6.4

Moolap

1 - Investigation Area Context

1.1 Total area of land within investigation area

498.422 ha (gross land area).

1.2 Definition of investigation area:

The northern section of the Moolap investigation area is defined by the land parcels which are contiguous with urban residential areas to the west of Helm Street, as well as additional land parcels to the immediate west of these parcels (up to Coppards Road).

Limiting the investigation area to either only those lots that are strictly contiguous with the settlement boundary or to lots facing Coulter Street would require reliance on an alternative settlement boundary defined by the rear boundaries or lots. These features are not considered to represent a sufficiently logical or enduring settlement boundary. Additional land parcels up to Coulters Road have therefore been included within the investigation area, on the basis that Coppards Road is the closest feature of any significance that could potentially be used to define an alternative settlement boundary in this local area.

The southern section of the Moolap investigation area is defined by the following features:

- Moolap Station Road to the east
- Woods Road to the south-east
- Flood-prone land to the south-west*

[*Aside from the mapped extent of the flood-prone land, there is currently no natural or artificial feature that would represent an alternative logical or enduring boundary to Woods Road. The lots facing Woods Road are only partially affected by flooding constraints and these have therefore been included in the investigation area to allow consideration of the suitability of those parts of these land parcels that are not affected by flooding.]

The Moolap investigation area is shown at Figures 40 and 41 overleaf.

1.3 Current Zoning and Overlays:

The land within the investigation area is predominately zoned Low Density Residential (LDRZ) to the north and Farming Zone (FZ) to the south. An existing recreation service within the investigation area is zoned Public Park and Recreation (PPRZ).

The following overlay controls apply to land within the investigation area:

- Floodway Overlay (south-east and south-west parts of area)
- Land Subject to Inundation Overlay (south-east part of area)
- Special Building Overlay (central and north parts of area)
- Heritage Overlay (Residence on Earles Road Moolap)

Land immediately north and south of the investigation area is included within Environmental Significance Overlay (high value wetlands and habitat protection).

The above zones and overlays are shown at Figures 42 to 44.

A photo montage of the existing site context of the investigation area is shown at Figure 45.

