitive premises.*

9. *Development with the potential to emit significant noise (e.g. industry) should incorporate noise attenuation measures that prevent noise from causing unreasonable interference with the amenity of noise sensitive premises.*

Residential Development

PRINCIPLES OF DEVELOPMENT CONTROL

Private Open Space

13. *Private open space (available for exclusive use by residents of each dwelling) should be provided for each dwelling and should be sited and designed:*
    - *(i) to minimise noise or air quality impacts that may arise from traffic, industry or other business activities within the locality*

Noise

23. *Other than within an area designated for the purposes of the Noise and Air Emissions Overlay, residential development close to high noise sources (eg major roads, railway lines, tram lines and industry) should be designed to locate bedrooms, living rooms and private open spaces away from those noise sources, or protect these areas with appropriate noise attenuation measures.*
25. *External noise and artificial light intrusion into bedrooms should be minimised by separating or shielding these rooms from:*
    - *(a) active communal recreation areas, other common access areas, parking areas and vehicle access ways*
    - *(b) service equipment areas and fixed noise sources on the same or adjacent sites.*

The Development Plan seeks residential development to provide suitable amenity for occupants with respect to the noise from rail, road, mixed use, and industrial activity and to also be designed so as not to constrain the approved operation of existing or future desired land uses. A number of provisions relate to these broad objectives including orientation and/or treatment of buildings to face away from significant noise sources.

Provisions which address noise intrusion from road, rail, and mixed use activity already exist within the Development Plan through the Noise and Air Emissions Overlay. The subject site and nearby road and rail corridors are not currently designated; however, the following existing provisions within the Development Plan can be adopted in the DPA through designation:

OVERLAY SECTION

Noise and Air Emissions Overlay

OBJECTIVES

1. *Protect community health and amenity from adverse impacts of noise and air emissions*

PRINCIPLES OF DEVELOPMENT CONTROL

1. *Noise and air quality sensitive development located adjacent to high noise and/or air pollution sources should:*
   - *(a) shield sensitive uses and areas through one or more of the following measures:*
     - *(i) placing buildings containing less sensitive uses between the emission source and sensitive land uses and areas*
     - *(ii) within individual buildings, place rooms more sensitive to air quality and noise impacts (e.g. bedrooms) further away from the emission source*
     - *(iii) erecting noise attenuation barriers provided the requirements for safety, urban design and access can be met*
   - *(b) use building design elements such as varying building heights, widths, articulation, setbacks and shapes to increase wind turbulence and the dispersion of air pollutants provided wind impacts on pedestrian amenity are acceptable*
   - *(c) locate ground level private open space, communal open space and outdoor play areas within educational establishments (including childcare centres) away from the emission source.*

In addition to the current provisions, this assessment establishes *objective criteria* to assist in satisfying the Development Plan.

The relevant noise criteria to address the Development Plan requirements vary according to the noise source under consideration. Based on the Development Plan provisions, the following noise policies and standards have been considered;

- *Environment Protection (Noise) Policy 2007 (*and by extension, the *Australian/New Zealand Standard AS/NZS2107*) to provide suitable internal noise criteria to achieve appropriate residential amenity; and,
- Minister's Specification *"SA 78B – Construction requirements for the control of external sound" (SA78B)*, to provide suitable (indicative) building constructions to address external noise intrusion from road, rail and mixed use activity (noting that SA78B becomes mandated when for a designated area in the Development Plan).

Environment Protection (Noise) Policy 2007

The *Environment Protection (Noise) Policy 2007* (the Policy) provides the most relevant noise criteria to ensure appropriate residential amenity *when exposed to industrial noise sources*, and is already referenced within the Development Plan.

The Policy is underpinned by the World Health Organisation Guidelines[2] for community noise and is directly linked to *Australian/New Zealand Standard AS/NZS2107*[3] (the AS2107 Standard). The Policy provides both an objective measure of acceptable noise levels for residential amenity and also for the protection of the ongoing operation of existing industrial land uses. That is, achieving the relevant requirements of the Policy at future dwellings on the subject site would provide suitable residential amenity and would protect existing activities from any action under the *Environment Protection Act 1993* in the event of a noise complaint.

[2] Berglund, Lindvall and Schwela, 1999, "Guidelines for Community Noise"
[3] Australian/New Zealand Standard AS/NZS2107 "Acoustics – Recommended design sound levels and reverberation times for building interiors"

Specifically, the Policy provides noise criteria:

- outside of a residence, such as in a backyard or other private open space; *or*
- inside habitable rooms of a residence, such as bedrooms and living areas, in situations where acoustic treatment is applied to a facade.

The Policy provides goal noise levels based on the Development Plan zones of the area. For the combination of the DPA zoning and existing *Urban Employment Zone*, the Policy provides the following goal noise levels to be achieved *inside the future residences* from activity at the surrounding land uses:

- Daytime (7am to 10pm) noise level of 41 dB(A); and,
- Night time (10pm to 7am) noise level of 33 dB(A).

Under the Policy, penalties are applied to the measured or predicted noise levels for each characteristic of tone, impulse, low frequency and modulation that the noise source exhibits. Based on the observations and noise measurements conducted at the subject site, a penalty would not be warranted due to the combined influence of steady industrial noise and existing intermittent road and rail movements in the existing acoustic environment; however, for a DPA, a conservative approach is adopted and as such, a 5 dB(A) penalty is applied to this assessment.

Minister's Specification SA 78B

The Minister's Specification "*SA 78B – Construction requirements for the control of external sound*" (SA78B) provides the most relevant noise criteria to ensure appropriate residential amenity *when exposed to road, rail and mixed use activity*, and its mandatory application as part of Building Rules Consent is triggered by designation within the Noise and Air Emissions Overlay of the Development Plan.

SA78B is the contemporary State Government approach relating to development in the vicinity of transport corridors and mixed use activity as part of the Building Rules Consent process.

The requirements of SA 78B can be met through either a "verification" or a "deemed to satisfy" method.

Given that the actual dwelling designs on each proposed allotment are not known at this stage, it is proposed that the "deemed to satisfy" method be used to provide an indicative assessment of the practicality of addressing noise impacts from rail, road, and mixed use activity.

The "deemed to satisfy" method of SA78B requires acoustic treatment to be incorporated to dwellings based on the *sound exposure category* that the various facades of the dwelling fall under. The categories range from 1 to 5, with Category 1 requiring limited acoustic treatment and Category 5 requiring extensive treatment. The category is assigned depending on the distance from the road or rail corridor, and the orientation of the facade relative to that road or rail corridor.

The different exposure categories are based on a standard dwelling construction achieving a 20 dB(A) noise reduction across its facade (this noise reduction is commonly accepted to be the minimum reduction a standard habitable dwelling will provide and has been tested on numerous occasions to be a satisfactory estimate). Each exposure category effectively represents a 4 dB(A) improvement in noise reduction on the previous, meaning that the extent of acoustic treatment increases accordingly. The categories and corresponding facade noise reduction are as follows:

Table 1: *SA78B facade noise reduction for each sound exposure category.*

Sound Exposure Category	Facade Noise Reduction
None (typical façade)	20 dB(A)
1	24 dB(A)
2	28 dB(A)
3	32 dB(A)
4	36 dB(A)
5	40 dB(A)

It is readily accepted that category 3 can be achieved using extensive but reasonable and practicable measures, whereas the higher categories (4 and 5) introduce esoteric treatments well beyond normal construction methods.

SA78B can also be adapted to consider industrial activity.

This is done by considering the external noise levels due to existing and future industrial activity and determining the facade noise reduction which would be required to achieve the internal noise levels provided by the Policy (being a day time noise level of 41 dB(A) and night time noise level of 33 dB(A)). For example, if it is predicted that a future multi-storey apartment will be exposed to an external noise level of 58 dB(A) during the night (with a 5 dB(A) penalty included), then the facade should be designed to achieve a noise reduction of 58 – 33 = 25 dB(A). A noise reduction of at least 25 dB(A) is provided by an SEC 2 facade construction (referring to Table 1 above).

Adaptation of SA78B allows *all noise sources* in the vicinity of the subject site to be considered and compared using a consistent mechanism which already exists within the Development Plan.

ASSESSMENT

Rail and Road

The "deemed to satisfy" requirements of SA78B have been reproduced in Table 2 below, based on the separation distance between the facade of a future dwelling and the rail or road corridor as relevant. The resulting categories for the subject site are provided below in Figures 2 and 3 for rail and road respectively.

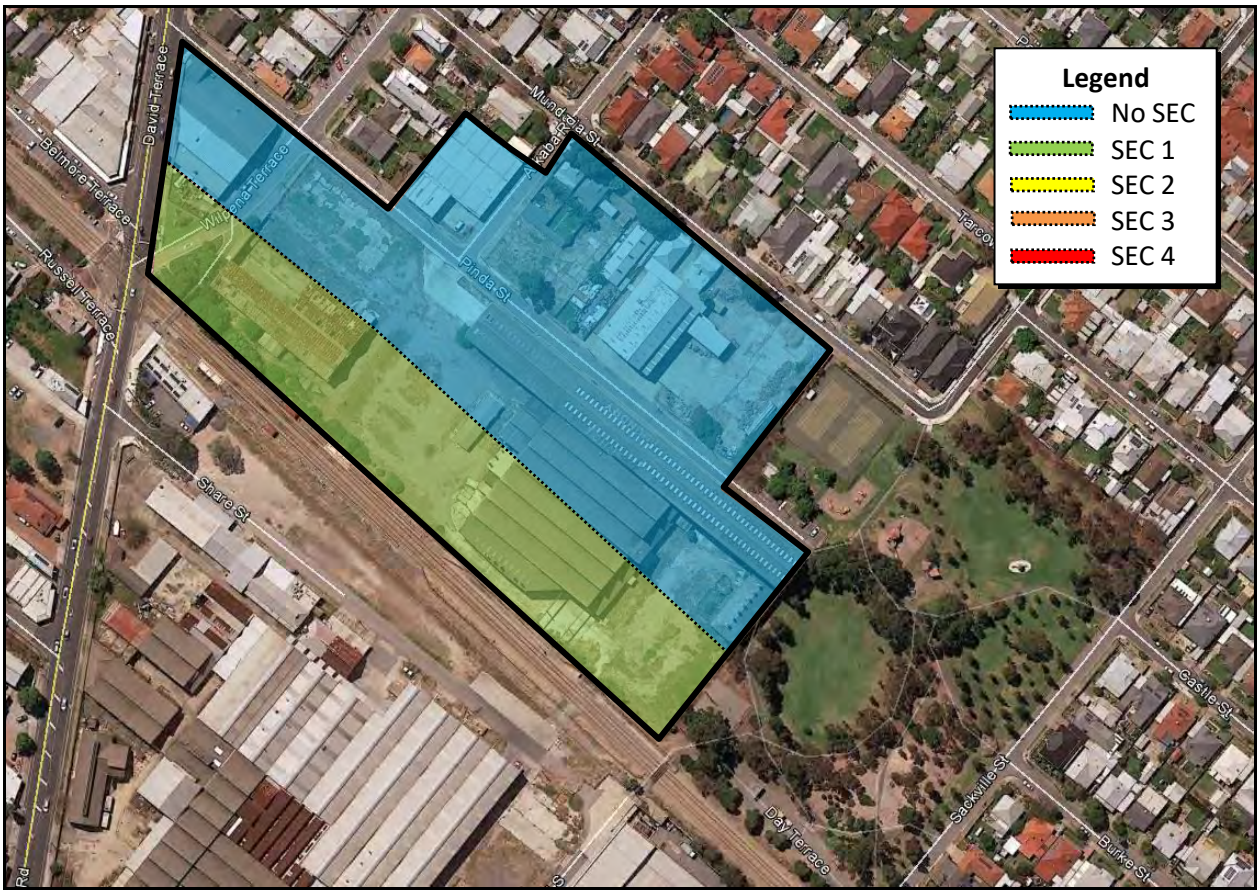
Table 2: *SA78 rail and road sound exposure categories.*

Sound exposure category	Separation from Train Line	Separation from Type A Road (Speed limit 60km/h)
1	25 < 50m	60 < 100m
2	10 < 25m	35 < 60m
3	Less than 10m	15 < 35m
4	N/A	Less than 15m
5	N/A	N/A

Based on the assessment, residences within the area shown as green will require specific treatments to adequately address noise from the rail corridor. Therefore, it is recommended that the rail corridor is designated under the Noise and Air Emissions Overlay for the portion immediately adjacent to the site. This will introduce mandatory construction requirements for future dwellings within the subject site.

Indicative treatments are provided in Appendix B for the relevant SEC.

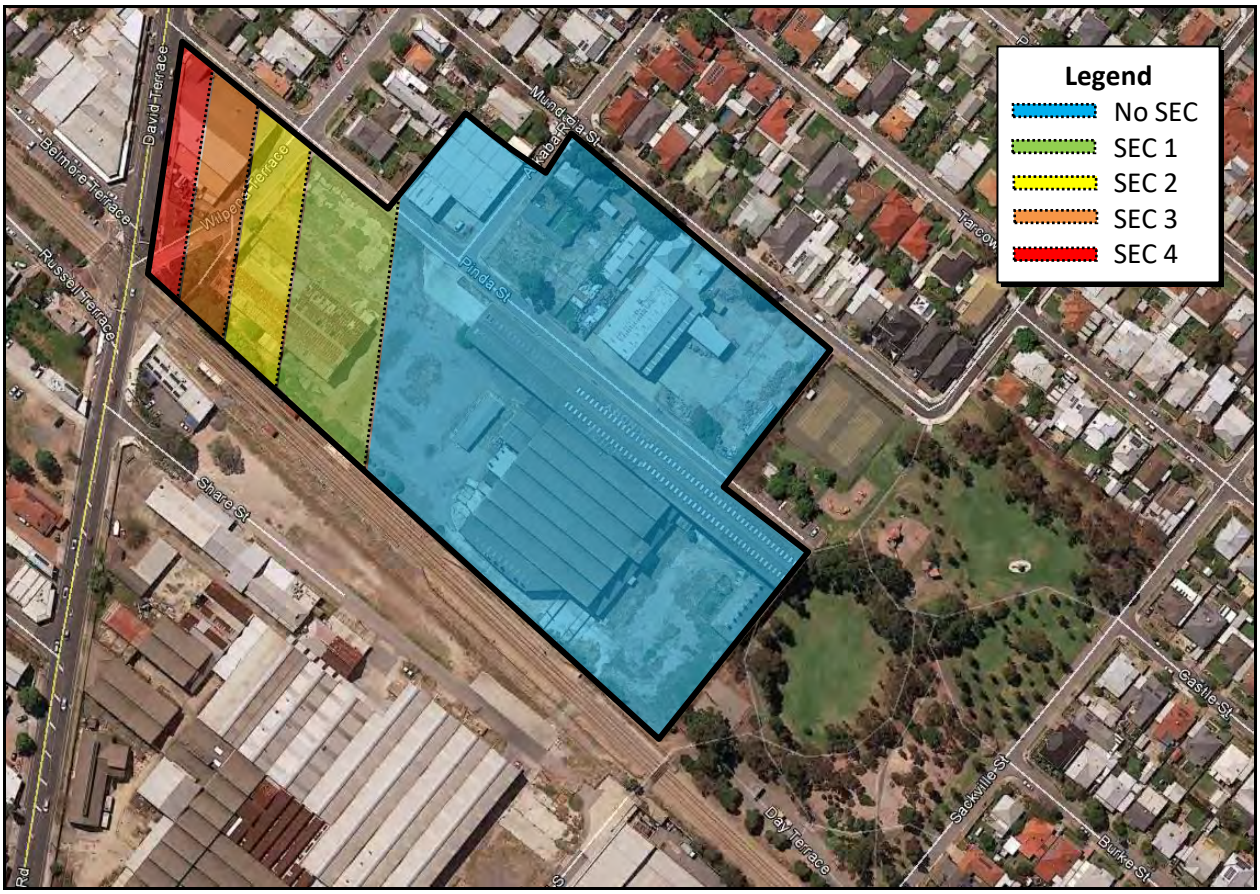
Figure 2: *Sound exposure category from rail.*



For the road impacts, the portion of Kilkenny Road and David Terrace closest to the site is a Type A road in the *South Australian Planning Policy Noise and Air Emissions-Overlay 3*.

The allotments of the subdivision which would require acoustic treatment have been determined based on the "deemed to satisfy" requirements of SA78B (reproduced in Table 2) for a Type A road with a 60 km/hr speed limit and are as shown in Figure 3 below.

Figure 3: *Sound exposure category from roads.*



Based on the above, future dwellings may require SEC 4 treatments depending on the proximity to Kilkenny Road and David Terrace. This represents a significant amount of treatment which could limit aspects of a building's design such as window area, bedroom orientation and the practicality of openings onto balconies. However, it is understood that the land uses fronting David Terrace will be primarily commercial and retail, with the dwellings being located further east in the area (where SEC 2 would apply). A sound exposure category of 2 can be achieved with reasonable and practicable levels of acoustic treatments as summarised in Appendix B.

To ensure that future residences are designed to adequately address noise impacts from the road, regardless of location within the subject site, it is recommended that Kilkenny Road and David Terrace be designated within the Noise and Air Emissions Overlay of the Development Plan. This will introduce mandatory construction requirements for future dwellings within the subject site. Indicative treatments are provided in Appendix B for the relevant SEC.

It is noted that Figures 2 and 3 above do not account for the effects of shielding from adjacent structures as the site is developed over time. The shielding effect could allow the category to be reduced in accordance with SA78B. That is, the above figures provide for a worst case scenario in terms of the need for acoustic treatment.

Mixed use activity

As the DPA is likely to incorporate a mix of commercial and high density residential land used in close proximity, it is appropriate to designate the DPA subject land under the Noise and Air emissions overlay in the Development Plan. This would ensure minimum design features to address mixed use activity are incorporated. SA78B specifies that any façade within a mixed use area must have a minimum sound exposure category SEC of 1. Indicative treatments for a SEC 1 façade are provided in Appendix B.

Industrial activity

The industrial activity most relevant to the subject site comprises the existing and future uses associated with O-I Glass. To determine indicative treatments for dwellings, the noise levels from existing and future activity at O-I glass has been predicted to all locations within the subject site.

Noise from existing activity at the O-I glass site has previously been predicted by Sonus in 2012 (report ref. "S2003C72"). The assessment considered the site operating at full capacity (at the time of assessment), which included:

- *All* furnaces and associated forming, cold end, and palletising areas operating;
- Continuous batching from the batch house to the furnaces;
- Continuous operation of sand receival equipment;
- Continuous operation of all cooling towers and compressors;
- All doors and ventilation openings of the buildings (except the high level doors of the AD2, AD5, and AD6 furnace buildings) in their normally open position;
- General activity within the dispatch area; and,
- Truck activity within the rear yard of the plant.

New activities and alterations to existing activities have been introduced at the O-I Glass site since 2012. The activities relevant to the noise assessment were considered in subsequent Sonus reports and included:

- alternative raw material delivery methods;
- operation of raw material blowers; and,
- the glass tipping process.

All above noise sources have been combined into a single 3 dimensional noise model which reflects the current *potential capacity* at the O-I glass site (that is, the operating capacity regardless of the current operating scenario[4]).

To account for future envisaged activity, a 3 dimensional model of the approved Commercial and General warehouse facility associated with O-I glass has been added to the existing noise model to include:

- On-site trucks movements;
- Forklift movements and loading activity; and,
- General warehouse activity.

The resulting noise model therefore accounts for the cumulative effect of the existing O-I site operating at its full potential capacity and for future activity at the warehouse facility to the west of the O-I Glass site, incorporating all barriers and other acoustic treatment measures associated with the onsite activity. The predictions are based on the SoundPlan noise modelling software which takes into account topography, ground absorption, air absorption and meteorological conditions. This assessment has been made under worst-case (highest noise level) meteorological conditions for sound propagation.

Noise levels have been predicted at all locations within the subject site, including at a height to account for the possibility of multi-storey residential development (up to 6 storeys envisaged). Where this occurs, the upper floors may overlook the 6m high wall along the boundary of the O-I glass site and the fence to the warehouse site and therefore will not enjoy the significant noise reduction such measures provide.

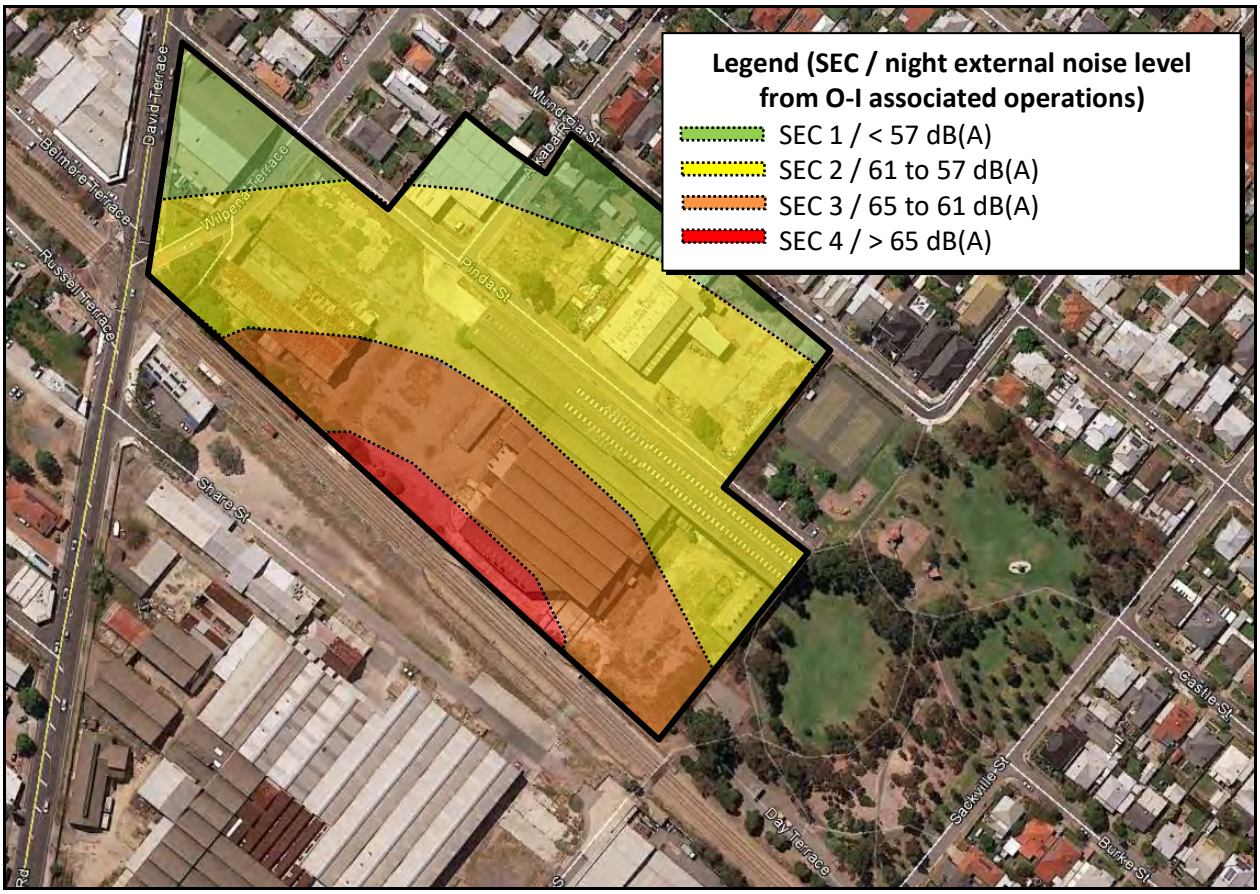
In the circumstance where the future residences at the subject site are designed to achieve the internal noise level criteria of the Policy when exposed to the predicted external noise level, the O-I glass activities will not be constrained and a reasonable level of amenity will be provided inside the residences.

[4] Understood to currently be less than half of the site capacity.

The SECs which are required to achieve the internal noise levels of the Policy when exposed to the predicted external noise levels are provided in Figure 4.

The indicative treatments can be derived from Appendix B for the corresponding SEC in Figure 4. The location of dwellings in very close proximity to the *Urban Employment Zone* boundary can result in extensive treatments although this extent of treatment becomes practical (SEC 3 or lower) if residences can be located away from the warehouse site boundary for a distance as shown in red in Figure 4 below (approximately 20m from the boundary).

Figure 4: *Minimum required noise reduction from industry.*



An issue which is not addressed by the above approach (comprising the design of external facades to address internal noise amenity) is the potential for complaint from occupants on balconies or in private open spaces.

Whilst such complaints cannot be pursued further through the *Environment Protection Act 1993* if suitable internal noise levels are achieved, design features such as orientation of private external space facing away from the main noise sources would minimise the potential for future interface issues.

The approach of incorporating design features like orientation and shielding is consistent with the Charles Sturt Council Development Plan provisions which recommend, amongst other things, that private open space should be sited and designed to minimise noise impacts.

The following provisions have been developed for inclusion in the DPA to reinforce the above objective assessment methodology and to ensure design features such as orientation of balconies away from O-I. The objective of the provisions is to ensure appropriate residential amenity within the subject land, and to minimise unreasonable constraints on existing and potential future land uses desired in the locality.

RECOMMENDED DPA NOISE PROVISIONS

Based on the assessment, residential development can be in accordance with the objectives of the Development Plan in the DPA investigation area subject to the provision of suitable acoustic treatments. The following overarching objectives have been developed to provide a framework for these treatments and to supplement the existing Development Plan provisions:

OBJECTIVES

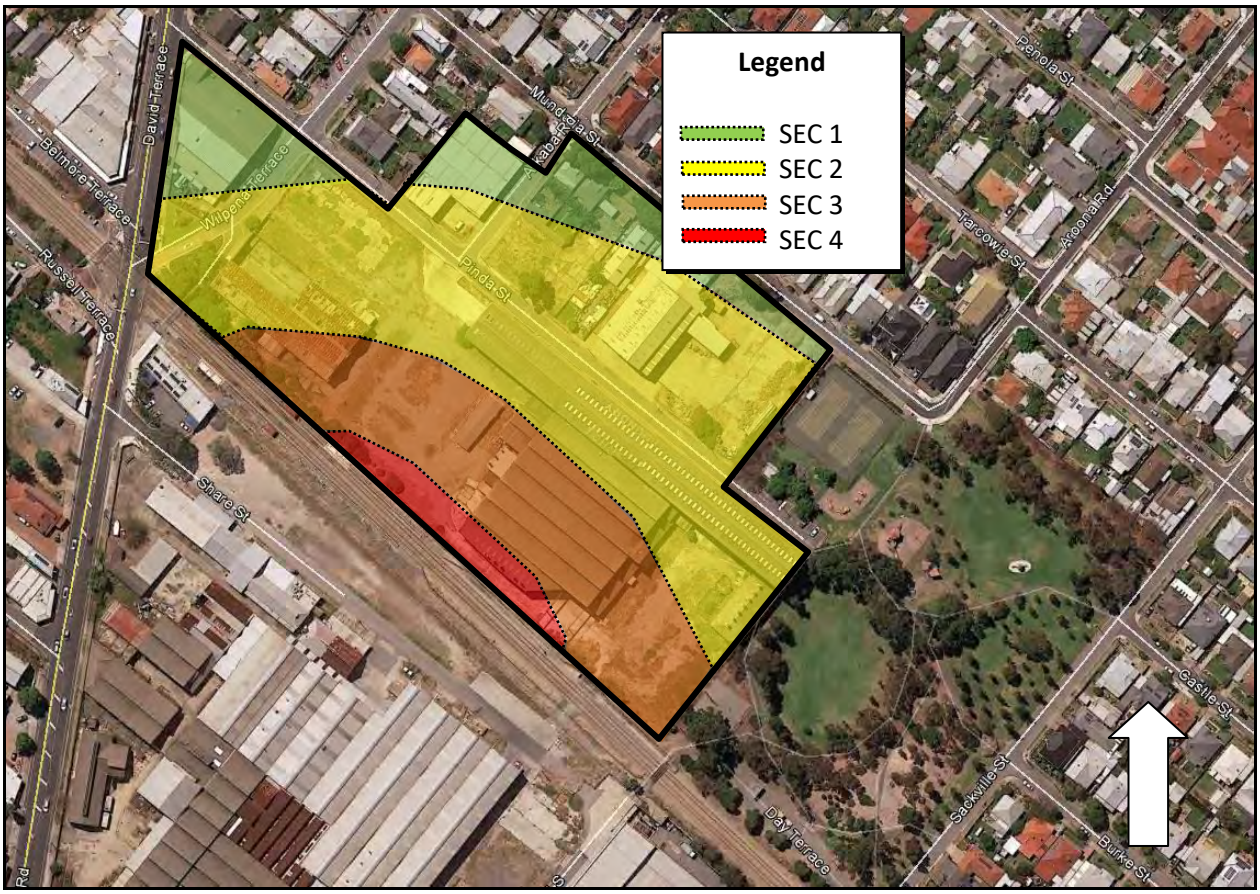
1. *Noise sensitive development designed to provide its occupants with acceptable levels of amenity when exposed to existing and envisaged future external noise sources.*
2. *Noise sensitive development that does not unreasonably interfere with the operation of existing lawful existing and envisaged future external noise sources.*

PRINCIPLES OF DEVELOPMENT CONTROL

Residential Development – Industrial Interface

1. *Residential development should incorporate facade acoustic treatments which are acoustically equivalent to the noise reduction provided by the relevant SEC in Figure X below as defined by The Minister's Specification "SA 78B – Construction requirements for the control of external sound" (SA78B). The SEC on a facade can be reduced by 1 category where that facade is shielded, as defined in SA78B, from the industrial activity to the south or south west.*

Figure X: *SECs for residential development.*



2 *External noise intrusion to private and communal open spaces (available for exclusive use by residents of each dwelling or groups of dwellings) for residential development, in the SEC 3 or 4 category in Figure X above should be shielded from the industrial activity to the south or south west. The shielding can be provided by orientation, physical structures such as wing walls or the use of existing barriers.*

In addition to the above, the following provisions are recommended:

Residential Development - Rail Corridor

Designate the rail corridor within the Air and Noise Emissions Overlay to address rail noise impacts along with the corresponding provision:

3 *Residential development should incorporate facade acoustic treatments to address rail impacts which are acoustically equivalent to the noise reduction provided by the relevant SEC in The Minister's Specification "SA 78B – Construction requirements for the control of external sound" (SA78B).*

Residential Development - Road Traffic

Designate Kilkenny Rd and David Terrace within the Air and Noise Emissions Overlay to address traffic noise impacts along with the corresponding provision:

4 *Residential development should incorporate facade acoustic treatments to address traffic impacts which are acoustically equivalent to the noise reduction provided by the relevant SEC in The Minister's Specification "SA 78B – Construction requirements for the control of external sound" (SA78B).*

Residential Development - Mixed Use Activity

Designate the subject land as a Designated Area within the Air and Noise Emissions Overlay to address mixed use activity along with the corresponding provision:

5 *Residential development should incorporate facade acoustic treatments to address mixed use activities which are acoustically equivalent to the noise reduction provided by SEC 1 in The Minister's Specification "SA 78B – Construction requirements for the control of external sound" (SA78B).*

Commercial Development – Mixed Use Activity

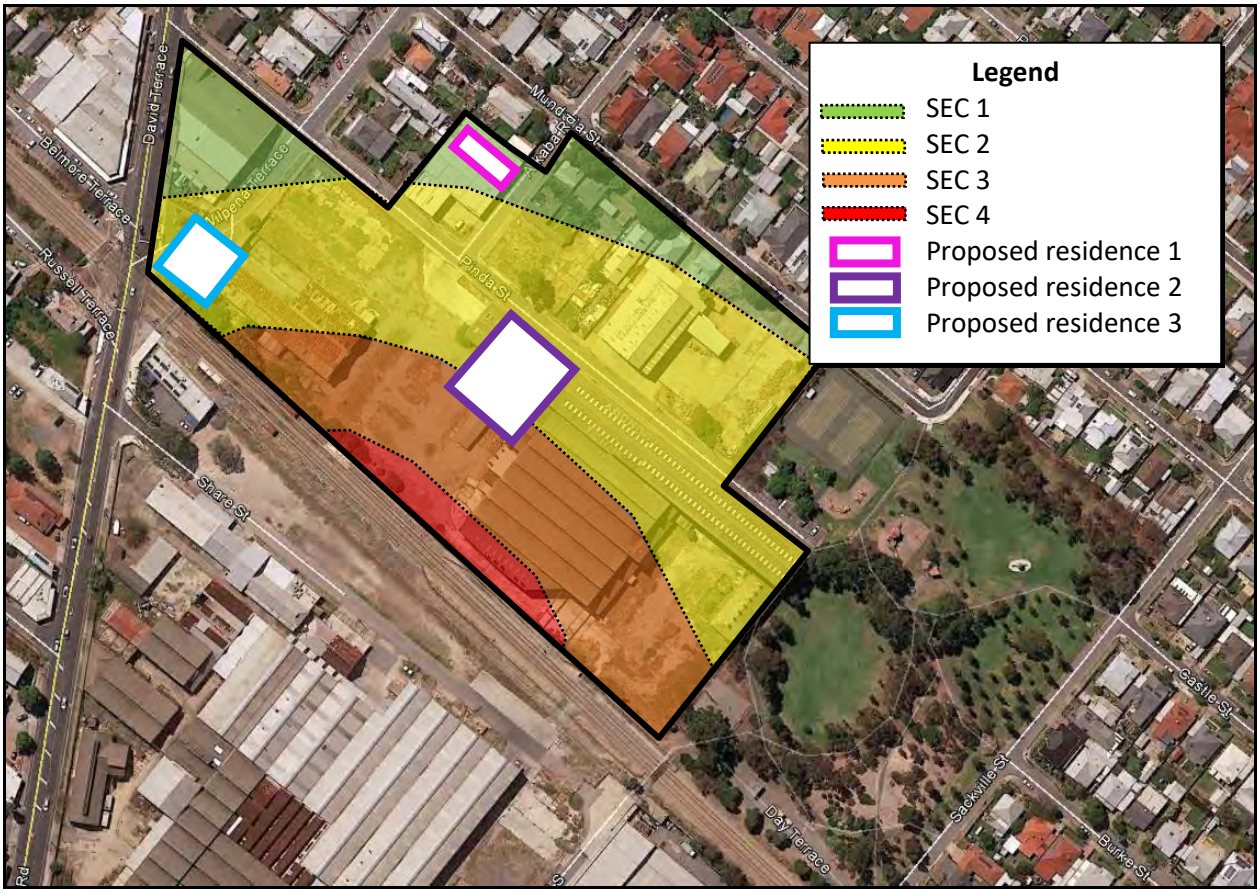
6 *Commercial development should be designed and/or sited such that noise from its operation achieves the relevant requirements of the Environment Protection (Noise) Policy 2007 at all existing dwellings, and at land in an area set aside for residential land use as its primary purpose within the Zone. When considering land in an area set aside for residential land use as its primary purpose within the Zone, achieving the internal goal noise levels of the Policy through the use of required acoustic treatments in the facade of the future dwelling/s is consistent with the Policy and this provision.*

It is noted that the above provision is similar to the existing *General Section - Interface between Land Uses PDC 8* which would also apply to all commercial development near existing residences within the zone. However, the above provision also ensures that *future* land set aside for residential land uses is not sterilised by commercial development in close proximity.

CASE STUDY

The following provides three examples of how the above provisions would apply to new multi-storey residential developments proposed within the subject area as shown in Figure 5.

Figure 5: *Case study building location*



For proposed residence 1:

- Designation under the Noise and Air Emissions Overlay would mandate the application of SA78B to address noise from road, rail, and mixed use activity. The SEC of each of the building facades would be determined in accordance with SA78B, and the corresponding required noise reduction noted (as provided in Table 1). In this circumstance, the SEC of the facades would not be affected by traffic or the rail corridor, but would be SEC 1 under Figure X (repeated as Figure 5 above). SEC 1 corresponds to a minimum noise reduction of at least 24 dB(A) for all facades.

- Appropriate acoustic treatments to achieve the minimum noise reductions could either be derived from SA78B or through acoustic design input to achieve an equivalent acoustic outcome when considering site specific factors such as layout, window areas etc. For example, in this circumstance, treatments at the southern facade would likely comprise:
    - 6.38mm thick glazing in all areas (provided the glazing was of a limited size);
    - A standard roof but with the top level ceiling constructed from 1 layer of 10mm thick plasterboard with 165mm thick insulation (with a minimum density of 7kg/m^3) laid over;
    - Masonry wall constructions or lightweight constructions incorporating multiple layers of plasterboard internally in bedrooms, and a layer of compressed fibre cement sheeting (or similar) externally;
    - Unshielded balconies on any facade.

For proposed residence 2:

- Designation under the Noise and Air Emissions Overlay would mandate the application of SA78B to address noise from road, rail, and mixed use activity. The SEC of each of the building facades would be determined in accordance with SA78B, and the corresponding required noise reduction noted (as provided in Table 1). In this circumstance, the SEC of the facades would not be affected by traffic, marginally by the rail corridor (SEC 1) and mainly by the industrial interface as per Figure X (repeated as Figure 5 above) which shows Residence 2 straddling SEC 2 and SEC 3.
- Based on the above, the facades would be:
    - To satisfy Residential Development – Industrial Interface PDC 1, the minimum required reductions would be 32 dB(A) (SEC 3) at the Sackville Street, Share Street and David Terrace facades and 28 dB(A) (SEC 2) at the Pinda Street facade;
    - As the Pinda Street facade is completely shielded from the industrial activity, the SEC can be reduced from SEC 2 to SEC 1 and standard balconies can be incorporated on this face (subject to other planning considerations).
- Appropriate acoustic treatments to achieve the minimum noise reductions could either be derived from SA78B or through acoustic design input to achieve an equivalent acoustic outcome when considering site specific factors such as layout, window areas etc. For example, in this circumstance, treatments at the southern facade would likely comprise:
    - 10.38mm thick glazing into bedrooms and 6.38mm thick glazing into living areas (provided the glazing was of a limited size);

- A standard roof but with the top level ceiling constructed from 1 layer of 16mm thick fire rated plasterboard with 165mm thick insulation (with a minimum density of 7kg/m^3) laid over;
- Masonry wall constructions or lightweight constructions incorporating multiple layers of plasterboard internally in bedrooms and multiple layers of lining externally.

- Unshielded balconies should not be provided on the Sackville Street, Share Street or David Terrace facades in accordance with Residential Development Industrial Interface PDC 2 unless direct line of sight to the industrial activities can be blocked by another building or by building design (such as utilising an indented component in the building with appropriate reflection control). Such design is likely to require input from both an acoustic engineer and architect at the planning stage of the project.

For proposed residence 3:

- Designation under the Noise and Air Emissions Overlay would mandate the application of SA78B to address noise from road, rail, and mixed use activity. The SEC of each of the building facades would be determined in accordance with SA78B, and the corresponding required noise reduction noted (as provided in Table 1). In this circumstance, the SEC of the facades would be mainly affected by traffic (SEC 4 at the NW and SW facades and SEC 3 at the others), marginally by the rail corridor (SEC 1) and marginally by the industrial interface as per Figure X (repeated as Figure 5 above) (SEC 2).
  - As the SE facade is completely shielded from traffic, the SEC can be reduced from SEC 3 to SEC 2 (or a minimum required reduction of 28 dB(A)) under PDC 4;
- Appropriate acoustic treatments to achieve the minimum noise reductions could either be derived from SA78B or through acoustic design input to achieve an equivalent acoustic outcome when considering site specific factors such as layout, window areas etc. For example, in this circumstance, treatments at the southern facade would likely comprise:
  - 12.5mm thick VLam Hush glazing, or double glazing into bedrooms and living areas (provided the glazing was of a limited size);
  - Enclosed balconies or high glass barriers where overlooking Kilkenny Road or David Terrace;
  - A standard roof but with the top level ceiling constructed from multiple layers of 16mm thick fire rated plasterboard with high density (40 kg/m^3) laid over;
  - Masonry wall constructions.

APPENDIX A: *DPA Site and nearby noise sources.*

APPENDIX B: *Example SA78B Treatments based on Sound Exposure Category.*

Table 4: *SEC 3 example treatments.*

BUILDING ENVELOPE ELEMENT	ACOUSTIC REQUIREMENTS OF SA78B		
Windows and glazed doors	***Room***	***Area of Glazing***	***Requirement***
	Bedrooms (including attached non-habitable rooms)	Restrict total glazing area to no more than 20% of the floor area	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: • minimum 10mm thick glass in sliding doors; • minimum 6.38mm thick laminated glass as fixed panes, awning, casement, or side hung doors.
	Room	***Area of Glazing***	***Requirement***
	Habitable rooms other than bedrooms (including attached non-habitable rooms)	Restrict total glazing area to no more than 40% of the floor area	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: • minimum 10mm thick glass in sliding doors; • minimum 6.38mm thick laminated glass as fixed panes, awning, casement, or side hung doors.
External walls	***Room***		
	All habitable rooms	Ensure external walls are the acoustic equivalent of a brick veneer construction incorporating: • single leaf of minimum 90mm thick brick; • a row of minimum 64mm thick studwork with minimum 25mm cavity to the brick; • 75mm thick insulation with a minimum density of 11kg/m^3 between studwork, and; • one layer of 10mm thick plasterboard fixed to the inside face.	
Roof and ceiling systems	***Room***	***Requirement***	
	Bedrooms	Ensure the roof is sheet metal or tile, and ceilings are constructed from 1 layer of 16mm thick fire rated plasterboard with 165mm thick insulation (with a minimum density of 7kg/m^3) laid over the ceiling.	
	All habitable rooms other than Bedrooms	Ensure the roof is sheet metal or tile, and ceilings are constructed from 1 layer of 10mm thick plasterboard with 165mm thick insulation (with a minimum density of 7kg/m^3) laid over the ceiling.	
Ventilation	***Room***	***Requirement***	
	All	No outside air ventilation (other than openable windows) should be provided across these facades, with the exception of outside air into a ducted system via a minimum 3m length of acoustically insulated ductwork.	
External Doors (other than external glazed doors)	***Room***	***Requirement***	
	All habitable rooms	Ensure external doors are a minimum 35mm thick solid core, fully fitted with Raven "RP8" and "RP10" (or equivalent) acoustic doors seals. These seals should be fitted and adjusted to ensure that the doors are sealed as close as practicable to airtight when closed. If a glass infill is proposed a minimum of 6.38mm thick laminated glass should be incorporated and sealed airtight into the door.	
Ground Floor	***Room***	***Requirement***	
	All habitable rooms	Ensure the dwelling is constructed on a concrete slab.	