Geelong Growth Investigation Areas

Moolap Investigation Area

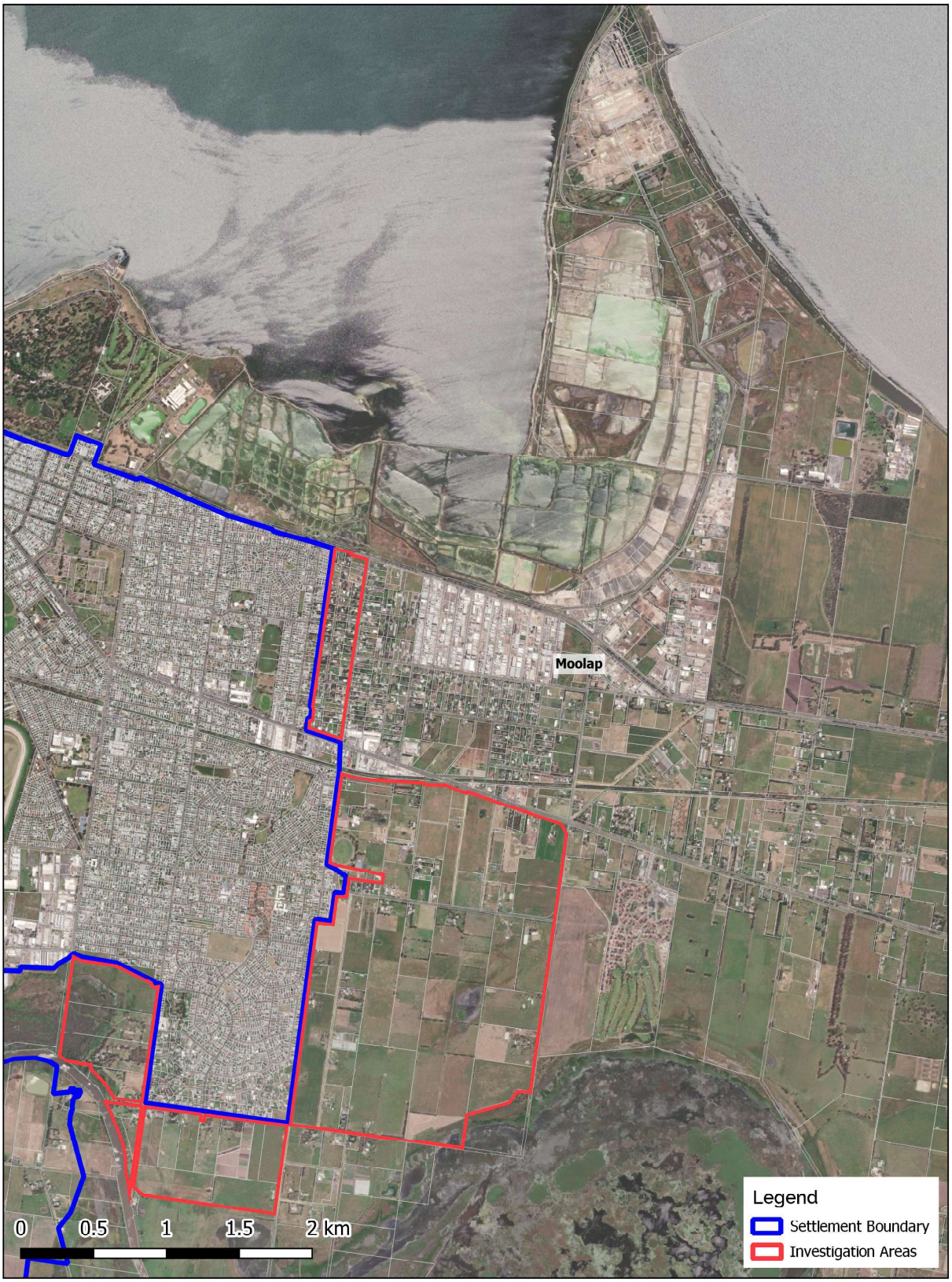


Figure 40. Moolap – Aerial Cadastral Plan.