__Table 5:__ SEC 2 example treatments.

BUILDING ENVELOPE ELEMENT	ACOUSTIC REQUIREMENTS OF SA78B		
Windows and glazed doors	***Room***	***Area of Glazing***	***Requirement***
	Bedrooms (including attached non-habitable rooms)	Restrict total glazing area to no more than 40% of the floor area	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: • minimum 10mm thick glass in sliding doors; • minimum 6.38mm thick laminated glass as fixed panes, awning, casement, or side hung doors.
Windows and glazed doors	***Room***	***Area of Glazing***	***Requirement***
	Habitable rooms other than bedrooms (including attached non-habitable rooms)	Restrict total glazing area to no more than 60% of the floor area	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: • minimum 10mm thick glass in sliding doors; • minimum 6.38mm thick laminated glass as fixed panes, awning, casement, or side hung doors.
External walls	***Room***		
	All habitable rooms	Ensure external walls are the acoustic equivalent of a brick veneer construction incorporating: • single leaf of minimum 90mm thick brick; • a row of minimum 64mm thick studwork with minimum 25mm cavity to the brick; • 75mm thick insulation with a minimum density of 11kg/m^3 between studwork, and; • one layer of 10mm thick plasterboard fixed to the inside face.	
Roof and ceiling systems	***Room***	***Requirement***	
	Bedrooms	Ensure the roof is sheet metal or tile, and ceilings are constructed from 1 layer of 10mm thick plasterboard with 165mm thick insulation (with a minimum density of 7kg/m^3) laid over the ceiling.	
Ventilation	***Room***	***Requirement***	
	All	No outside air ventilation (other than openable windows) should be provided across these facades, with the exception of outside air into a ducted system via a minimum 3m length of acoustically insulated ductwork.	
External Doors (other than external glazed doors)	***Room***	***Requirement***	
	All habitable rooms	Ensure external doors are a minimum 35mm thick solid core, fully fitted with Raven "RP8" and "RP10" (or equivalent) acoustic doors seals. These seals should be fitted and adjusted to ensure that the doors are sealed as close as practicable to airtight when closed. If a glass infill is proposed a minimum of 6.38mm thick laminated glass should be incorporated and sealed airtight into the door.	
Ground Floor	***Room***	***Requirement***	
	All habitable rooms	Ensure the dwelling is constructed on a concrete slab.	

Table 6: *SEC 1 example treatments.*

BUILDING ENVELOPE ELEMENT	ACOUSTIC REQUIREMENTS OF SA78B		
Windows and glazed doors	***Room***	***Area of Glazing***	***Requirement***
	Bedrooms (including attached non-habitable rooms)	Restrict total glazing area to no more than 40% of the floor area	Ensure a minimum 6.38mm thick laminated glass is incorporated into systems that can be sealed airtight when closed.
Windows and glazed doors	***Room***	***Area of Glazing***	***Requirement***
	Habitable rooms other than bedrooms (including attached non-habitable rooms)	Restrict total glazing area to no more than 60% of the floor area	Ensure a minimum 6.38mm thick laminated glass is incorporated into systems that can be sealed airtight when closed.
External walls	***Room***	***Requirement***	
	All habitable rooms	Ensure external walls are the acoustic equivalent of: • brick veneer construction incorporating: ○ single leaf of minimum 90mm thick brick; ○ a row of minimum 64mm thick studwork with minimum 25mm cavity to the brick; ○ 75mm thick insulation with a minimum density of 11kg/m^3 between studwork, and; ○ one layer of 10mm thick plasterboard fixed to the inside face. OR; • Hebel construction incorporating: ○ a row of minimum 90mm thick timber studwork; ○ 75mm thick Hebel Powerpanel fixed to the studwork with minimum 22mm thick battens ○ 90mm thick insulation with a density of 10.5kg/m^3 between the studwork, and; ○ one layer of 10mm plasterboard fixed to the inside face.	
Ventilation	***Room***	***Requirement***	
	All	No outside air ventilation (other than openable windows) should be provided across these facades, with the exception of outside air into a ducted system via a minimum 3m length of acoustically insulated ductwork.	

APPENDIX C: Indicative subject site layout plan.

Appendix D – Infrastructure Assessment, KBR

186 Greenhill Road | Parkside SA 5063 | Australia
GPO Box 2702 | Adelaide SA 5001 | Australia
Phone: +61 8 8301 1234 | Fax: +61 8 8301 1301

AEG857-C1 -S00006
JG: jm

20 February 2019

Mr David Barone
Jensen PLUS
Level 1, 21 Roper Street
ADELAIDE SA 5000
AUSTRALIA

Dear David

KILKENNY
DEVELOPMENT PLAN AMENDMENT

Kellogg Brown and Root Pty Ltd (KBR) has been engaged by Jensen PLUS to undertake preliminary infrastructure investigations to aid in the preparation of a draft Development Plan Amendment (DPA) for the proposed development located at Kilkenny on behalf of the City of Charles Sturt (Council).

The capacity of the existing stormwater system and flood susceptibility of the subject and surrounding land has been investigated based on criteria set by Council.

KBR have approached service authorities for feedback and advice on the capacity of utility infrastructure and to identify any need for upgrades to accommodate the proposed development. The advice should be considered high level and should be confirmed when specifics of the proposal can confirm actual demands and development layout. .

FLOODING AND STORMWATER MANAGEMENT

Preliminary hydrological calculations were undertaken using DRAINS to determine whether or not onsite detention is required for the post-development scenario. Council has prescribed that the pre-development flows for the 0.2 EY (1 in 5 Year ARI) cannot be exceeded by the post-development flows for the 1% AEP event (1 in 100 Year ARI).

The development is at the top of the stormwater system which flows toward and into the Torrens Road main drain via pit and pipe infrastructure. There is existing stormwater pit and pipe infrastructure adjacent the development in both Pinda Street and Mundulla Street. The site drains towards the north-eastern corner of the development and Council have advised that an ideal connection location would be at the junction box at the intersection of Pinda Street and Wilpena Terrace which is believed to be approximately 1.4 m deep. Depths of the existing infrastructure will require confirmation.

Analysis has assumed two catchments which generally follow existing flow paths; a small catchment draining towards the corner of Arkaba Road and Pinda Street, and the other draining towards the corner of Pinda Street and Wilpena Terrace consistent with contour maps provided by Council.

The results of the hydrological calculations indicate that onsite detention of approximately 650 m^3 is required to meet Council's criteria as summarised in the below table.

Catchment	Area	Pre-development 0.2EY	Post-development 1% AEP	Storage Required
Arkaba Road	0.82 ha	92 L/s	235 L/s	143 m^3
Pinda Street	3.01 ha	290 L/s	651 L/s	504 m^3

Hydraulics of both of these connections needs to be investigated and confirmed during detailed design. The attached sketch summarises how KBR envisage the proposed development draining.

The 143 m^3 of detention required for the Arkaba Road catchment could be attained by installing approximately 130 m of 900 mm x 1200 mm reinforced concrete box culverts along a potential laneway between Mundulla Street and Pinda Street that would connect to the infrastructure in Pinda Street. The 504 m^3 of detention required for the Pinda Street catchment could be attained by a detention basin, an underground tank, or a combination of noting that the bioretention system (discussed below) could account for some of the detention volume. A basin needs to discharge at this location but can generally take a shape to fit within open space or plaza areas.

The principal of Water Sensitive Urban Design (WSUD) is to be utilised to ensure that runoff generated by the proposed development is treated within the site before being discharged into the existing Council drainage network. Assuming a filter depth of 0.5 m, approximately 250 m^2 of bioretention is required to meet the following criteria; 80% reduction of total suspended solids, 60% reduction of total phosphorous and 45% reduction of total nitrogen. The bioretention area could be reduced with an oil and sediment trap. This could be achieved by multiple small ponds at inlet pits or a larger pond incorporated into the detention basin.

Flood map information provided by Council indicate that the development is not affected by flooding from external catchments as flows are well maintained within the road reserves of Mundulla Street, Pinda Street, Arkaba Road and Wilpena Terrace. KBR recommend that the finished floor level of the proposed buildings within the development be 300 mm above the top of kerb level, this is to be confirmed following site survey. Flow paths within the development will need to ensure safe conveyance of major flows and capture into the proposed detention facilities.

INFRASTRUCTURE ANALYSIS

Service authorities have been consulted regarding infrastructure capacity in the vicinity of the site. Correspondence is attached for reference and summarised below.

Potable Water

SA Water have advised that the network has sufficient capacity (meeting minimum levels of service at the customer meter) to support the development however approximately 340 m of the existing 100 AC main in Pinda Street will need to be abandoned and relayed with a new DN 200 main. The existing main size in Pinda Street is not compliant with current standards for a high residential (≥ 4 storey) development which requires a minimum DN 150 supply main.

Dependent on the development layout, fire service requirements and pressure requirements for multi storey buildings will need to be analysed further.

Sewer

SA Water have advised that sewer can be provided to the development subject to commercial activities having a coverage area of less than 0.1 ha. If the development were to have a higher commercial area coverage or if commercial loadings were to generate higher sewer discharge than generic values, then further analysis will be required.

SA Water have assumed that the Aroona Road sewer main is the receiving sewer main of all the commercial discharges. On this basis, and dependent on the development layout, SA Water estimate that approximately 450 m of existing DN 150 main will need to be upgraded to a DN 225 main. The existing sewer main in Aroona Road is a DN 150 main upstream of Margaret Avenue, which is not suitable for commercial land use.

Electricity

SA Power Networks have advised that standard augmentation rates would apply as the Kilkenny substation has adequate spare capacity, and that no additional zone substation or sub-transmission line augmentation would apply. Refer attached correspondence for details.

There are two 11 kV HV feeders on the boundary of this development which would be the connection points for this development. SA Power Networks have requested that the total load for the development be split across each of the following 11 kV feeders.

- Feeder AP-372D David Terrace
- Feeder AP-372F Aroona Road

Gas

APA have advised that the existing 200SP gas main in Aroona Road will support the loads of both residential and commercial properties. Any possible headwork can only be confirmed following the review of a concept plan.

Communications

NBN Co. have advised that they will be able to supply new dwellings with Fibre to the Premises under their new development program.

On the basis of enquiries to date and advice offered by the relevant service authorities, the proposed development can be serviced by potable water, sewer, electricity, gas and telecommunications.

If you have any queries regarding the above, please do not hesitate to contact me on 8301 1274.

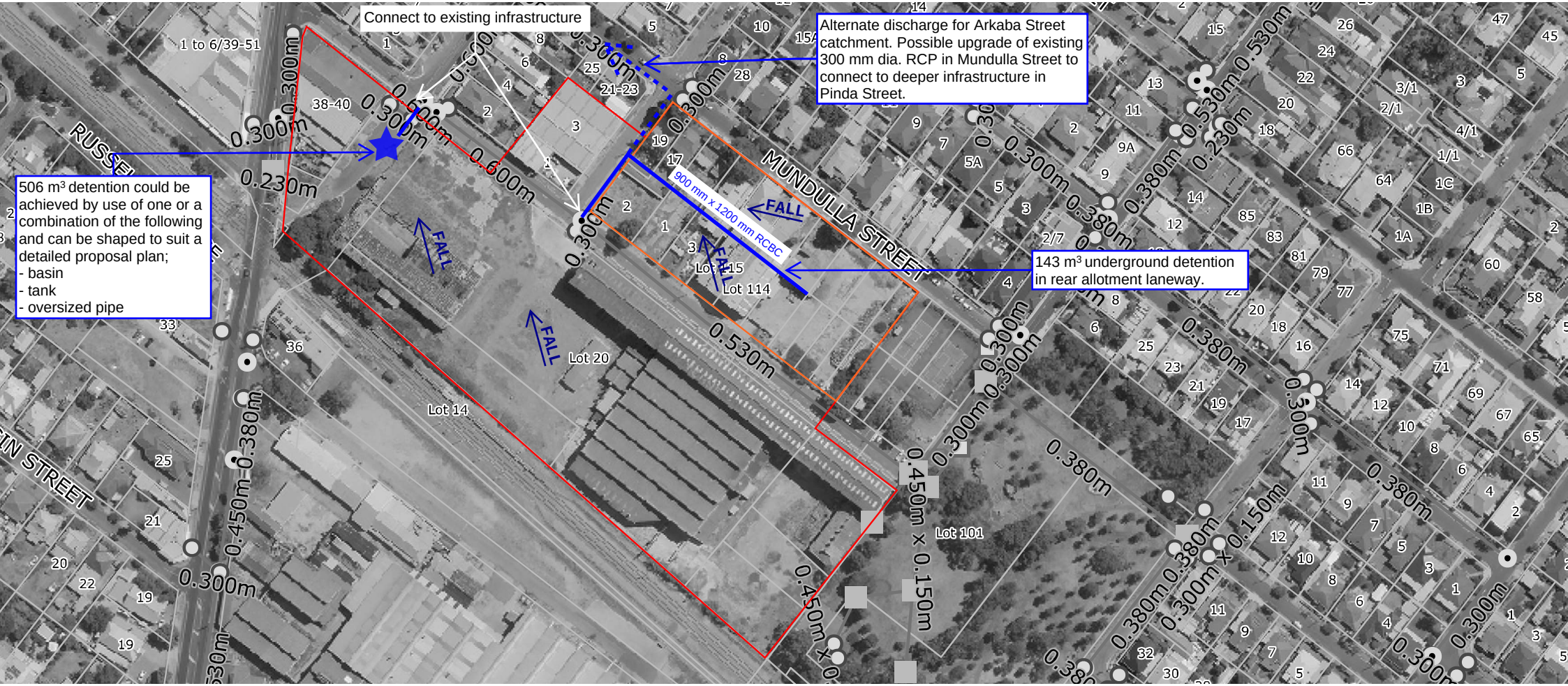
Yours sincerely

Jenna Grosser
Civil Engineer

Enclosure

- Proposed site drainage plan
- Service authority correspondence

PROPOSED SITE DRAINAGE



N

Jenna Grosser

Subject: FW: Kilkenny Mixed Use DPA - SA Water - H0072226

From: Stanway, Craig [mailto:Craig.Stanway@sawater.com.au]
Sent: Thursday, February 7, 2019 12:43 PM
To: Jenna Grosser <Jenna.Grosser@kbr.com>
Cc: db@jensenplus.com.au
Subject: [External] FW: Kilkenny Mixed Use DPA - SA Water - H0072226

Hi Jenna,

Based on the information provided to SA Water for this proposed DPA at Kilkenny, please see the response below:

Water

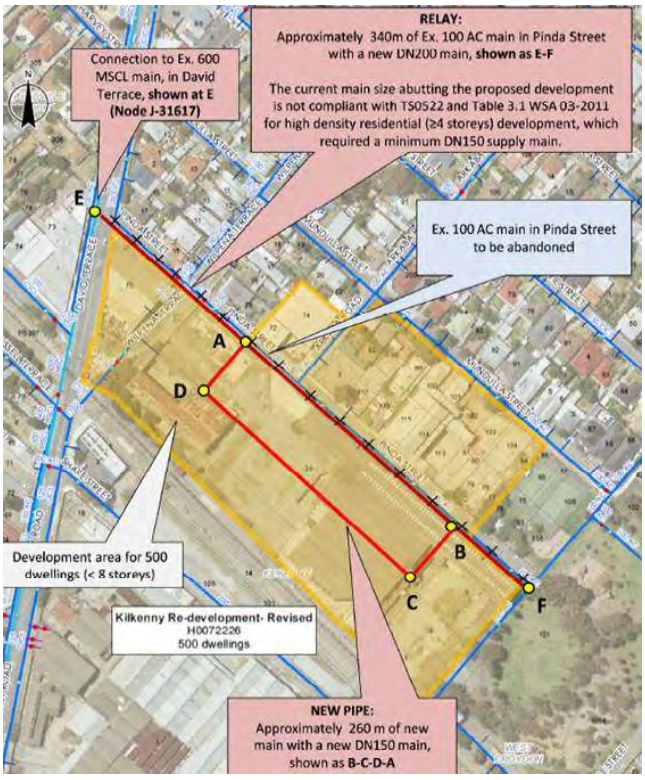
Based on TNP investigation, the network has sufficient capacity (meet minimum levels of service at customer meter) to support the 500 dwelling development subject to:

· Relaying of approximately 340m of Ex.100 AC main in Pinda Street with a new a DN200 main, **shown as E-F on Figure 1.**

· Construct a new ring main subject to final lot layout using DN150 main (**shown as B-C-D-A in Figure 1**). Approximate distance 260 m. Any buildings 8 storeys or higher will require a connection from a DN200 main as per WSA code.

· Ex.100 AC main in Pinda Street to be abandoned and existing branches and services (to remain) to be re-connected back into new DN200 main.

· All meters for unit complexes to be connected to either the new DN200 main in Pinda Street or to the new DN150 pipe **shown as B-C-D-A in Figure 1**.



Fire service
· Fire flow analysis to be undertaken separately
· Details of fire service requirements or location not provided

Inline pumps
· Inline pumps permit application to be undertaken separately

Sewer

Wastewater services can be provided to this development subject to:

- Commercial activities are no greater than an assumed 0.1 Ha site coverage area otherwise higher commercial area coverage or commercial loadings generating higher sewage discharges than generic values will require a revisit.

- Installation of a minimum DN150 connection to any Commercial land use activities.

- Approx. 450m of DN150 main will need to be upgraded to DN225 main. Exact distances will depend of the final development plan layout. To note this is on the basis that the Aroona Av sewage main is the receiving sewage main of all of the commercial discharges.

Existing services
Any existing services no longer required would need to be cut off at the applicant / developer's cost.

Recycled Water
The Corporation's recycled water supply system is not available to the subject land.

Trade Waste
The above advice does not include any trade waste permit requirements – for further information please contact the Trade Waste Group on 7424 1336.

The Corporation's requirements would be confirmed upon receipt of the plan of division from DAC or application(s) for connection.

If you have any questions on the matter, please let me know.

Regards,

Craig Stanway
Senior Major Development Officer

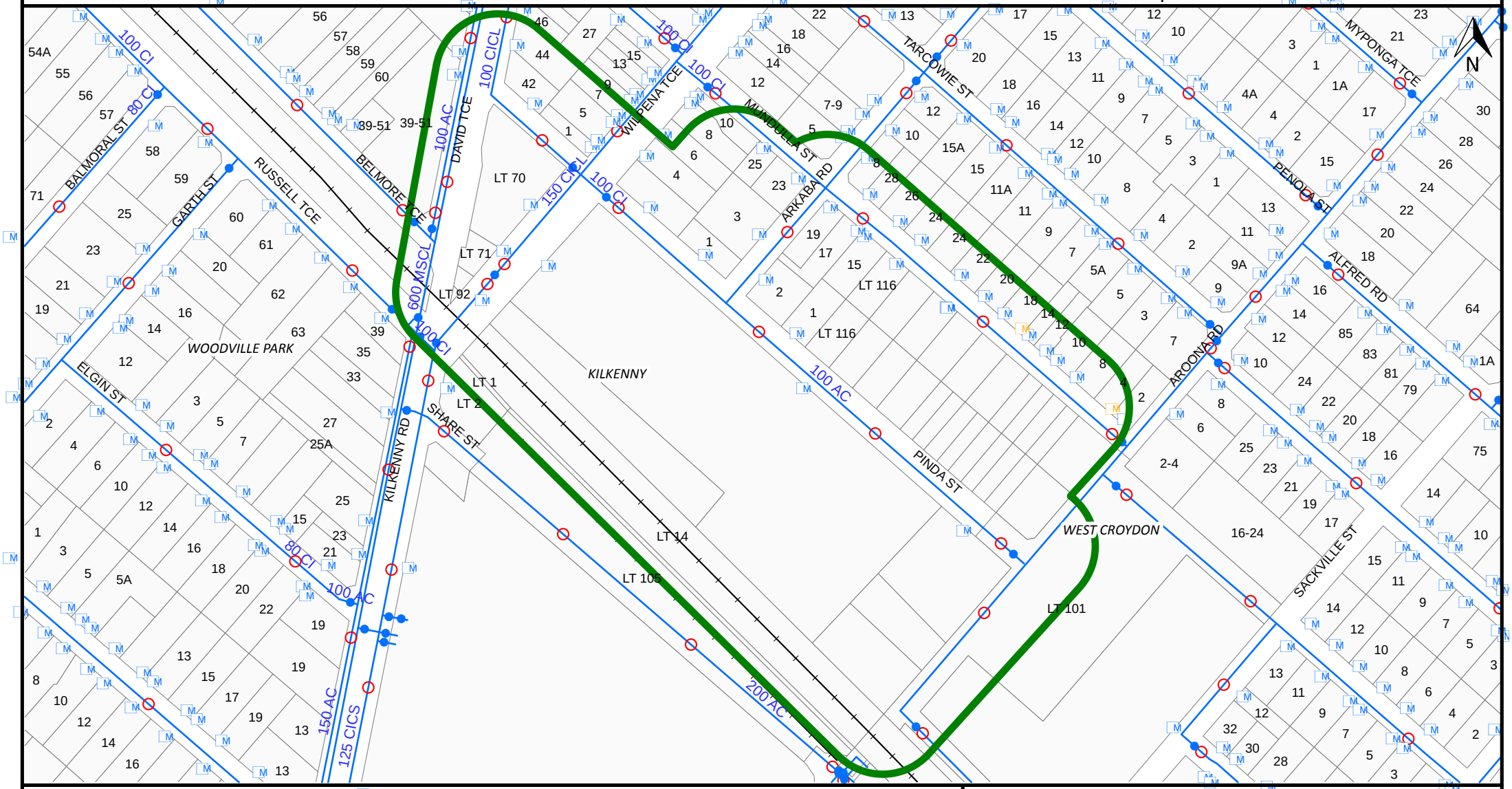
craig.stanway@sawater.com.au • **7424 1837**
250 Victoria Square/Tarntanyangga ADELAIDE SA 5000

South Australian Water Corporation

WATER RETICULATION

DBYD Sequence No: **78463336**

Map Tile: 1



- Water Valves
- Water Main
- Water Main (Decommissioned)
- Decommissioned Asbestos Mains
- Water Pillar Hydrant
- Water Hydrant
- CP Facility
- CP = Cathodic Protection
- CP Anode/Cathode Cables
- CP Electricity Supply Cables
- CP Anode Bed Outlines
- Railway
- Land Parcels
- Water Meter*
- Shifted Water Meter*

** Connection between water meter and pipe not shown*

Scale @ A4: 1:2500

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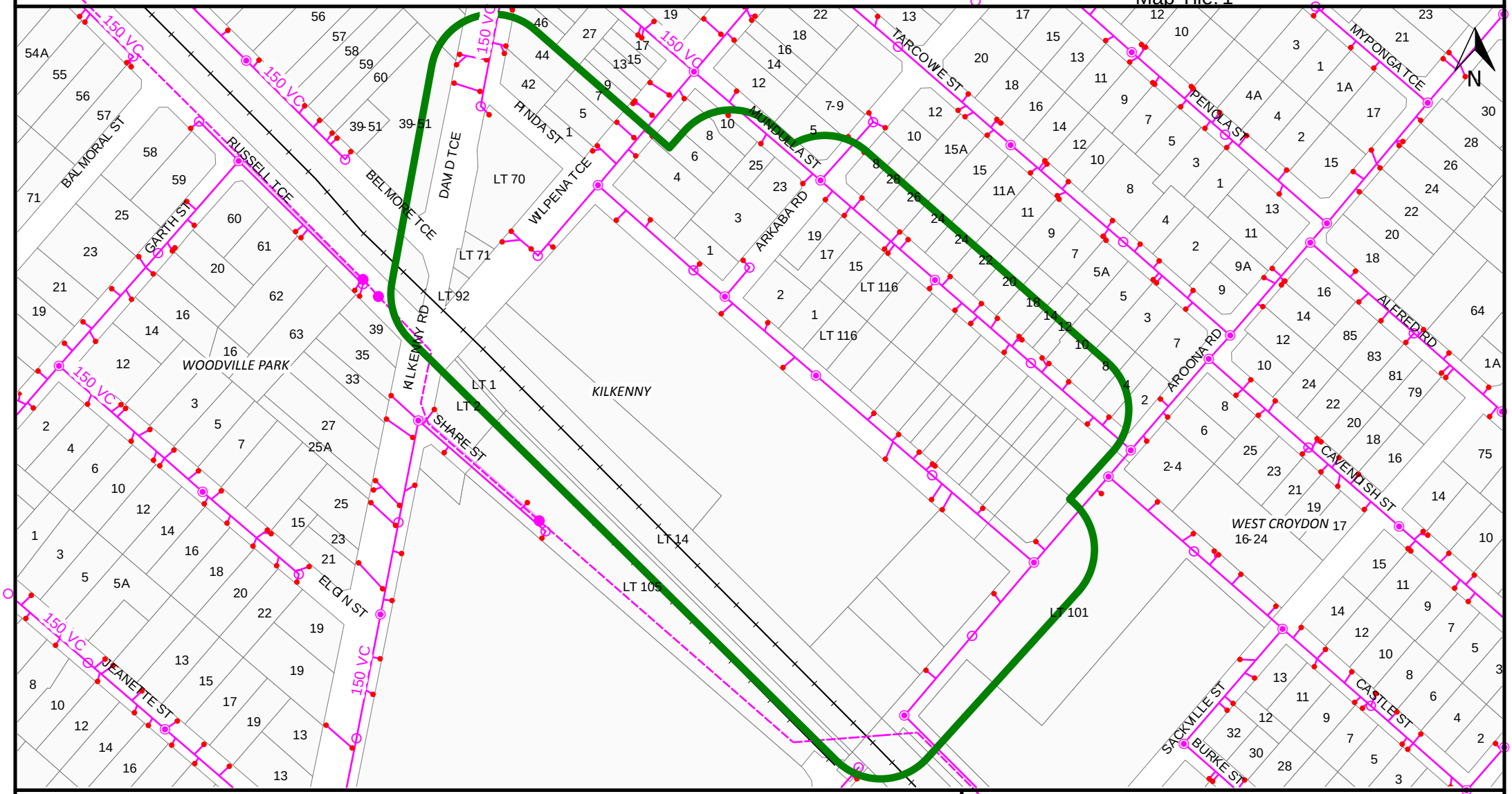
South Australian Water Corporation

WASTEWATER RETICULATION

DBYD Sequence No: **78463336**

Map Tile: 1



- GIP
- Valve
- Maintenance Hole
- Maintenance Shaft
- Inspection Opening
- Wastewater Connections
- Decommissioned Asbestos Mains
- Ancillary Pipes
- Gravity Mains
- Low Pressure
- Pumping Mains
- Vacuum Mains
- Railway
- Land Parcels
- CP Facility
- CP Anode/Cathode Cables
- CP Electricity Supply Cables
- CP Anode Bed Outlines

CP = Cathodic Protection

Scale @ A4: 1:2500

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Jenna Grosser

From: David Pickard <David.Pickard@sapowernetworks.com.au>
Sent: Tuesday, January 22, 2019 10:42 AM
To: Jenna Grosser
Subject: [External] Kilkenny Mixed Use DPA - SA Power Networks
Attachments: TS100 Electrical Design Standard for Underground Distribution Cable Networks (up to and including 33kV).pdf; SA Power Networks Customer Connections..pdf; SA Power Networks Connection Policy for 2015 - 2020.pdf

Morning Jenna

I have been assigned to this project, so I'll be the contact as this job progresses.

I can give the following advice regarding your enquiry.

Kilkenny substation has adequate spare capacity, so standard augmentation rates would apply (see attached SA Power Networks Customer Connections PDF). No additional Zone Substation or Sub-transmission line augmentation would apply.

There are 2 11kV HV feeders which boundary this property which would be the connection points for this development

- Feeder AP-372D David Terrace 11kV Feeder, with a connection point on David Terrace, and
- Feeder AP-372F Aroona Road 11kV Feeder, with a connection point on Aroona Road.

We would request that the total load be split across each 11kV feeder, with an open point between these 2 Feeders. HV Cable would be 300mm² or 630mm² Aluminium XLPE

The cost of the project would be Construction Costs (Extension of the Network) + Augmentation Charge (example below) – Rebates.

Construction costs – we would be able to estimate a cost of the extension once we have a design. This development could be constructed contestably, then SA Power Networks would test, connect and energise the extension.

Augmentation Charge - Assuming on average 5kVA per dwelling and guess of 1000kVA for commercial, then requested demand is 5 x 509 + 1,000 = 3,545kVA. For this site and estimated load, standard augmentation charges applies. Residential: $235 x 2,545 = $598,075, Commercial = $162 x 1,000 = $162,000. Total Augmentation = $760,075

Rebates – Rebates for serviced real estate developments will be the forecast *incremental revenue* based on the following factors:

- specified ADMD
- known spot-loads
- possibility of alternative energy sources (eg PV or gas); and
- likely take-up rate of the development for the period used to determine the IR.

This information is in our connection policy.

There is an existing ground level transformer on Pinda Street, as well as various HV and LV infrastructure on the proposed site. We could give you an offer to remove any assets which may be redundant.

SA Power Networks has made assumptions with best intentions on both the scope and line route that may be available or suitable. This response is based on the information that you have provided to SA Power Networks and, as such, if this information is incomplete or inaccurate, SA Power Networks reserves the right to vary its assessment of the requirements for the construction works.

All design and construction work most comply with applicable SA Power Networks Technical Standards, Specifications, Policies and Procedures. refer to our Connection Policy for additional information.

Please contact me if you have any further questions

Regards,

David Pickard
Network Project Officer

Phone: 08 8404 4550
Mobile: 0447 608 053
David.Pickard@sapowernetworks.com.au
---
12 Senna Road, Wingfield SA 5013
www.sapowernetworks.com.au

SA Power Networks

****
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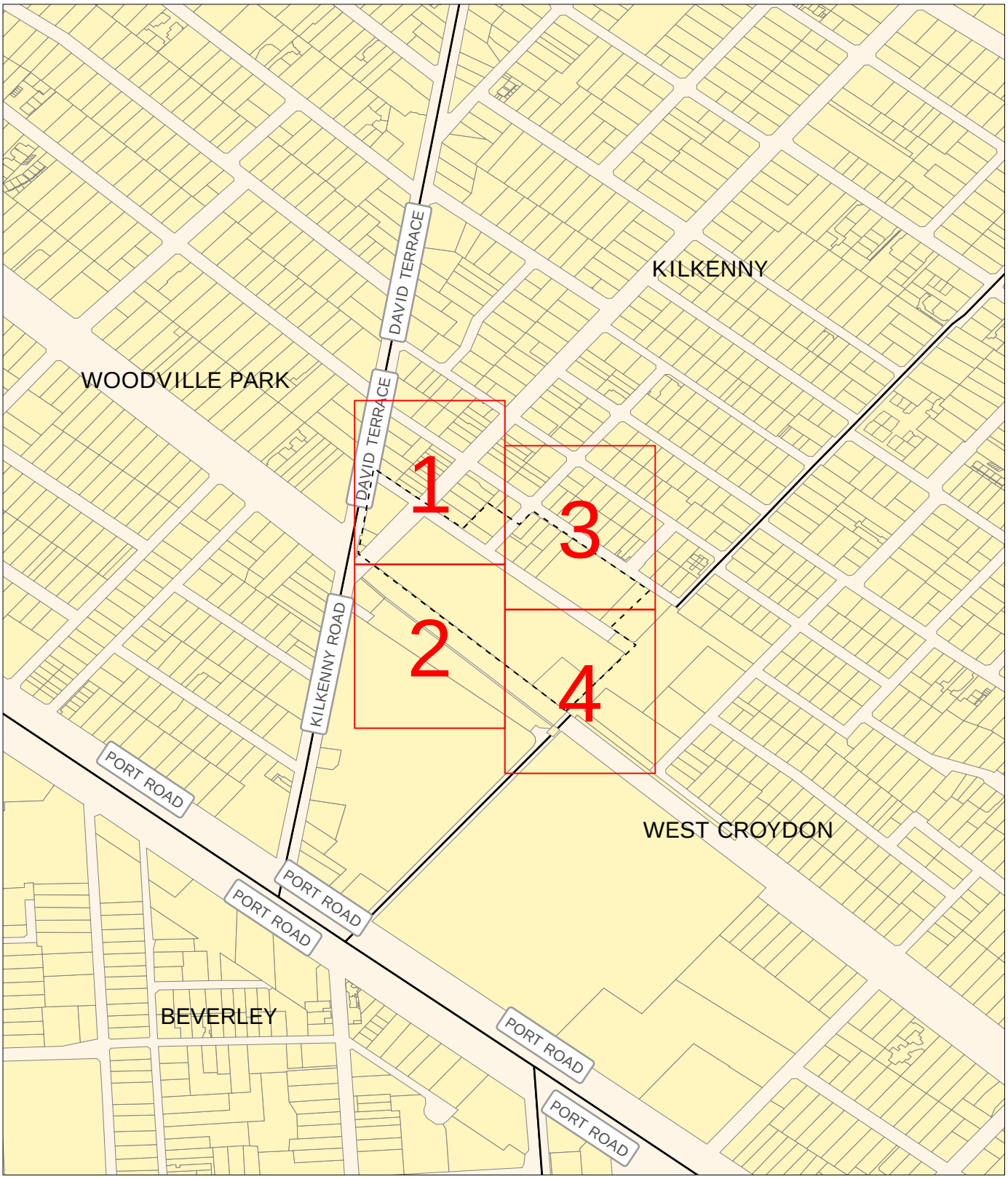
****

Overview Map

Sequence No: 78463331

David Terrace Adelaide



Disclaimer: The Plan/Sketch is supplied at your request and is subject to your agreement that SA Power Networks shall not be liable or responsible for the correctness or otherwise of any such information supplied pursuant to this request. Upon acceptance of this condition SA Power Networks grants you permission to use the Plan/Sketch as a guide to the location of SA Power Networks assets. The Plan/Sketch must be returned to SA Power Networks if you fail to accept the conditions of use.

N

0 0.06km

LEGEND:

1 Detail Map

DBYD Requested Area

Powered by dbyd

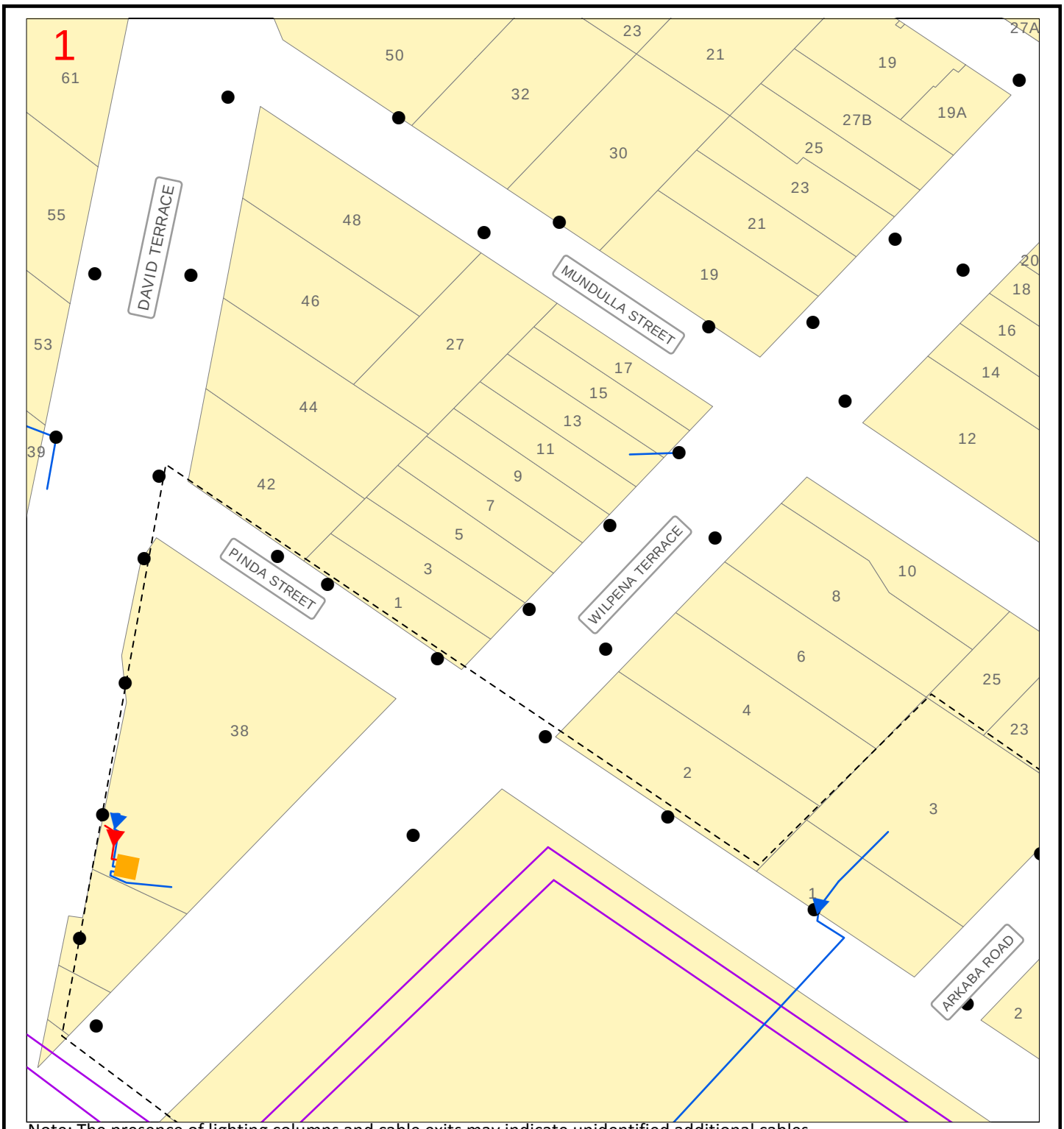
Date: 11/12/2018

SA Power Networks

Map 1

Sequence No: 78463331

David Terrace Adelaide



Note: The presence of lighting columns and cable exits may indicate unidentified additional cables.

LEGEND:

Cable Exits	Cables		
66kV/132kV	66kV/132kV	DBYD Requested Area	Fibre Optic Cable/Duct
33kV	33kV	HV Switching Cubicle	Fibre Manhole/Pit
19kV	19kV	Transformer Cubicle	Pilot Cable
11kV	11kV	Cable Joint Bay	Pilot Manhole/Pit
7.6kV	7.6kV	LV Switching Cubicle/Pit	Substation
Not In Service	Not In Service	Service Pit/Pillar	Electricity Pole
Low Voltage	Low Voltage	Earthing Grid	Light Column

N

0 0.009km

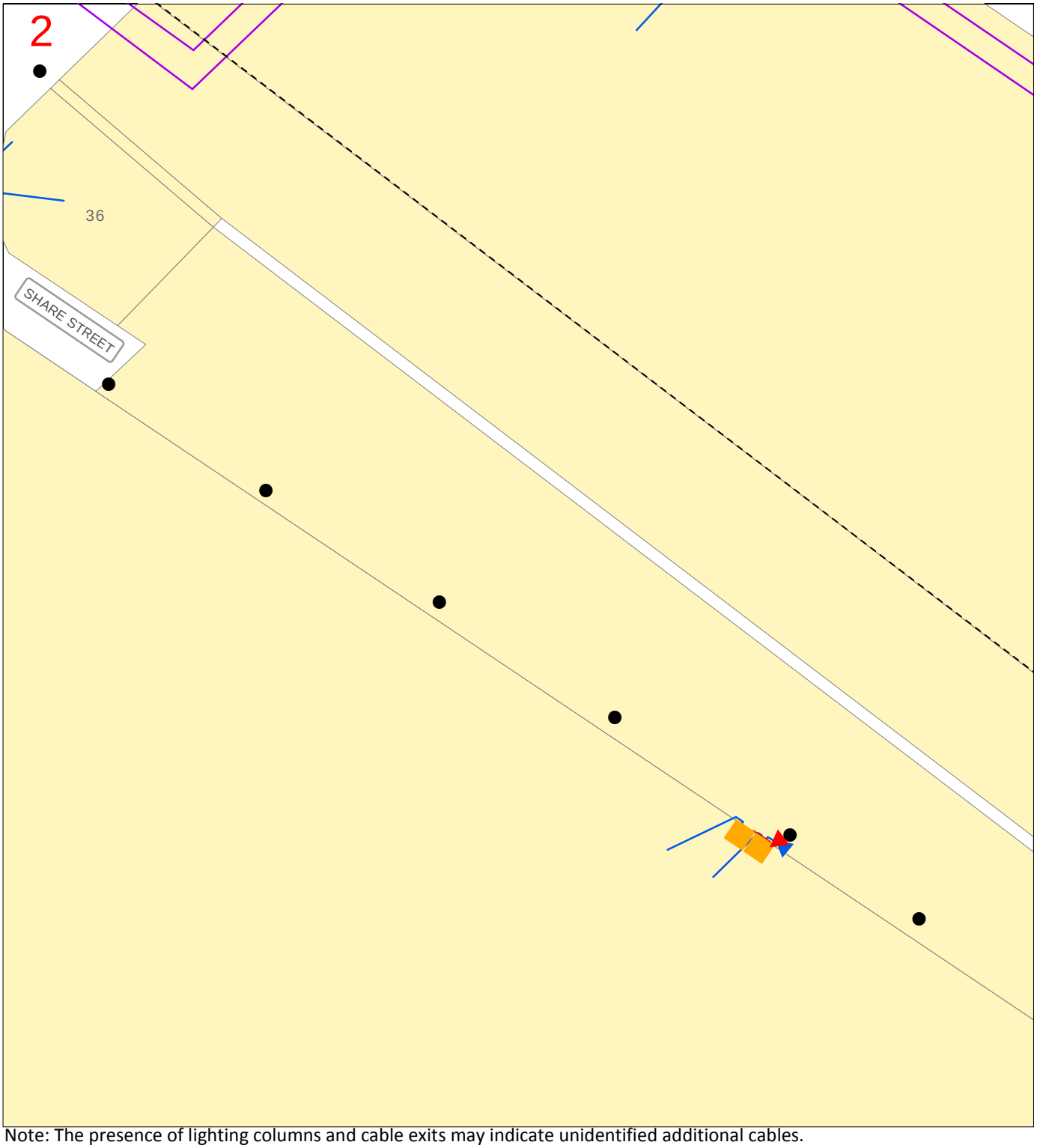
Powered by x-info dbyd

SA Power Networks

Map 2

Sequence No: 78463331

David Terrace Adelaide



Note: The presence of lighting columns and cable exits may indicate unidentified additional cables.