Geelong Growth Investigation Areas

Moolap Investigation Area

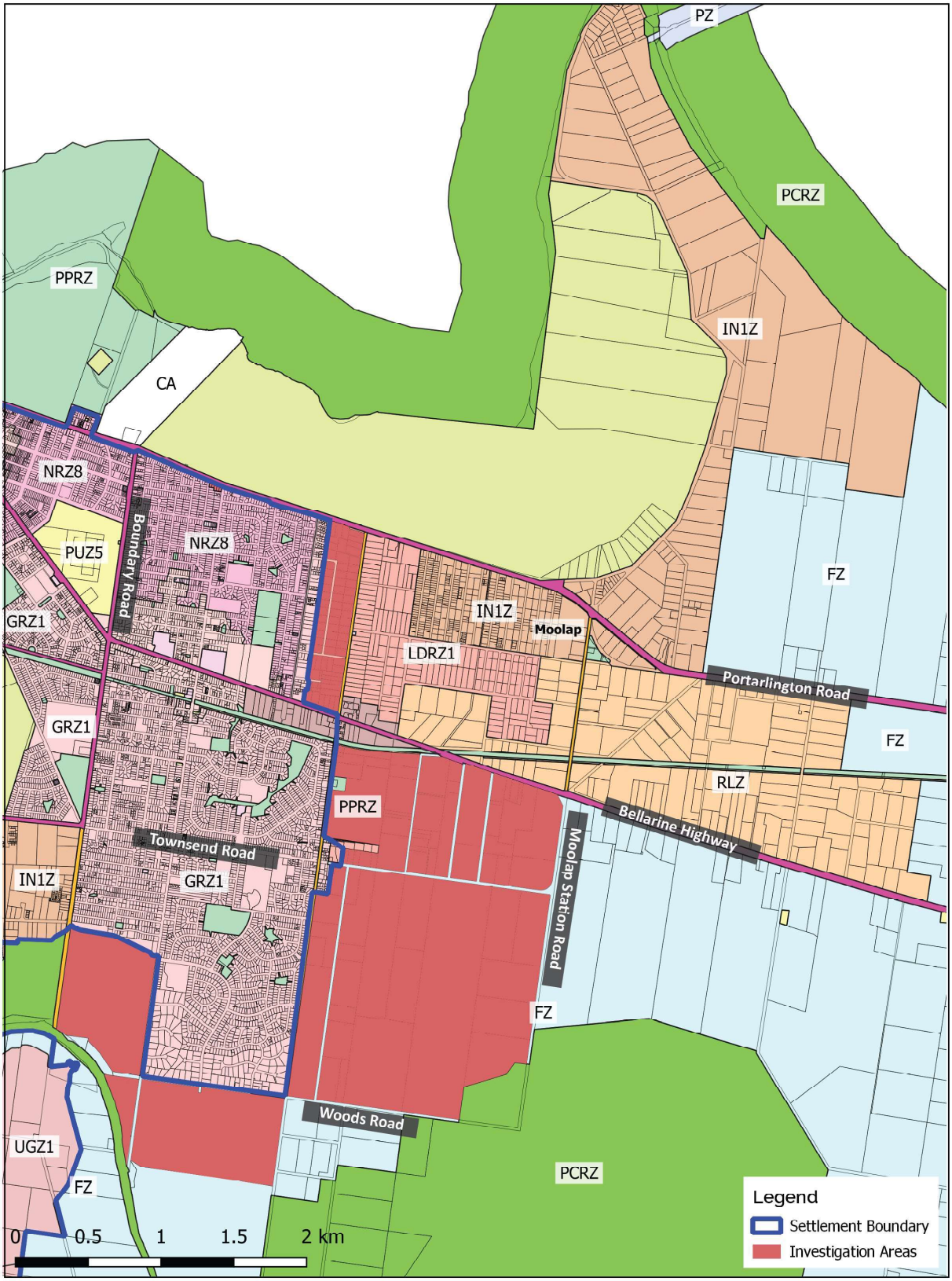


Figure 41. Moolap – Investigation Area Plan.