LEGEND:

Cable Exits	Cables		
66kV/132kV	66kV/132kV	DBYD Requested Area	Fibre Optic Cable/Duct
33kV	33kV	HV Switching Cubicle	Fibre Manhole/Pit
19kV	19kV	Transformer Cubicle	Pilot Cable
11kV	11kV	Cable Joint Bay	Pilot Manhole/Pit
7.6kV	7.6kV	LV Switching Cubicle/Pit	Substation
Not In Service	Not In Service	Service Pit/Pillar	Electricity Pole
Low Voltage	Low Voltage	Earthing Grid	Light Column

N

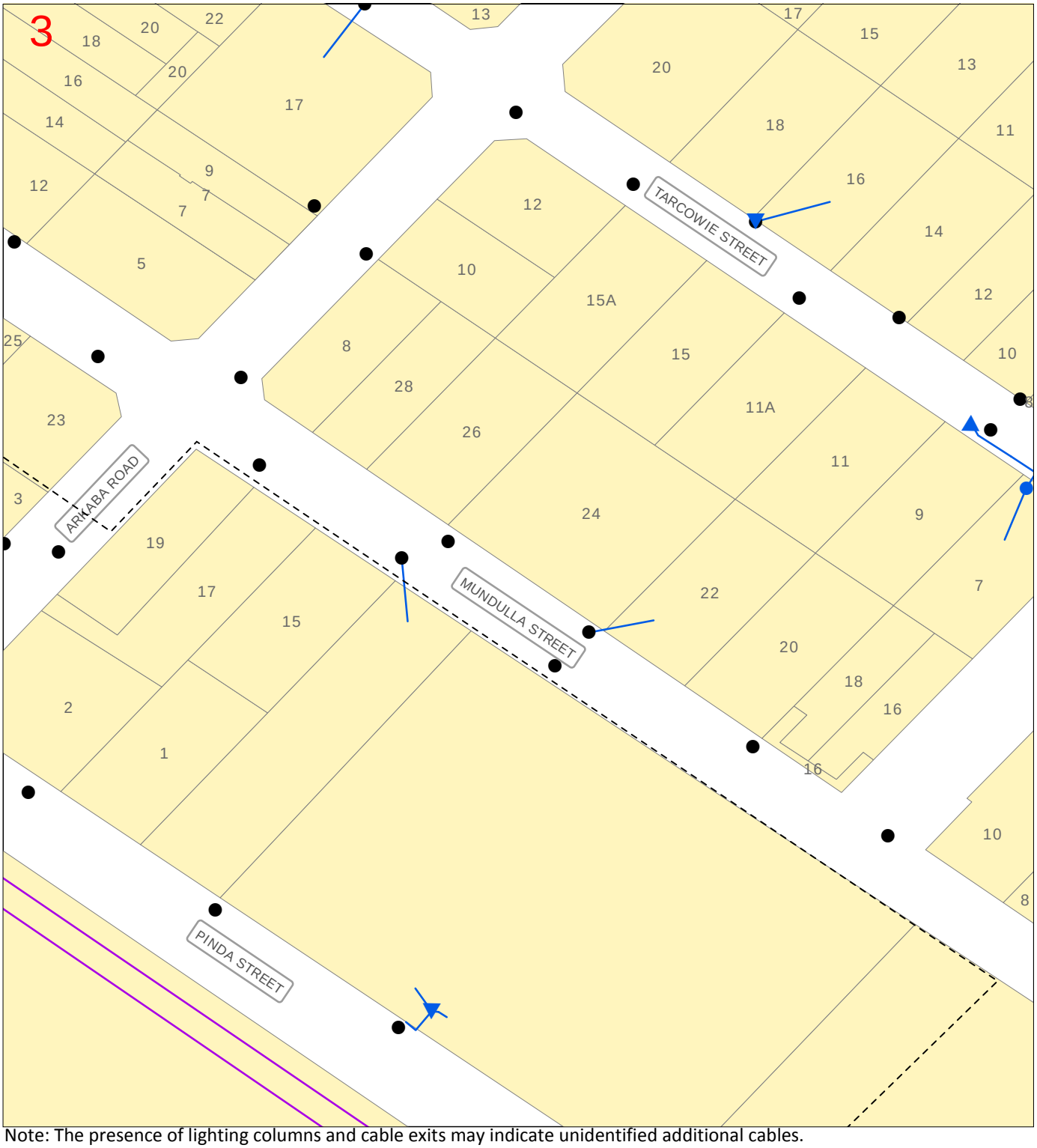
0 0.009km

SA Power Networks

Map 3

Sequence No: 78463331

David Terrace Adelaide



Note: The presence of lighting columns and cable exits may indicate unidentified additional cables.

LEGEND:

Cable Exits	Cables		
66kV/132kV	66kV/132kV	DBYD Requested Area	Fibre Optic Cable/Duct
33kV	33kV	HV Switching Cubicle	Fibre Manhole/Pit
19kV	19kV	Transformer Cubicle	Pilot Cable
11kV	11kV	Cable Joint Bay	Pilot Manhole/Pit
7.6kV	7.6kV	LV Switching Cubicle/Pit	Substation
Not In Service	Not In Service	Service Pit/Pillar	Electricity Pole
Low Voltage	Low Voltage	Earthing Grid	Light Column

N

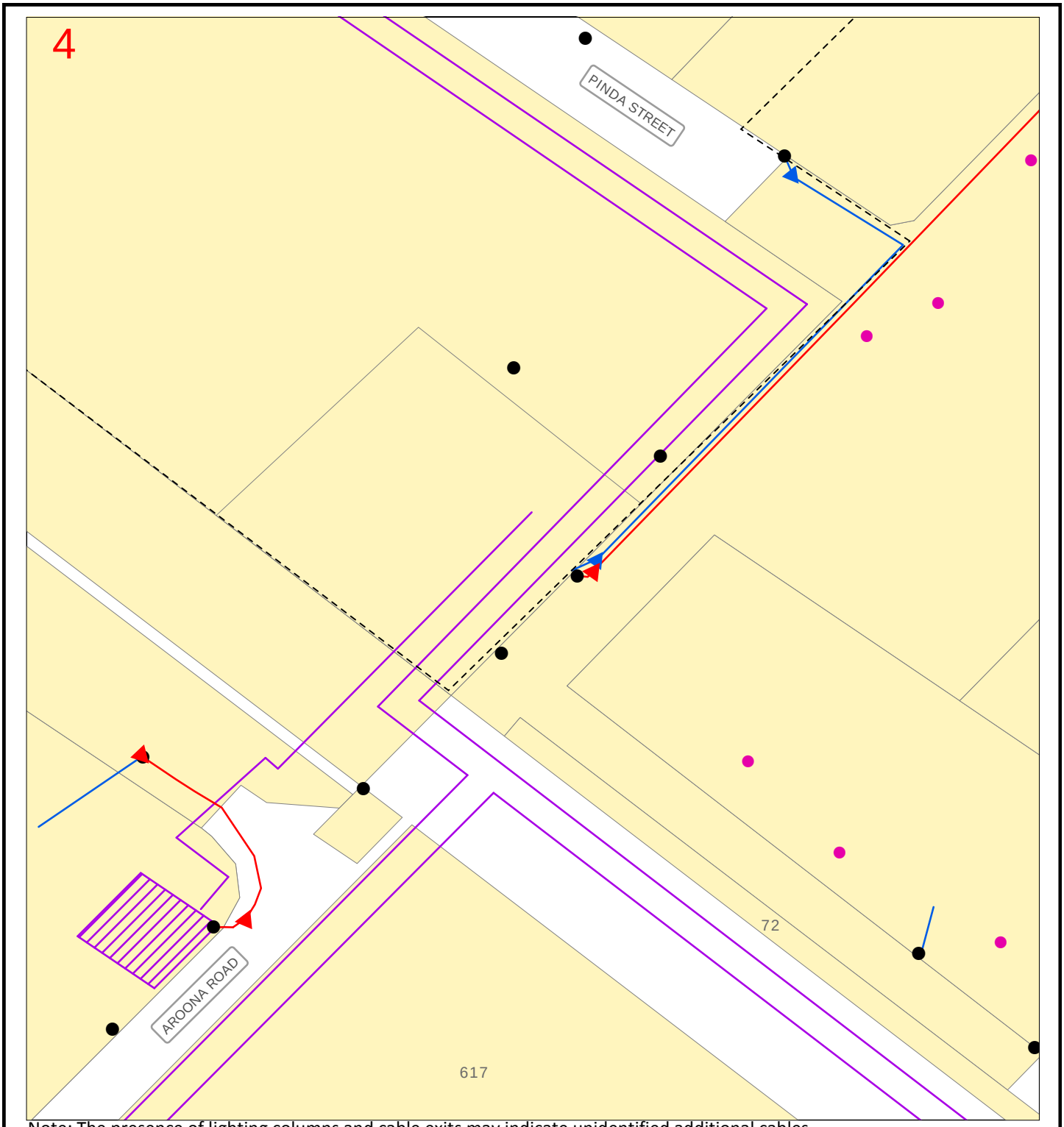
0 0.009km

SA Power Networks

Map 4

Sequence No: 78463331

David Terrace Adelaide



Note: The presence of lighting columns and cable exits may indicate unidentified additional cables.

LEGEND:

Cable Exits	Cables		
66kV/132kV	66kV/132kV	DBYD Requested Area	Fibre Optic Cable/Duct
33kV	33kV	HV Switching Cubicle	Fibre Manhole/Pit
19kV	19kV	Transformer Cubicle	Pilot Cable
11kV	11kV	Cable Joint Bay	Pilot Manhole/Pit
7.6kV	7.6kV	LV Switching Cubicle/Pit	Substation
Not In Service	Not In Service	Service Pit/Pillar	Electricity Pole
Low Voltage	Low Voltage	Earthing Grid	Light Column

N

0 0.009km

APT O&M Services Pty Ltd
112 358 586

330 Grange Road
Kidman Park SA 5025
PO Box 171
Findon SA 5023
P: 61 8 8159 1661
F: 61 8 8353 5287
www.apa.com.au

STRICTLY CONFIDENTIAL

Jenna Grosser

186 Greenhill Rd

Parkside SA 5063

By email: jenna.grosser@kbr.com

Dear Jenna,

SUPPLY AND INSTALLATION OF NATURAL GAS INFRASTRUCTURE

Thank you for your recent enquiry regarding the reticulation of natural gas to Kilkenny Rd/David Tce and adjacent Kilkenny Railway Station, Kilkenny("**Enquiry**").

We understand that your Enquiry relates to a development by Jensen PLUS("**the Developer**") of approximately 509 dwellings and some commercial properties. ("**the Development**").

APT O&M Services Pty Ltd ("**APA**") is responsible for the operation and maintenance of the South Australian natural gas distribution network owned by Australian Gas Networks ("**AGN**").

This letter sets out APA's response to your Enquiry and its preliminary assessment on the availability of natural gas supply for the Development and the costs to supply and install natural gas infrastructure for the Development, based on the information provided in your Enquiry and information currently available to APA ("**Preliminary Assessment**").

Preliminary Assessment

1. Supply and installation of natural gas infrastructure for the Development is available in concept; and
2. Any possible headwork can only be confirmed when concept plan is submitted.

This Preliminary Assessment was undertaken using the following assumptions and considerations:

a. The "Natural Gas Infrastructure" comprises pipes and associated fittings, for:
   i. A natural gas main to the boundary of the Development site; and
   ii. Natural gas mains to reticulate gas within the Development site.

b. Natural gas reticulation into the Development will commence from Aroona North Rd, West Croydon (connect to 200SP);

c. It is assumed the Development's stages will commence at the entrance nearest to Aroona North, West Croydon.

d. The Developer will provide APA with access to a common trench for the installation of the natural gas infrastructure, with the common trench to follow the route shown on the plans submitted to APA.

e. The common trench (outlined in c above) will comply with all of APA's common trench requirements which include natural gas mains and are in APA's reasonable opinion suitable for the installation of the natural gas infrastructure. Further, the Developer will be responsible for providing bedding sand, back-fill and compaction unless otherwise agreed by APA.

APA Group comprises two registered investment schemes, Australian Pipeline Trust (ARSN 091 678 778) and APT Investment Trust (ARSN 115 585 441), the securities in which are stapled together. Australian Pipeline Limited (ACN 091 344 704) is the responsible entity of those trusts. The registered office is HSBC building, Level 19, 580 George Street, Sydney NSW 2000.

f. The overall layout of the aerial image for the Development as provided to APA resembles the final development plan.

g. If major changes are to occur throughout the concept stage including, but not limited to staging, the number of allotments, roadway access to the Development or any other major change which may deviate from the final development plan, this Preliminary Assessment will need to be revised by APA.

h. The availability of supply and costs to supply and install natural gas infrastructure for the Development are indicative, non-binding assessments only and may be subject to change at any time by APA.

i. APA may apply further terms and conditions on the supply and installation of natural gas infrastructure for the Development following receipt of a formal application for reticulation from the Developer.

Next Steps

When available please forward any future detailed staging plans to the email address below for Final Assessment by APA.

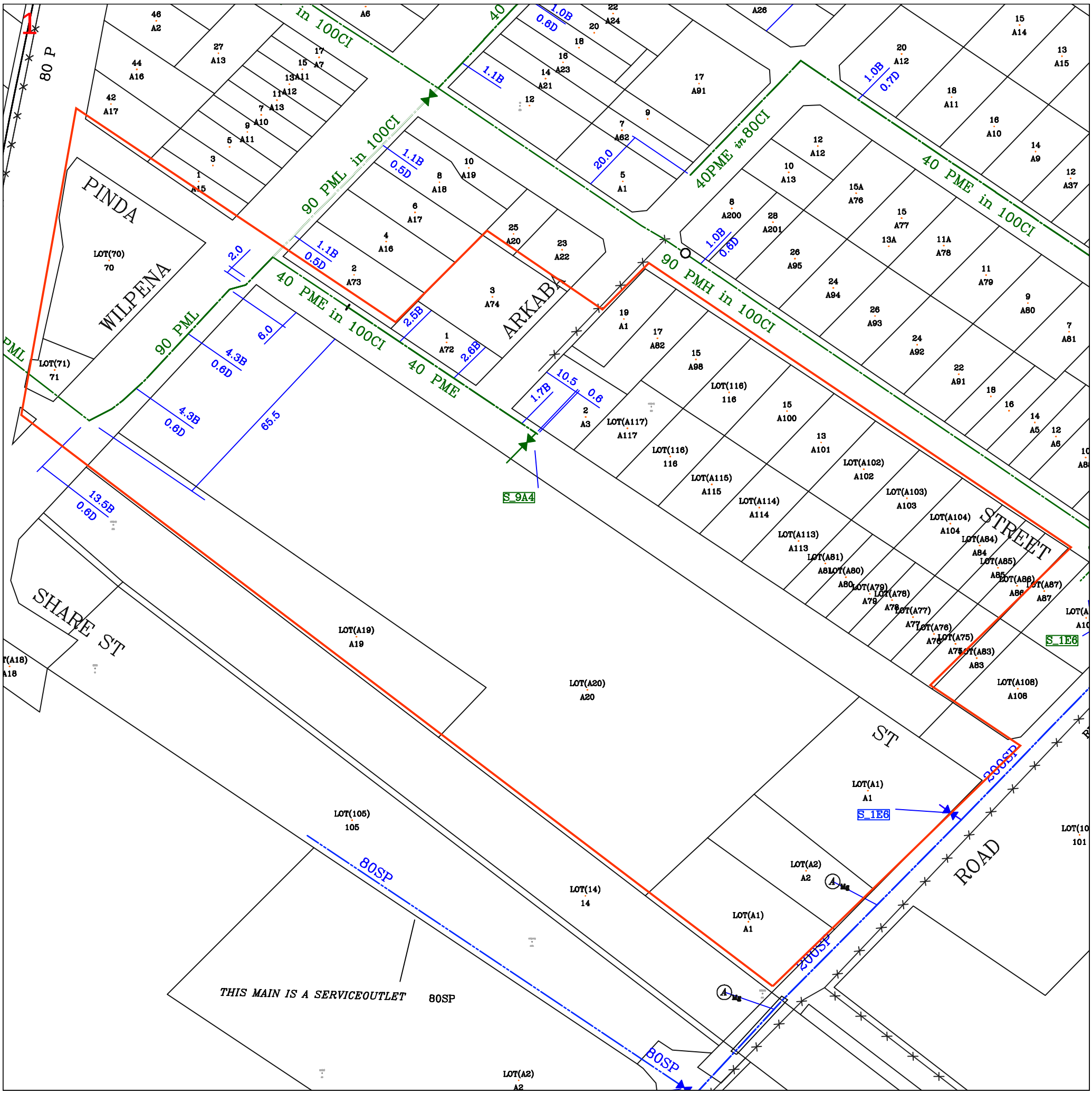
Yours sincerely,

Zofia Kramer

New Estate Coordinator
APA Group – Operator for Australian Gas Networks
330 Grange Road, Kidman Park SA 5025
PO Box 171, Findon SA 5023
newestates@apa.com.au

Site Address	David Terrace Adelaide 5009	**Sequence No**	78463335
Email	jenna.grosser@kbr.com	**Map Reference**	UbdAde 105B10,105B9,105C10,105C9

Before you commence any works you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA asap



ITEM	SYMBOL	TERMS	ITEM	SYMBOL
LOW PRESSURE 1.2 - 1.7kPa		B = BOUNDARY	DIAL BEFORE YOU DIG REQUESTED AREA	
MEDIUM PRESSURE 35 - 100kPa		D = DEPTH	PRIORITY MAIN COVERAGE	
HIGH PRESSURE 70 - 350kPa		Bok = BACK OF KERB		
TRANSMISSION PRESSURE 900 - 15000kPa		Fok = FRONT OF KERB		
PROPOSED MAIN (COLOUR BY PRESSURE)				
ABANDONED MAIN				

Map Key

1

Scale 1:1000

0 0.01km

NORTH

Jenna Grosser

Subject: FW: Kilkenny Mixed Use DPA - NBN

From: Jodie Lunn [mailto:jodielunn@nbnco.com.au]
Sent: Friday, February 8, 2019 10:51 AM
To: Jenna Grosser <Jenna.Grosser@kbr.com>
Subject: [External] RE: Kilkenny Mixed Use DPA - NBN

Hi Jenna,

I'm so sorry for the delay with this feasibility.

There would be no backhaul charges for **nbn** to service this development via Fibre to the Premises only our per premises contribution ($600/SDU or $400 per MDU would apply)

Please let me know if you would like me to put a formal proposal together for the developer

Cheers

Jodie

Jodie Lunn
Business Development Manager WA/SA/NT
nbn Build Partnerships | Demand Programs | NPD
M +61 412 050 773 | **E** jodielunn@nbnco.com.au

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PLEASE CONSIDER OUR ENVIRONMENT BEFORE PRINTING

From: Jenna Grosser <Jenna.Grosser@kbr.com>
Sent: Friday, 1 February 2019 2:48 PM
To: Jodie Lunn <jodielunn@nbnco.com.au>
Subject: RE: Kilkenny Mixed Use DPA - NBN

Hi Jodie,

I just wanted to touch base to see if you have any further advice regarding backhaul charges for Kilkenny?

Thanks and regards,

Jenna Grosser

KBR

Civil Engineer
Infrastructure Services Australia
186 Greenhill Road | Parkside, SA 5063 I Australia
Office: +61 8 8301 1274 | jenna.grosser@kbr.com

Follow KBR on Social Media:

From: Jodie Lunn [mailto:jodielunn@nbnco.com.au]
Sent: Friday, January 11, 2019 4:44 PM
To: Jenna Grosser <Jenna.Grosser@kbr.com>
Subject: [External] RE: Kilkenny Mixed Use DPA - NBN

Hi Jenna,

Apologies I didn't get to your email last year.

We can definitely service the proposed new dwellings with Fibre to the Premises under our new development program.

I've just initiated a planning assessment with our national planning team to determine if there would be any backhaul charges to bring fibre to the development.

I'll come back to you with the results.

Cheers

Jodie

Jodie Lunn
Business Development Manager WA/SA/NT
nbn Build Partnerships | Demand Programs | NPD
M +61 412 050 773 | **E** jodielunn@nbnco.com.au

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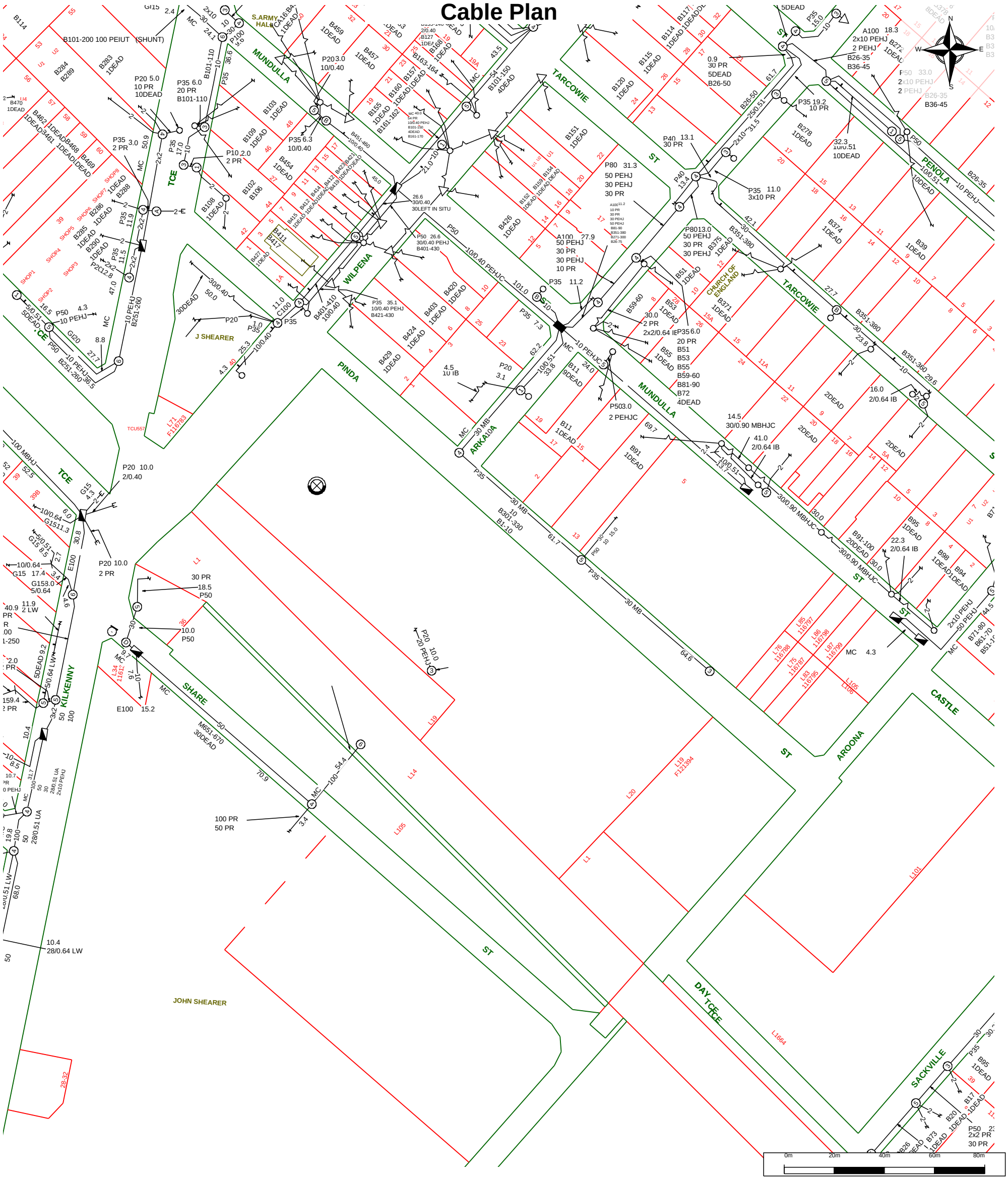
PLEASE CONSIDER OUR ENVIRONMENT BEFORE PRINTING

Cable Plan



Telstra	For all Telstra DBYD plan enquiries - email - Telstra.Plans@team.telstra.com For urgent onsite contact only - ph 1800 653 935 (bus hrs)
TELSTRA CORPORATION LIMITED A.C.N. 051 775 556	
Generated On 11/12/2018 17:21:28	

Sequence Number: 78463333

CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

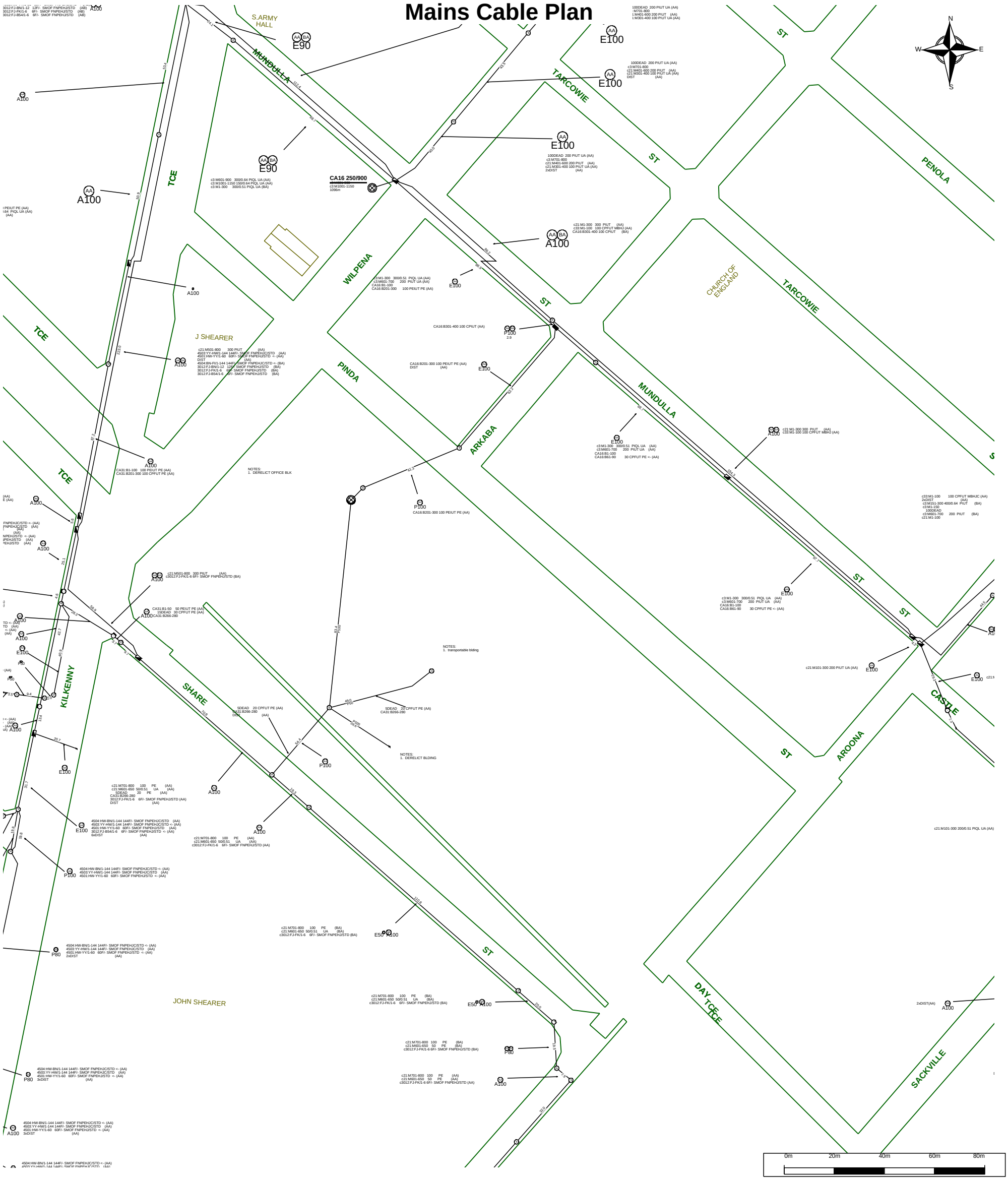
WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

Mains Cable Plan



For all Telstra DBYD plan enquiries -
email - Telstra.Plans@team.telstra.com
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TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

Generated On 11/12/2018 17:21:30

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Development Plan Amendment

By the Council

City of Chares Sturt

Kilkenny Mixed Use (Residential and Commercial) DPA (Privately Funded)

The Amendment

For Consultation

January 2020

Amendment Instructions Table

Name of Local Government Area:
City of Charles Sturt

Name of Development Plan
Charles Sturt Council

Name of DPA:
Kilkenny Mixed Use (Residential and Commercial) DPA

The following amendment instructions (at the time of drafting) relate to the Council Development Plan consolidated on 13 June 2019.

Where amendments to this Development Plan have been authorised after the aforementioned consolidation date, consequential changes to the following amendment instructions will be made as necessary to give effect to this amendment.

Amendment Instruction Number	Method of Change • Amend • Replace • Delete • Insert	Detail what in the Development Plan is to be amended, replaced, deleted or inserted. If applicable, detail what material is to be inserted and where. Use attachments for large bodies of material.	Is Renumbering required (Y/N)	Subsequent Policy cross-references requiring update (Y/N) if yes please specify.
COUNCIL WIDE / GENERAL SECTION PROVISIONS (including figures and illustrations contained in the text)				
Amendments required (Yes/No): No				
ZONE AND/OR POLICY AREA AND/OR PRECINCT PROVISIONS (including figures and illustrations contained in the text)				
Amendments required (Yes/No): **Yes**				
Suburban Activity Node Zone				
1.	REPLACE	Entire zone with the content of Attachment A	N	N
TABLES				
Amendments required (Yes/No): **No**				
MAPPING (Structure Plans, Overlays, Enlargements, Zone Maps, Policy Area & Precinct Maps)				
Amendments required (Yes/No): **Yes**				
Map Reference Table				
2.	INSERT	Against Suburban Activity Node listing – Maps ChSt/9 and ChSt/14	N	N
3.	INSERT	Against Affordable Housing listing – Map ChSt/14	N	N
4.	INSERT	Against Noise and Air Emissions listing – Map ChSt/14	N	N
Map(s)				
5.	REPLACE	• Council Index Map • Overlay Map ChSt/9 Affordable Housing • Overlay Map ChSt/9 Development Constraints • Overlay Map ChSt/9 Noise and Air Emissions • Overlay Map ChSt/9 Zone Map • Overlay Map ChSt/14 Development Constraints • Overlay Map ChSt/14 Zone Map with the Contents of Attachment B	N	N
6.	INSERT	The contents of Attachment C: • Overlay Map ChSt/14 Affordable Housing • Overlay Map CgSt/14 Noise and Air Emissions	N	N

Attachment A

Suburban Activity Node Zone

Black text = Core SA Planning Policy Library – Existing
Green text = Local Addition policy – Existing
~~Strike through text~~ = Text proposed to be deleted by this DPA
Red text = Local additional policy proposed as part of this DPA

Suburban Activity Node Zone

Refer to the *Map Reference Tables* for a list of the maps that relate to this zone.

OBJECTIVES

1 A zone that includes a range of medium and high density residential development supported by a mix of compatible land uses.

2 Well designed and functional mixed use areas with a walkable urban form, pedestrian and cyclist friendly streetscapes, and active street frontages that facilitate personal interaction and promote public transport use.

3 The design and layout of development to encourage walking and cycling and promote public transport use.

4 A mixed use area with a variety and concentration of activity close to a key focal point such as a fixed transit stop, activity centre or high quality open space.

5 Development that contributes to the desired character of the zone.

DESIRED CHARACTER

This zone will be developed as a medium to high density residential node with integrated mixed use development and quality public open spaces around public transit stops. This node is set within a wider suburban context and offers a focus for community scale activity. It is designed to foster an area with a sense of identity and uniqueness.

Residential development, primarily in the form of row dwellings and residential flat buildings, is appropriate in the zone. Aged and student accommodation, serviced apartments and diverse housing forms that cater for a range of household types, ages and life cycle stages, which are adaptable, are also encouraged in the zone to take advantage of its proximity to nearby transport services and facilities.

To minimise the impacts on development in adjacent zones, the zone will consist of a Core Area and Transition Area. At Seaton, these areas are identified on *Concept Plan Maps ChSt/30 – Suburban Activity Node Zone Seaton.* At Kilkenny, the Transition Area consists of those properties fronting Mundulla Street and Arkaba Road to a depth of 30 metres, and the Core Area applies to the remainder of the land.

The form, scale and mix of development will be at its greatest intensity in the Core Area. At Seaton, building heights of up to 4 storeys (16.5 metres) maybe appropriate within the Core Area where located more centrally around the existing railway station. At Kilkenny, building heights of up to 5 storeys (21 metres) are appropriate in the Core Area, reducing to 2 – 3 storeys (8.5 metres – 12.5 metres) in the Transition Area.

Land uses located at street level will include a mix of residential, shop, office and tourist accommodation. Office uses may be appropriate on upper floors especially where they provide a buffer between more active ground floor and residential activity. The mix of uses will cater for the day to day needs of local residents and workers and will be at its greatest intensity closest to the public transit. Features and activities that attract people and add vitality to the street, such as display windows, retail shopfronts and outdoor dining areas are desirable, particularly at ground level adjacent to Trimmer Parade and Tapleys Hill Road at Seaton and David Terrace and Wilpena Terrace at Kilkenny.

The Transition Area will act as a buffer between the Core Area and nearby lower density residential zones or lower intensity zones. Land uses in the Transition Area will be predominantly residential but at Seaton may include other low impact uses such as offices and retail which address the frontage along Trimmer Parade. The density and intensity of development will be less than that of the Core Area but will be greater than neighbouring residential zones. At Seaton, building heights of up to 3 storeys (12.5 metres) maybe appropriate within the Transition Area where located closest to Trimmer Parade to maximise its location to the railway station.

Trimmer Parade at Seaton and all existing and new streets at Kilkenny will develop as a pedestrian friendly environment achieved by landscaping, surface treatments, street furniture and building design. Building setbacks along Trimmer Parade and the eastern side of Talpeys Hill Road at Seaton and the eastern side of David Terrace at Kilkenny are subject to road widening requirements and will also consider additional setback requirements to encourage street activation (eg outdoor dining) due to the narrow nature of the existing footpath. Building setbacks adjacent to the railway corridor will take into account the potential electrification of the railway line to address safety distance requirements, as well as the establishment of the Outer Harbour Greenway at Kilkenny.

Development is within defined building envelopes that manage the location and scale of buildings to achieve high quality urban design. The building envelopes will contribute to the provision of a coherent public realm by framing the street space and, in particular, the physical and functional character of the road and transit stop. Buildings at the interface of the zone with lower intensity zones will create an appropriate transition of development scale and massing.

The range of setbacks provided in the zone will be critical in providing space between buildings and in front yards for landscaping to soften the hard edge of new built form.

As development intensifies, some overlooking, overshadowing and noise impacts may occur within the zone but this will be moderated through good design and noise attenuation techniques. Solar access may also be reduced. Any adverse impacts for adjoining zones will be minimised through appropriate building envelopes, transition of building heights, design and siting of windows and balconies, and use of landscaping. Buildings will also be designed to maximise solar access.

There are a number of potential sources of air and/or noise emissions within and adjacent to the zone including Tapleys Hill Road, Trimmer Parade, the Grange railway line and a hotel at Seaton, as well as the Outer Harbor railway line, David Terrace, and the O-I Glass plant and warehouse at Kilkenny. Development should be sited, ~~and~~ designed and constructed to mitigate these potential impacts.

To promote a compact pedestrian oriented development, building entrances will be oriented to the street, large parking areas will be minimised and on-site parking areas will be located behind buildings.

The function of Tapleys Hill Road, ~~and~~ Trimmer Parade and David Terrace as arterial roads will be protected by minimising access points. Access will be provided from secondary road frontages, rear access ways and serviced by internal roads where possible with provision for on-street car parking, with vehicle access points at Seaton limited to those identified on *Concept Plan Maps ChSt/30 – Suburban Activity Node Zone Seaton.*

Amalgamation of adjacent allotments or sharing of facilities including communal open space, parking areas and access ways is encouraged.

A high amenity public realm and pedestrian environment will be achieved by landscaping, surface treatments, street furniture and building design. Footpaths will be wide and street trees will shade the footpath and soften the built form. Colonnades, courtyards, awnings and street furniture will create a pedestrian friendly environment. Side and internal streets will incorporate traffic calming and Water Sensitive Urban Design measures.

The street system will be highly connected to surrounding areas and within the zone to maximise walkability and reduce local travel distances. Cycle paths and routes will be provided which are safe, accessible, well signed and connect and link key local destinations (such as ~~the~~ train stations, shops, schools and local parks).

In Seaton, a local park will be provided for the purposes of community interaction and for local amenity. The location of public open space is desired to the north of Trimmer Parade with connections to the existing street/footpath network and adjacent to the proposed 'Greenway' along the railway corridor to provide surveillance and interaction with the existing suburb. The desired location of public open space is identified on *Concept Plan Map ChSt/30 – Suburban Activity Node Zone Seaton*.

Front fences will be minimised to ensure visual permeability and avoid large blank walls to encourage passive surveillance, active streetscapes and a visually interesting public realm.

At Kilkenny, a small portion of the zone is within the Historic Conservation Area, as identified within *Overlay Maps – Heritage*. Development within and directly abutting this part of the zone will have regard to the

elements of historic character through the consideration of height, siting, design, use of materials and fencing of new buildings.

There are areas within the zone known to be affected by potentially contaminating activities. Offsite contamination may also exist on adjacent or nearby land, which may impact the use of the land within the zone. The extent of contamination in some areas is unknown. Development of these areas affected will not proceed unless appropriate investigations and remediation (where required) has been undertaken. This may include in some risk situations, either a Preliminary Site Investigation (PSI), detailed Site Investigation (DSI) or a Site Contamination Audit Report (SCAR) being prepared.

Water Sensitive Urban Design systems, including the harvest, treatment, storage and reuse of storm water, will be integrated throughout the area at the neighbourhood, site and building level. Harvested storm water will improve the aesthetic and functional value of open spaces, including public access ways and greenways. ~~Front fences will be designed to ensure visual permeability and avoid large blank walls to encourage passive surveillance, active streetscapes and a visually interesting public realm. (other than a bulky goods outlet)~~

PRINCIPLES OF DEVELOPMENT CONTROL

Land Use

1 The following types of development, or combination thereof, are envisaged in the zone:

- affordable housing
- aged persons accommodation
- community centre
- consulting room
- dwelling
- educational establishment
- nursing home
- office
- pre-school
- primary school
- residential flat building
- retirement village
- shop or group of shops, excluding a bulky goods outlet or a retail showroom
- supported accommodation
- tourist accommodation.

2 Non-residential land uses should have a local or neighbourhood focus to their scale of activity and intended market catchment.

3 Development listed as non-complying is generally inappropriate.

4 At Seaton, Core Areas, Transition Areas and other identified features should be developed in accordance with the relevant *Concept Plan Map ChSt/30 – Suburban Activity Node Zone Seaton*.

5 Development within walking distance of public transport stops should comprise land uses that directly promote public transport use and provide opportunities for multi-purpose trips.

6 Development should primarily take the form of:

(a) in Core Areas - residential flat buildings, non-residential buildings and buildings comprising two or more land uses with non-residential land uses on the ground floor

(b) in Transition Areas - residential flat buildings, row dwellings, detached and semi-detached dwellings with supporting shops and community facilities.

7 At Kilkenny, development fronting Mundalla Street should only comprise residential development.

8 Except in Core Areas where a higher intensity of development is envisaged, non-residential development should:

(a) have a local or neighbourhood focus to their scale of activity and intended market catchment

(b) encourage walking to local shopping, community services and other activities

(c) not detrimentally impact on the amenity of nearby residents.

9 Transition Areas should be developed to provide a transition between an intense core of development and neighbouring lower intensity development.

10 Shops or groups of shops (other than a bulky goods outlet) and offices should have the following maximum gross leasable areas:

Designated area	Maximum gross leasable areas (square metres)
Core Area	1000
Transition Area	1000 at Seaton 250 at Kilkenny

11 Within the Core Area, direct vehicle access from Trimmer Parade, ~~and~~ Tapleys Hill Road and David Terrace should be minimised and provided from secondary road frontages, rear access ways and internal roads, with vehicle access points at Seaton limited, unless ~~those~~ identified on *Concept Plan Map ChSt/30 – Suburban Activity Node Zone Seaton*.

12 Development incorporating internal roads should be designed to provide on-street car parking.

Form and Character

13 Development should be consistent with the desired character for the zone.

14 Development should graduate from medium-rise in Core Areas to low-rise in Transition Areas, especially where the development site abuts the zone boundary.

15 Garage top apartments that share the allotment and services of the main dwelling should:

(a) be no more than 2 storeys in height above the garage (a total of 3 storeys)

(b) front a street that provides rear access for vehicles

(c) complement the existing dwelling or mixed use building.

16 In Core Areas:

(a) the ground and first floor of buildings of 4 or more storeys should be built to dimensions (including a minimum ceiling height of 4.5 metres) to allow for adaptation to a range of land uses, including retail, office and residential, without the need for significant change to the building.

(b) a minimum of 50 per cent of the ground floor primary frontage of ~~commercial~~ non-residential buildings ~~facing Tapleys Hill Road or Trimmer Parade~~ should be visually permeable, transparent or clear glazed facing:

(i) Tapleys Hill Road or Trimmer Parade at Seaton

(ii) David Terrace and Wilpena Terrace at Kilkenny.

17 Residential development (other than residential development in mixed use buildings), should achieve a minimum net residential site density in accordance with the following:

Designated area	Minimum net residential site density
Core Area	70 dwellings per hectare net
Transition Area	35 dwellings per hectare net

18 Sensitive development, within the evaluation distance of an active *Environment Protection Act 1993* licenced activity should seek to mitigate impacts of noise and air quality, including odour from the licenced activity, through built form, landscaping, design and orientation.