Geelong Growth Investigation Areas

Moolap - Zoning

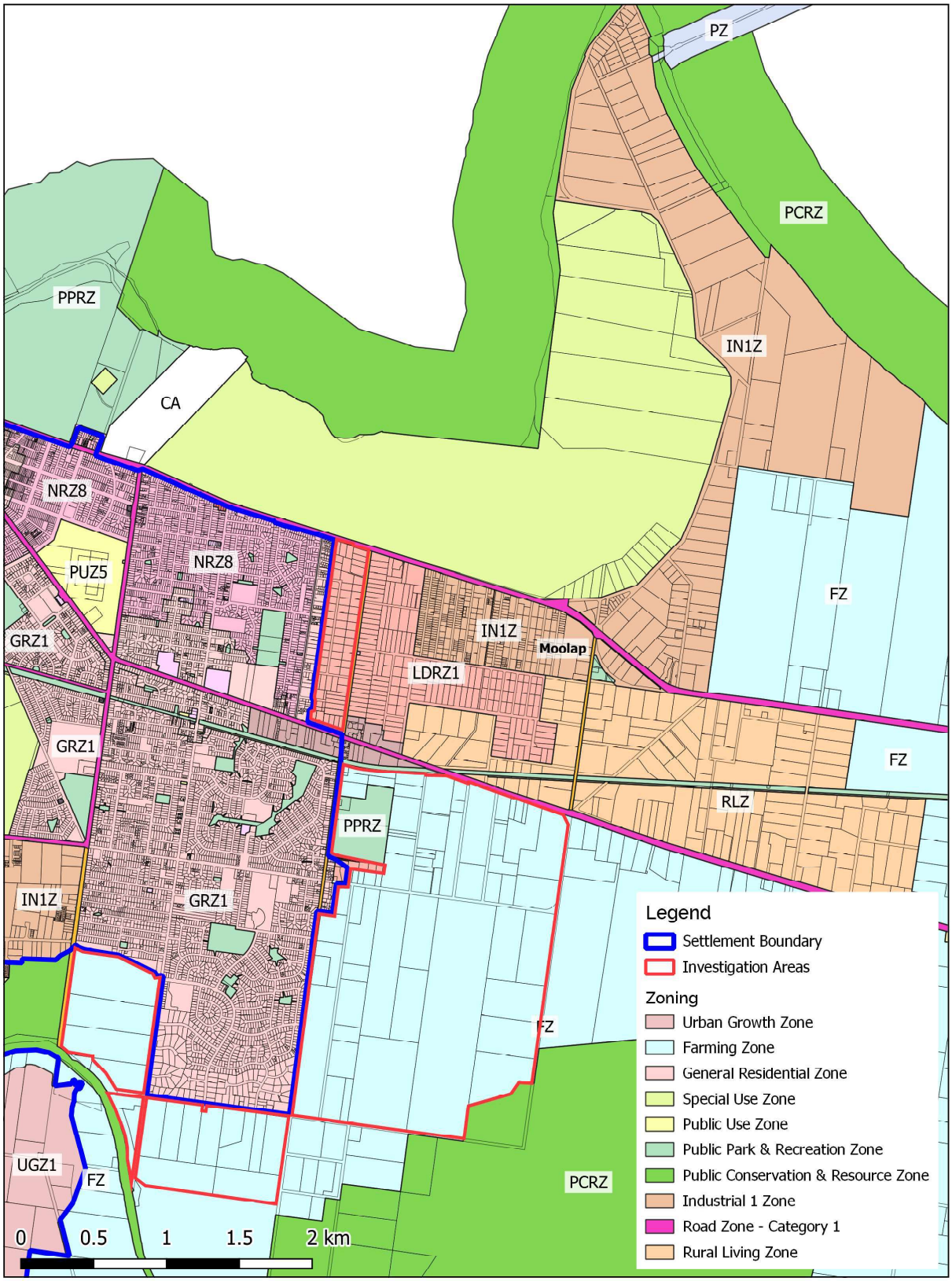


Figure 42. Moolap – Zoning Plan.

Geelong Growth Investigation Areas

Moolap - Overlays

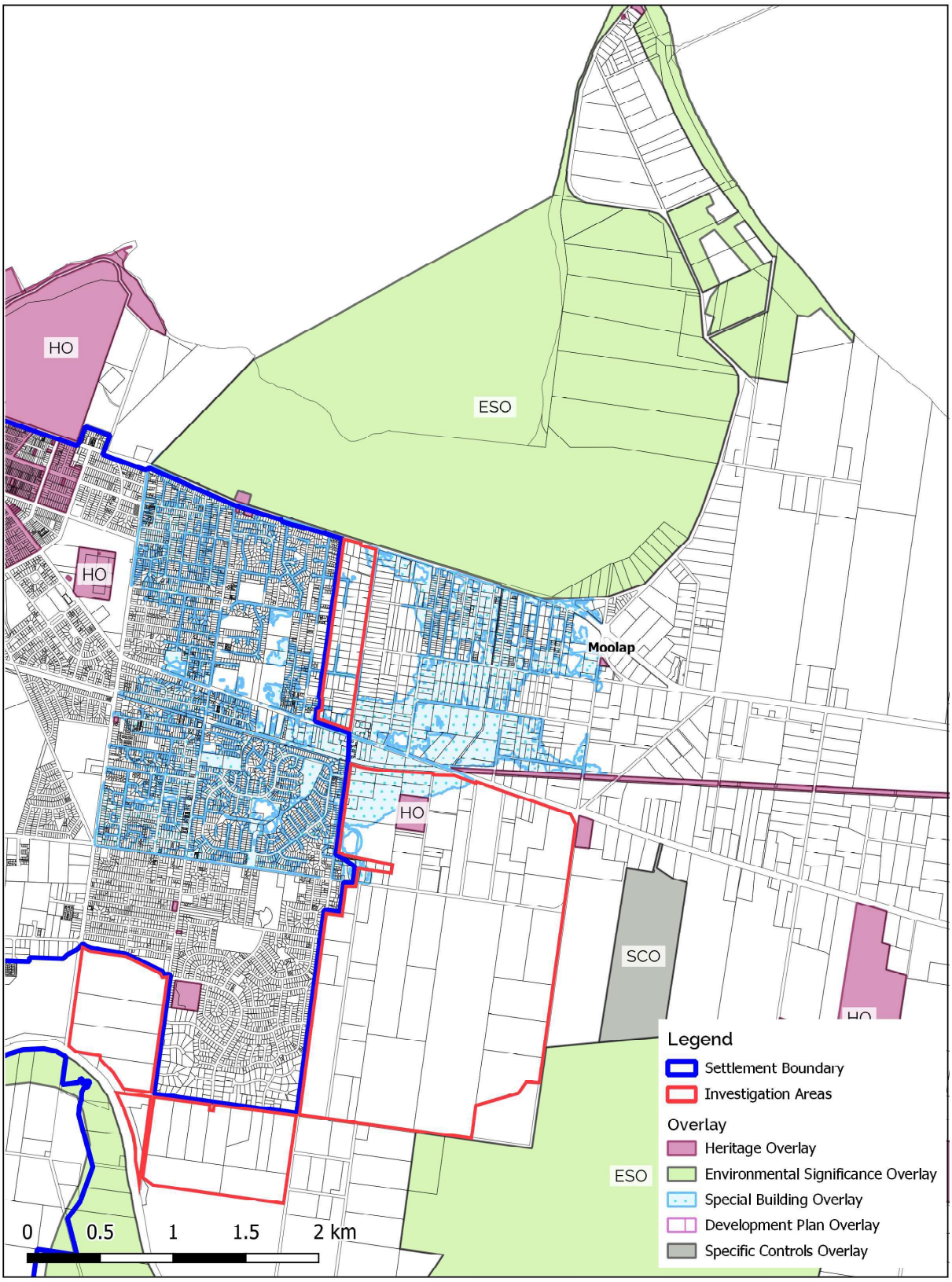


Figure 43. Moolap – Overlays Plan 1.