Building Envelopes

Building Height

19 Except where airport building height restrictions prevail, building heights (excluding any rooftop located mechanical plant or equipment) should be consistent with the following parameters:

Designated area	Minimum building height	Maximum building height
Core Area	3 storeys (12.5 metres)	4 storeys (16.5 metres) at Seaton 5 storeys (21 metres) at Kilkenny
Transition Area	2 storeys (8.5 metres)	2 storey (8.5 metres) within 9.5 metres of the Mundulla Street frontage at Kilkenny 3 storeys ~~and~~ (12.5 metres) elsewhere
Historic Conservation Area	-	1 storey within 7 metres of the primary street frontage 2 storeys (8.5 metres) within 9.5 metres of the primary street frontage 3 storeys (12.5 metres) elsewhere

Setbacks from the Primary Road Frontage

20 Buildings (excluding verandas, porticos and the like) should be set back from the primary road frontage in accordance with the following parameters:

Designated area	Minimum setback from the primary road frontage (metres)
Core Area and Transition Area	No minimum along Tapleys Hill Road, Trimmer Parade, David Terrace or Wilpena Terrace ~~No minimum along Trimmer Parade~~ 3 metres elsewhere

Note: These setbacks are in addition to any setback requirements pursuant to the Metropolitan Adelaide Road Widening Plan.

Setbacks from Side Boundaries

21 Other than where located within, or in a location sharing a common boundary with, the Historic Conservation Area, buildings (excluding verandas, porticos and the like) should be set back from side boundaries in accordance with the following parameters:

Designated area	Minimum setback from side boundaries (where not on a street or different zone boundary)	Minimum setback from side boundaries on a zone boundary
Core Area and Transition Area	Irrespective of height, no minimum on the boundary within 18 metres from the front property boundary. No minimum for the remaining length for the ground level only. More than 18 metres from the front property boundary, 1st level and above (i.e. above ground level) should be setback 2 metres.	0.9 metres for single storey (3 metres in height) 2 metres for two storeys (8.5 metres in height) 3 metres for greater than two storeys

22 Within, or in a location sharing a common boundary with the Historic Conservation Area, buildings should be set back from side boundaries (other than where in the form of a common wall) in accordance with the following parameters:

(a) 1.5 metres from a secondary road frontage

(b) 1.5 metres for single storey (3 metres height)

(c) 2.5 metres for two storeys (8.5 metres in height)

(d) 5 metres for greater than two storeys.

23 Unless abutting an existing building, walls (including attached structures) that have a wall height of greater than 4.5 metres, located on or within 2 metres of side allotment boundaries should provide attractive and interesting facades utilising techniques and combinations such as the following:

(a) including recessed sections of wall

(b) continuing some façade detailing

(c) integrating use of different building materials and finishes

(d) including green landscaped walls / gardens

(e) including public art, including murals.

Other Setbacks

24 Buildings (excluding verandahs, porticos and the like) should be set back in accordance with the following parameters:

Setback parameter	Value (metres)
Minimum setback from secondary road frontage (other than within the Historic Conservation Area)	0.9
Minimum setback from a rear lane access way	No minimum where the access way is 6.5 metres or more OR Where the access way is less than 6.5 metres in width, the distance equal to the additional width required to make the access way 6.5 metres or

Setback parameter	Value (metres)
	more, to provide adequate manoeuvrability for vehicles
Minimum setback from the rear allotment boundary	5
Minimum setback from the rear boundary that is common with the boundary of the Historic Conservation Area for buildings in excess of 2 storeys	5 for buildings up to two storeys (6m wall height) 10 metres for buildings over 2 storeys

Design and Appearance

25 Buildings should address public open space and defined pedestrian and cycle routes as illustrated in *Concept Plan Map ChSt/30 – Suburban Activity Node Zone Seaton*.

26 At Kilkenny, development should facilitate the creation of a public plaza adjacent to the northern rail station platform, Wilpena Terrace and Wilpena Reserve.

27 Development at Kilkenny should be setback from the rail corridor to allow for the creation of the Outer Harbour Greenway.

28 Development at Kilkenny should be sited and designed to provide for pedestrian connections to:

(a) Arkaba Road from the southern end of the Kilkenny train station platform

(b) MJ McInerney Reserve.

29 Masonry fences should be no more than 1.2 metres in height to maintain sight lines between buildings and the street, and to improve safety through passive surveillance.

Land Division

30 Land division in the zone is appropriate provided new allotments are of a size and configuration to ensure the objectives of the zone can be achieved.

PROCEDURAL MATTERS

Complying Development

Complying developments are prescribed in Schedule 4 of the *Development Regulations 2008*.

In addition, other than land with frontage to Mundulla Street at Kilkenny, the following forms of development are designated as complying subject to the conditions contained in *Table ChSt/2A – Off-street Vehicle Parking Requirements for Designated Areas:*

(a) change in the use of land from residential to office on the ground or first floor of a building

(b) change in the use of land from residential to shop less than 250 square metres on the ground floor of a building.

Non-complying Development

Development (including building work, a change in the use of land or division of an allotment) involving any of the following is non-complying:

Form of development	Exceptions
Bulky goods outlet	
Hotel at Seaton	Except for alterations and additions to an existing hotel.
Industry	
Fuel depot	
Public service depot	
Road transport terminal	
Service trade premises	Except for alterations and additions to an existing service trade premises.
Store	
Transport depot	
Warehouse	
Waste reception storage treatment or disposal	

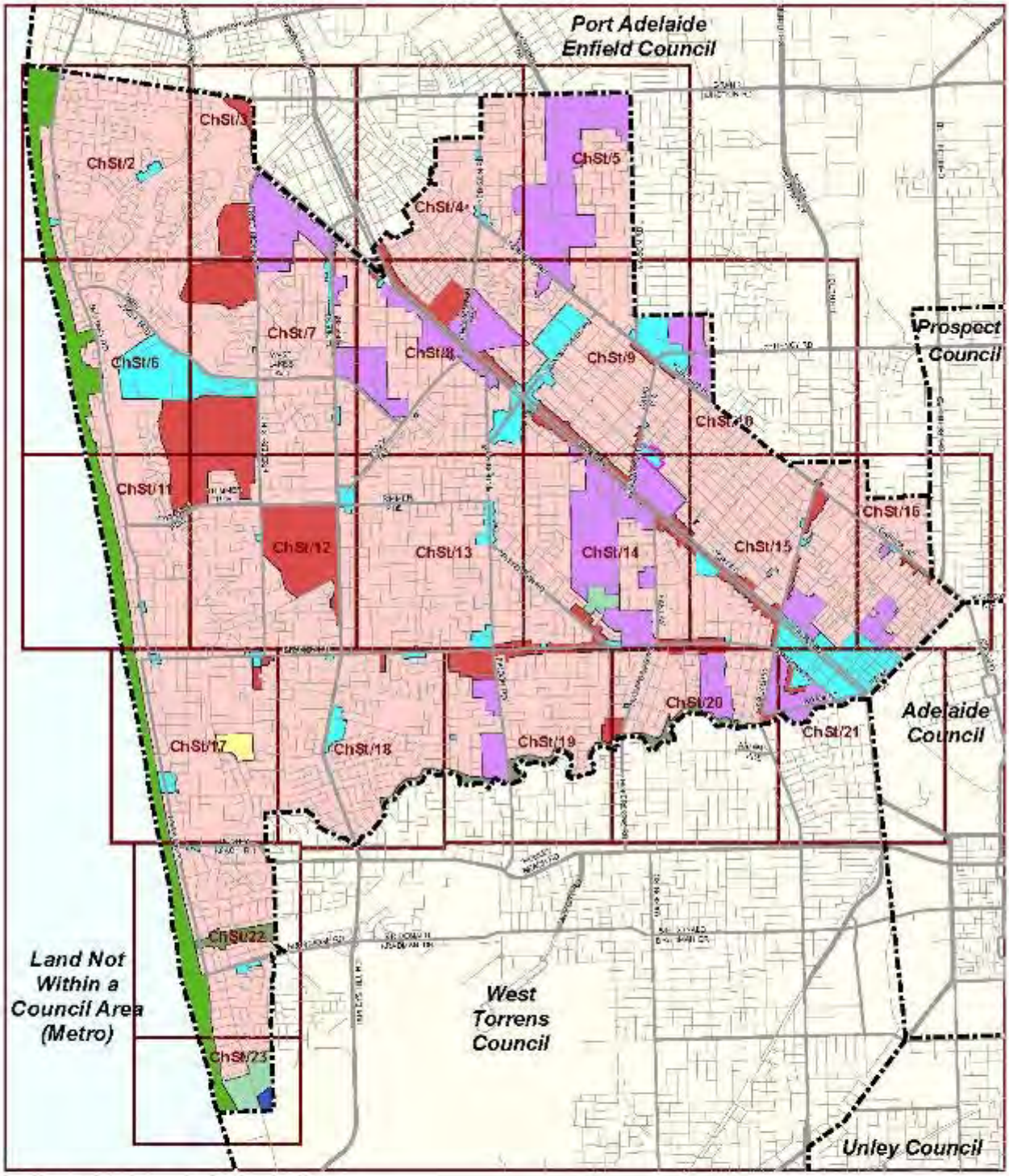
Public Notification

Categories of public notification are prescribed in Schedule 9 of the *Development Regulations 2008*.

In addition, the following forms of development, or any combination thereof (except where the development is non-complying), are designated:

Category 1	Category 2
Advertisement	All forms of development not listed as Category 1
Aged persons accommodation	
All forms of development that are ancillary and in association with residential development	
Community centre	
Consulting room	
Dwelling	
Dependent accommodation	
Educational establishment	
Hall	
Nursing home	
Office	
Pre-school	
Primary school	
Residential flat building	
Retirement village	
Shop or group of shops	
Supported accommodation	
Tourist accommodation	

Attachment B



For the purposes of the Development Plan, unless otherwise clearly indicated, the zone/policy area/precinct boundaries bounded on or intended to be defined by Maps ChSt/1 to Map ChSt/23 inclusive shall be read as conforming in all respects to the case may require, to the land division boundaries, to the centre line of roads or drainage reserves or to the site boundaries, or to mapping straight lines joining the positions defined by survey or by the measurements shown on the said maps against the same zone/policy area/precinct boundaries are shown on otherwise indicated.

N

0 5km

Council Index Map

CHARLES STURT COUNCIL
Version A - 8 June 2019

Airport Building Heights

4 - 14m	All Structures restricted to height identified on maps (above existing ground level, measured from the top of the nearest roadside curb)
Zone C	All Structures Exceeding 15 metres above existing ground level
Zone D	All Structures Exceeding 45 metres above existing ground level
Zone E	All Structures Exceeding 100 metres above existing ground level

N

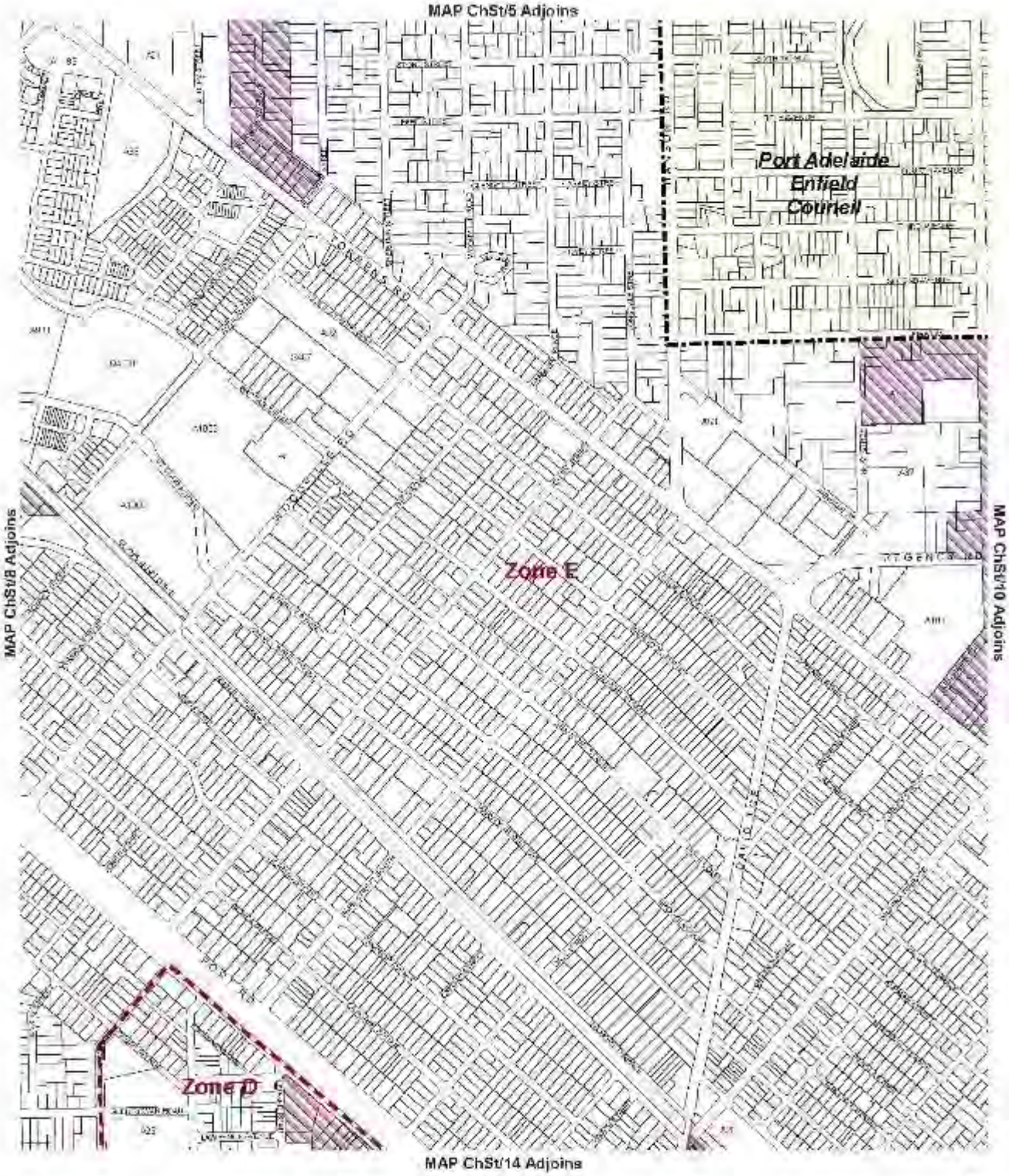
0 5 km

Overlay Map ChSt/1

DEVELOPMENT CONSTRAINTS

Airport Building Heights
Industry Interface Area
Development Plan Boundary

CHARLES STURT COUNCIL
Version A - 8 June 2019



Airport Building Heights
Zone D All Structures Exceeding 45 metres above existing ground level
Zone E All Structures Exceeding 100 metres above existing ground level

N

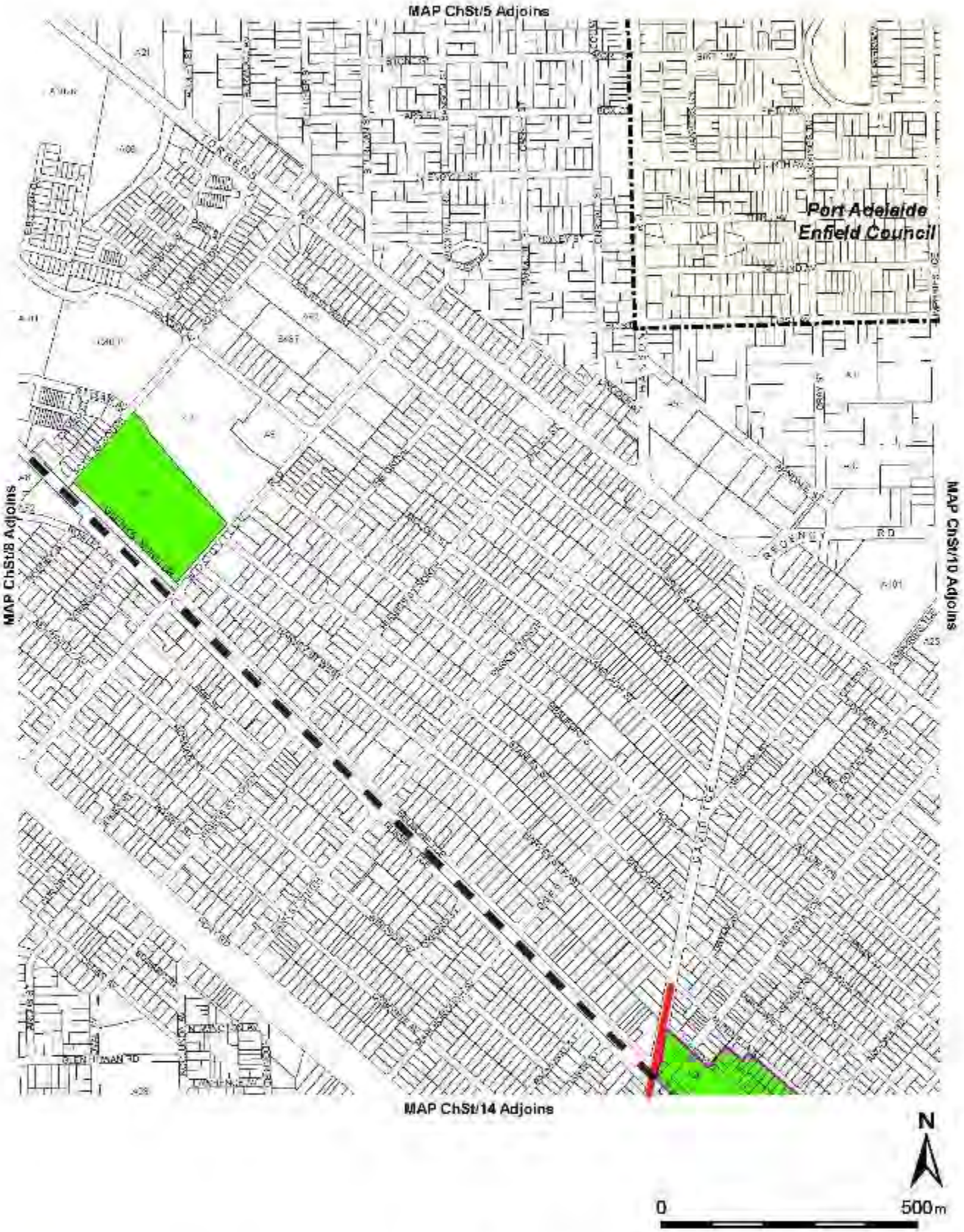
0 500 m

Overlay Map ChSt/9

DEVELOPMENT CONSTRAINTS

Airport Building Heights
Industry Interface Area
Development Plan Boundary

CHARLES STURT COUNCIL
Version A - 6 June 2019



Designated Road: type A road

Train Line

Noise and Air Emissions Designated Area

Development Plan Boundary

Overlay Map ChSt/9

NOISE AND AIR EMISSIONS

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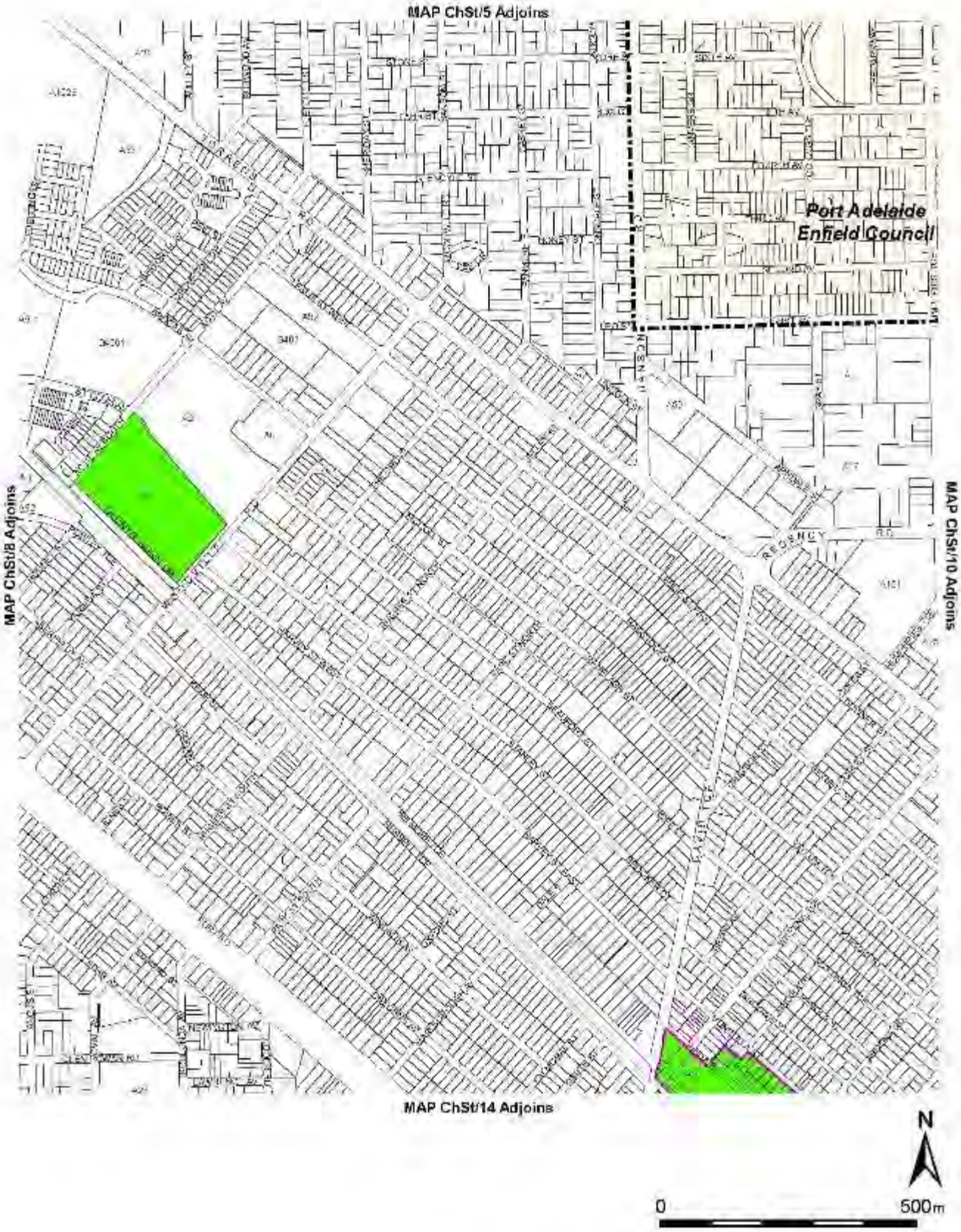