Geelong Growth Investigation Areas

Moolap - Overlays

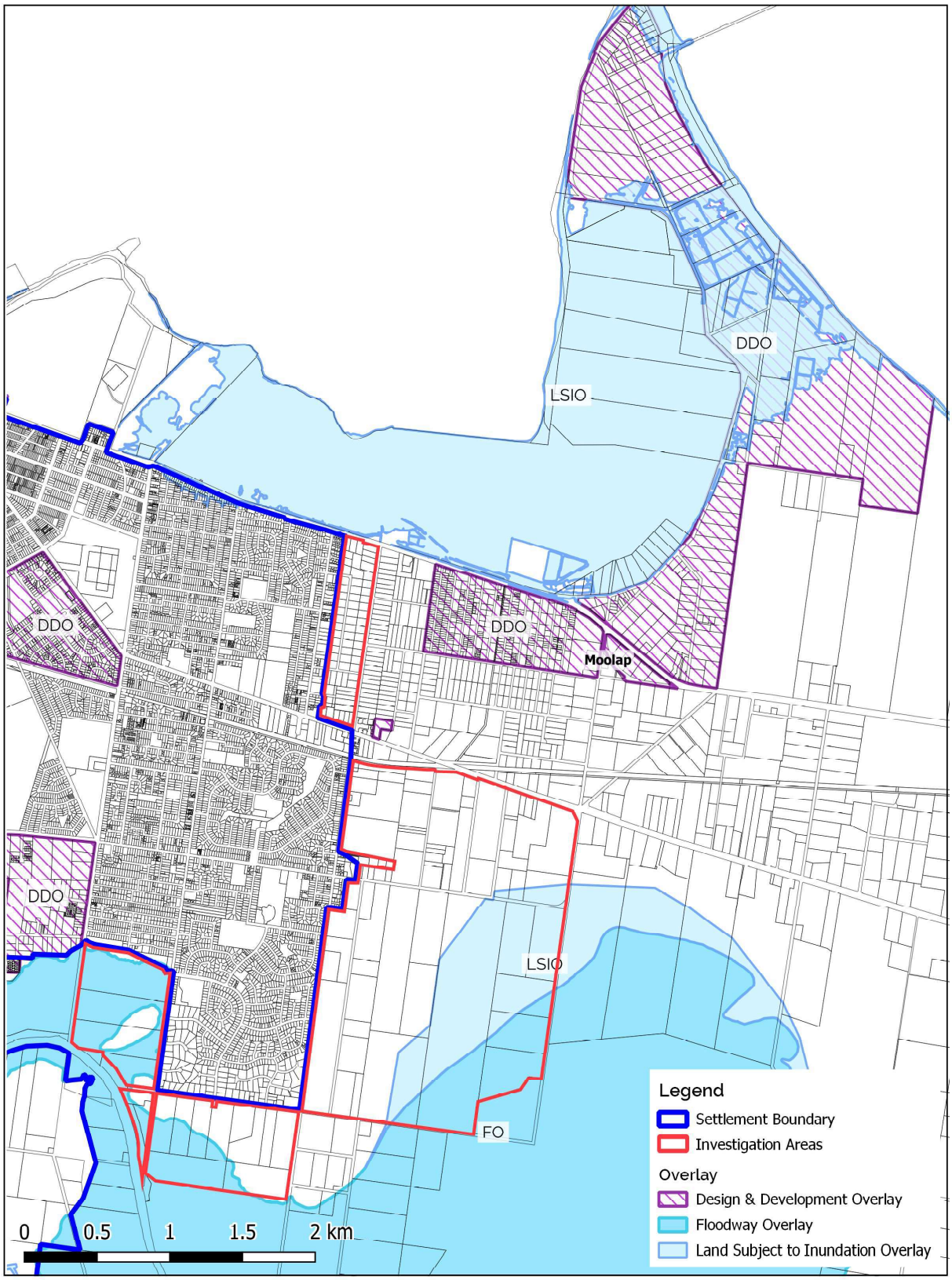


Figure 44. Moolap – Overlays Plan 2.

Figure 45. Moolap – Photo Montage.

1.4 Investigation Area & Surrounds:

The investigation area is generally flat and low-lying. It is bounded by significant natural areas to the north and south, being Stingaree Bay to the north of Portarlington Road and Reedy Lake / Lake Connewarre conservation reserve and Barwon River to the south.

This area currently provides a visual break between the two urban areas and is understood to be valued by the community as part of the retention of the open landscape character that defines Geelong and the Bellarine Peninsula. Land within the northern part of the area has been developed with low density housing whilst land to the south remains rural and is used for agriculture and agistment purposes.

The Grinter Reserve comprises sporting fields, an aquatic centre, BMX track and other sporting facilities.

The following land uses are located to the north and north-west of the area:

- Wetlands and coastal foreshore reserve
- Former Cheetham Saltworks
- Former Aluminium smelter and rolling mill
- Industrial areas, including chemicals and munitions manufacturing facilities
- Low density residential activities to the immediate west

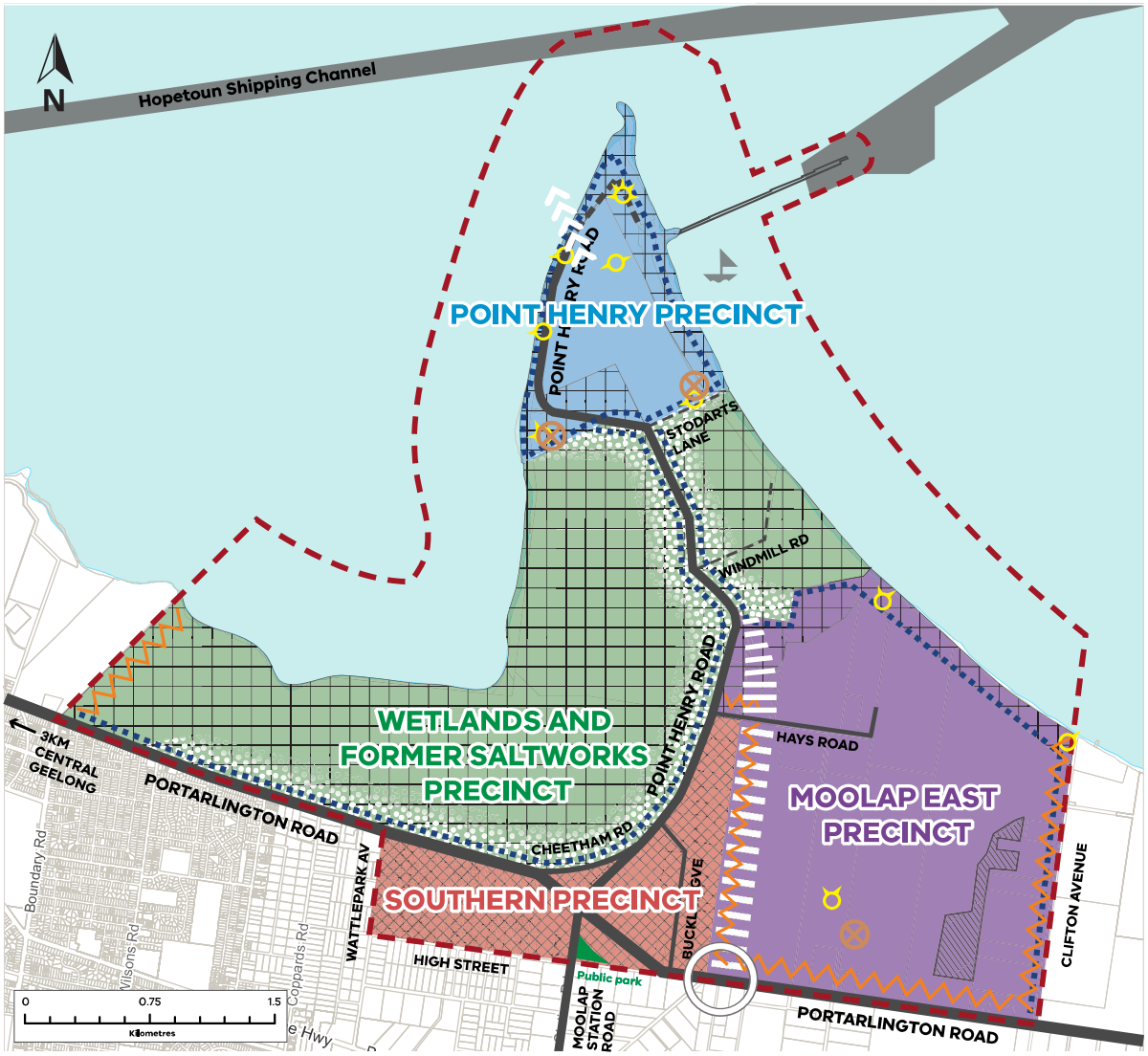
The nearest industrial zoned land is circa 400m to the west of Coppards Road.