Overlay Map ChSt/9

AFFORDABLE HOUSING

Affordable Housing Designated Area

Development Plan Boundary

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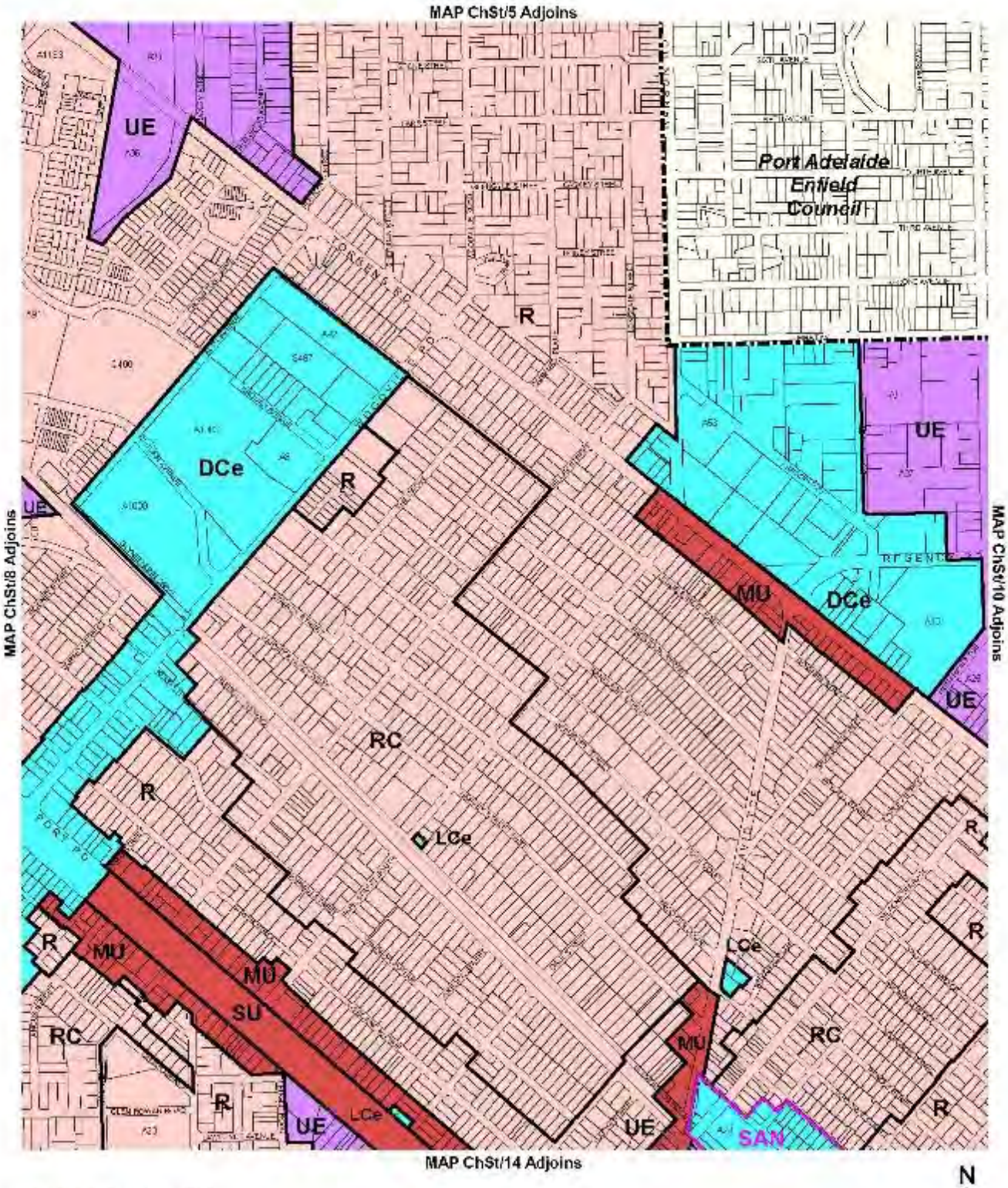

Zones

- SAN Suburban Activity Node
- DCe District Centre
- LCe Local Centre
- MU Mixed Use
- R Residential
- RC Residential Character
- SU Special Use
- UE Urban Employment
- Zone Boundary
- Development Plan Boundary

Zone Map ChSt/9

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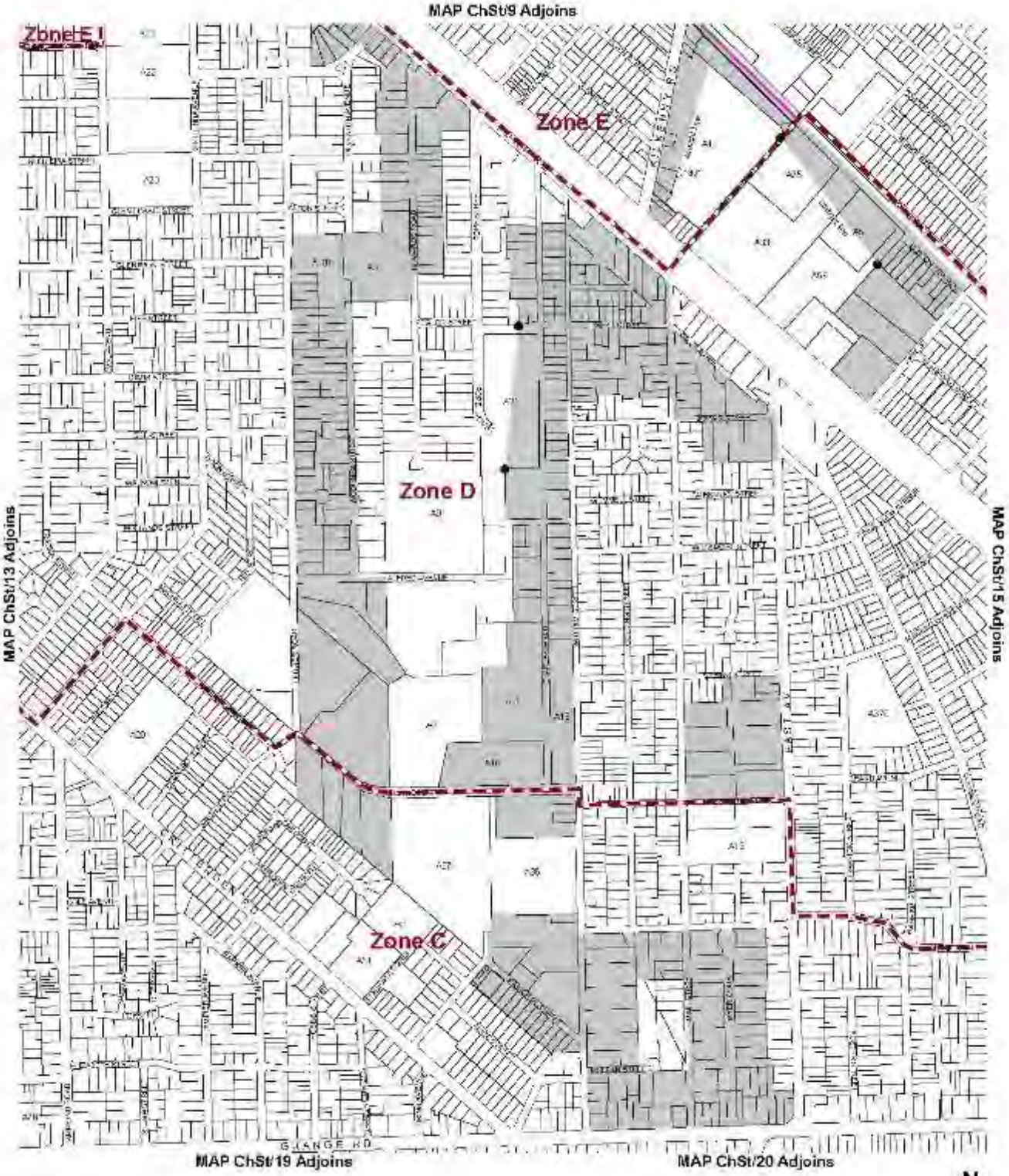


Airport Building Heights

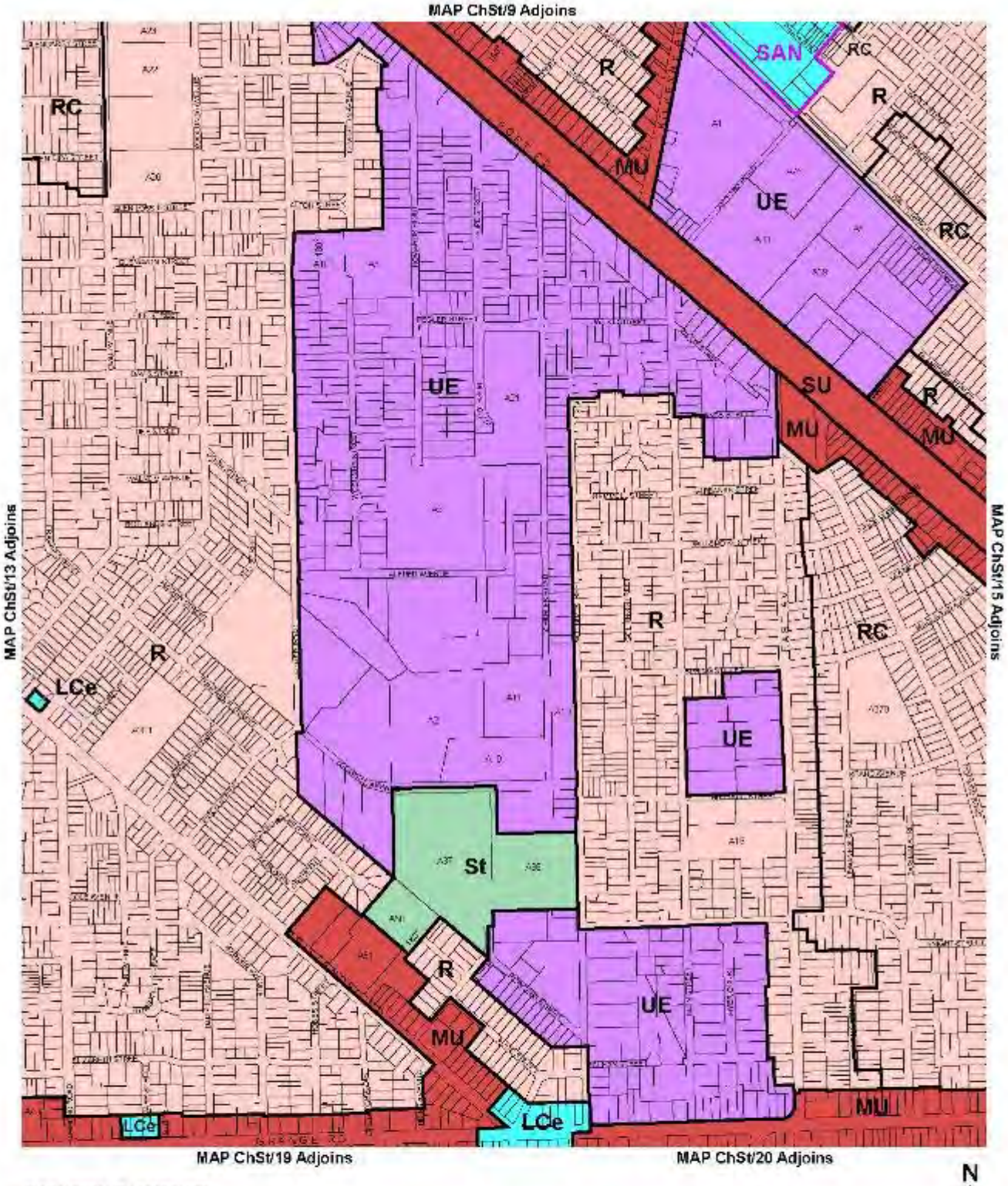
Zone C All Structures Exceeding 15 metres above existing ground level
Zone D All Structures Exceeding 45 metres above existing ground level
Zone E All Structures Exceeding 100 metres above existing ground level

Overlay Map ChSt/14

DEVELOPMENT CONSTRAINTS

Airport Building Heights
Industry Interface Area

CHARLES STURT COUNCIL
Version A - 8 June 2019



N

0 500 m

Zones

SAN	Suburban Activity Node
LCe	Local Centre
MU	Mixed Use
R	Residential
RC	Residential Character
SU	Special Use
St	Stadium
UE	Urban Employment
	Zone Boundary

Zone Map ChSt/14

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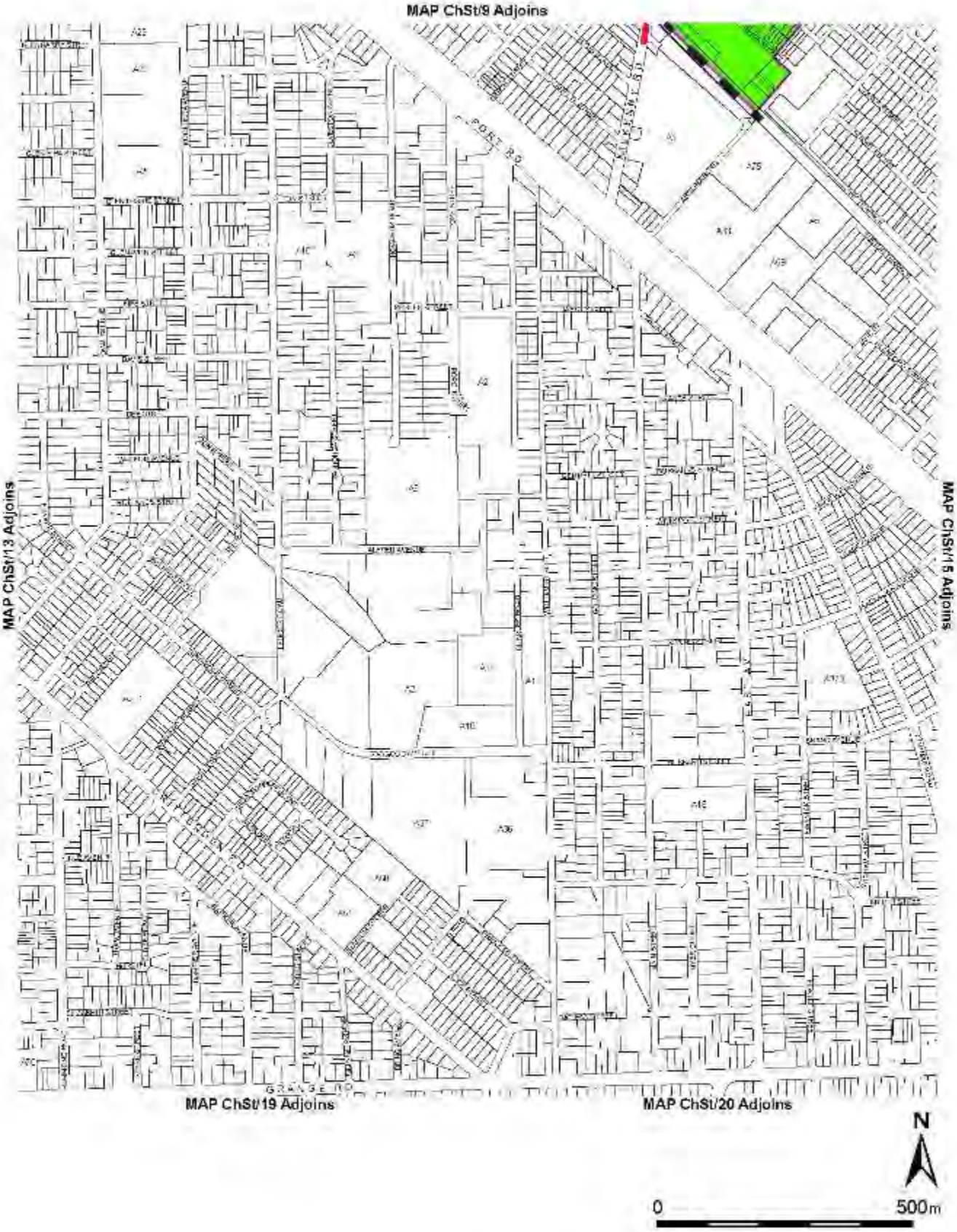
Attachment C



Designated Road: type A road

Train Line

Noise and Air Emissions Designated Area

Overlay Map ChSt/14

NOISE AND AIR EMISSIONS

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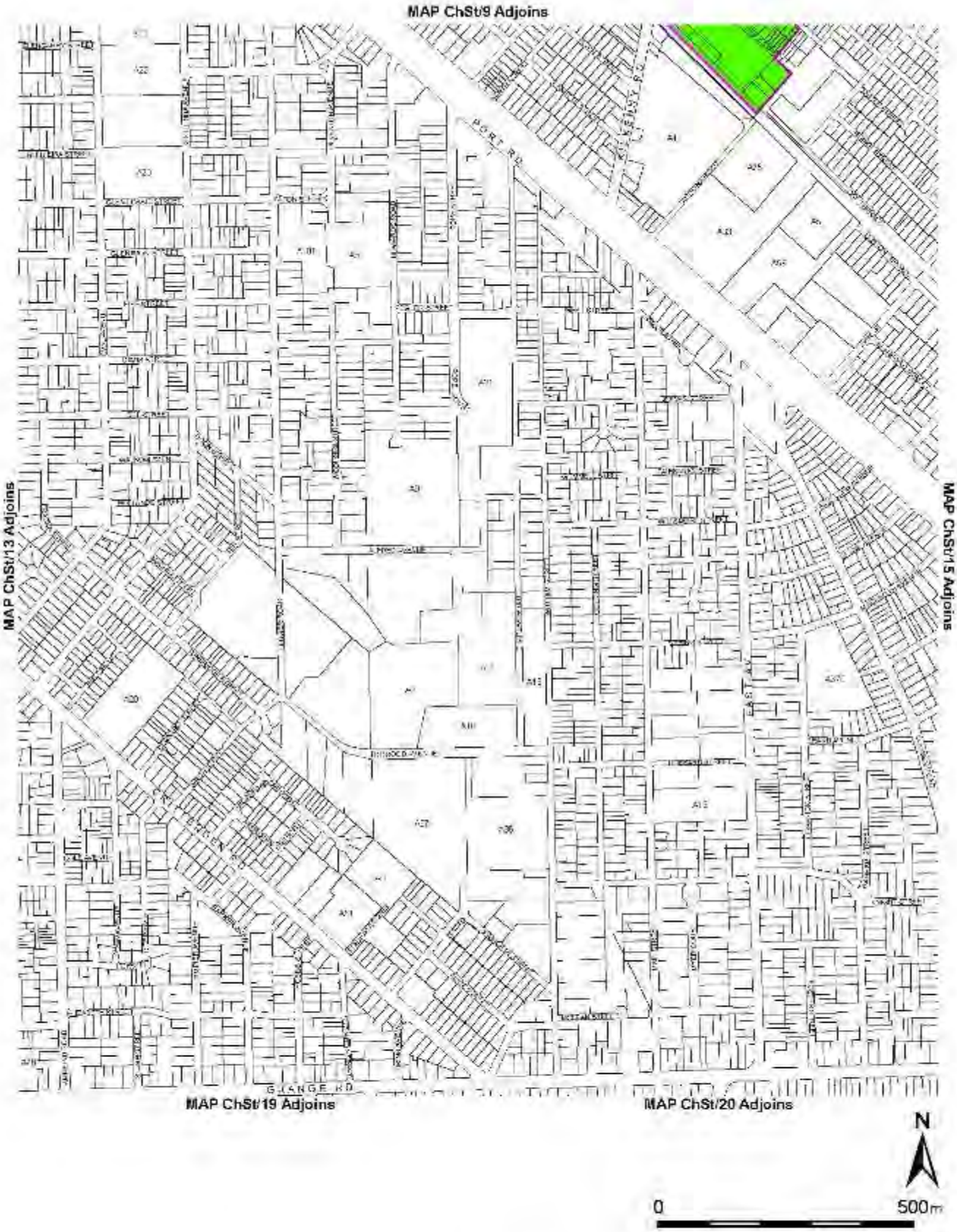

Overlay Map ChSt/14

AFFORDABLE HOUSING

Affordable Housing Designated Area

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