Land to the immediate south of the area is affected by floodplains associated with the Barwon River and the Lake Connewarre reserve. Lake Connewarre and its environs are projected by various international, national, state and local policies and legislation for the protection of sites of flora and fauna significance.

1.4.1 Moolap Coastal Strategic Framework Plan

The Moolap Coastal Strategic Framework Plan has been prepared to guide the long term redevelopment of the coastal and industrial land north of the area (refer Figure 46). This Plan supports residential development, tourism, environmental parkland, and the continuation of industrial businesses on land within that precinct. There are a number of significant industrial uses which continue to operate from this area, which places limitations on the introduction of sensitive uses within close proximity to that precinct (refer Figure 47).

Figure 46. Extract from Moolap Strategic Framework Plan (p.15).



LEGEND

Residential and Tourism (subject to remediation of the land), includes medium-high density development, permanent residential and temporary accommodation, tourist facilities as well as commercial and community facilities to meet the needs of residents and visitors.

Environmental including bird habitats, public open space, stormwater management, environmental, historical and cultural values and complementary infrastructure and facilities.

Industrial including light and medium industry and commercial businesses to provide local services and employment while avoiding off-site impact on residential neighbours.

Residential (subject to Dow Chemical deciding to relocate and remediation of the land), includes a range a residential densities, with community, retail and commercial facilities to meet the needs of the study area.

- Study area boundary
- Existing Roads
- Potential connection to Bellarine Link (indicative)
- Protect a long-term strategic road alignment (indicative)
- Potential intersection upgrade associated with the potential connection with Bellarine Link (indicative)
- Provide trails and pedestrian connections (indicative)
- Marine infrastructure and facilities
- Provide an appropriate interface
- Rehabilitate previous land fill prior to a new sensitive use
- Respond to predicted sea level rise including coastal retreat and protection measures (while maintaining a public owned foreshore)
- Retain and support public access to key views
- Investigate improvements to stormwater management and connection to reticulated sewer
- Potential area for infrastructure/ utilities, and where it complements environmental management and conditions, facilities and buildings for tourism, research and culture/heritage (excluding residential).
- Manage the Moolapio grasslands

Figure 47. Extract from Moolap Strategic Framework Plan (p.3).

1.4.2 Bellarine Distinct Areas and Landscapes

The Bellarine Peninsula has been declared as distinctive area and landscape under Section 46A of the Planning and Environment Act 1987, and a draft Statement of Planning Policy (SPP) has been prepared in relation to the declared area.

The draft SPP notes that the unique attributes of the Bellarine Peninsula include its Wadawurrung living cultural and historic heritage, biodiversity, significant landscapes, natural resources, productive land, strategic infrastructure and built form — and that these attributes need protection against overuse, overdevelopment and climate change impacts.

The draft SPP identifies the Reedy Lake/Lake Connewarre area as an area of high conservation significance. It notes that better management of urban stormwater run-off into these adjacent wetlands and waterways is a priority within the declared area and upstream, to better protect their values.

The draft SPP also identifies land within the investigation areas as being a regionally significant landscape. It contains an Objective to protect and enhance the identified landscape character, physical features, view corridors and natural and cultural values of the declared area's significant landscapes. The following Strategies have been proposed to achieve this objective:

- Protect the coastal and hinterland settings of settlements by containing urban growth and development within settlement boundaries.
- Reserve green breaks between settlements for conservation, agriculture, nature-based tourism and natural resource purposes that prioritise the protection and enhancement of the significant landscapes and landscape characters.

The Bellarine DAL notes that protected settlement boundaries are needed for this area, to ensure the green break between urban Geelong and the Bellarine Peninsula is preserved and significant landscape and environmental values are protected.

It notes that the resolution of this protected settlement boundary will be informed by further strategic planning work led by the City of Greater Geelong in consultation with DELWP and other relevant agencies. It also notes that this work will include consideration of urban/rural transition areas that support the regionally significant landscape setting.[1]

1.4.3 Bellarine Link Road

The Victorian Government has identified the need to develop the Geelong Ring Road Extension (Bellarine Link) in multiple stages to address immediate growth needs in the following locations:

- Surf Coast Highway to Barwon Heads Road
- Barwon Heads Road to Portarlington Road.

Funding has been allocated in the 2021-22 Budget to progress planning for a link between the Surf Coast Highway and Barwon Heads Road. This includes traffic modelling, planning studies and environmental investigations which will help us understand the environmental and social impacts, develop design options and confirm scope and costs.

Whilst a preferred alignment has not yet been identified, the indicative location of the link is shown in Figure 48. This notional alignment runs generally north of the wetlands and associated flood prone areas to their north, along the southern edge of the investigation area before running diagonally form a proposed bridge crossing of the Barwon River across Coppards Road to the Bellarine Highway.

1 Page 58.

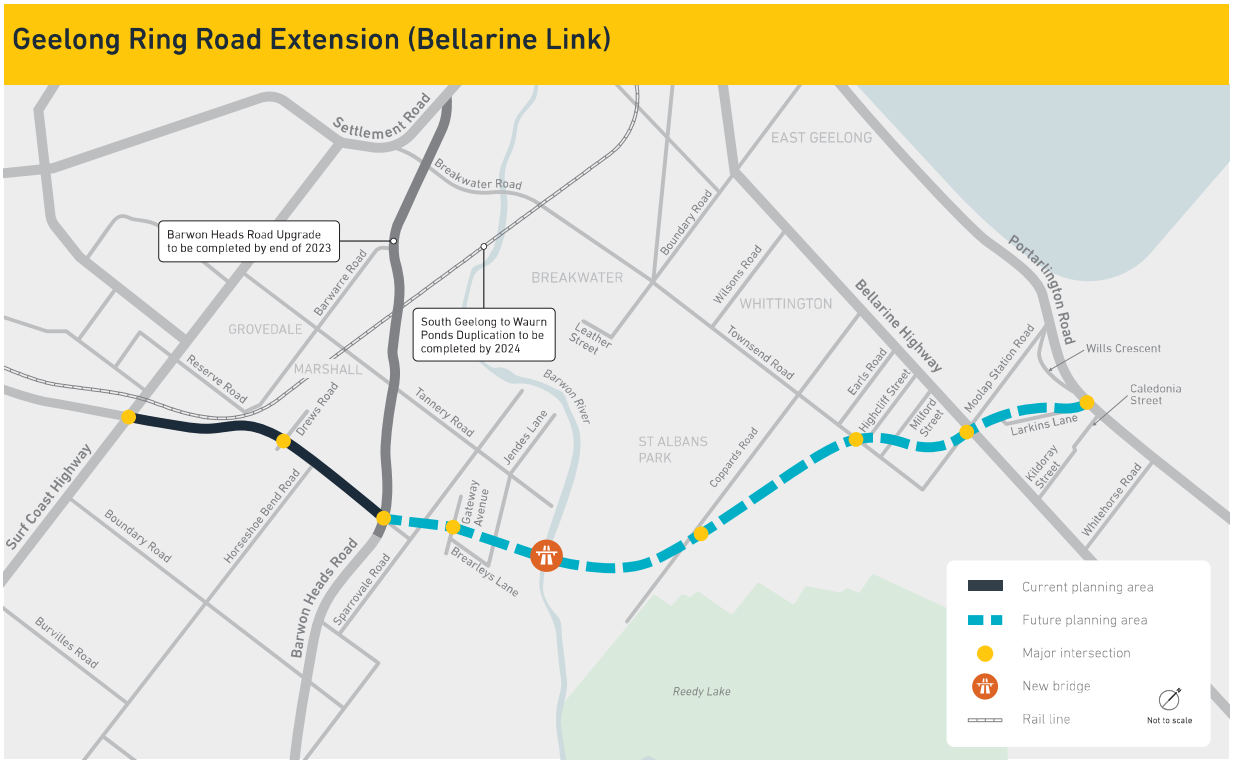


Figure 48. Indicative alignment of the Bellarine Link (source: www.bigbuild.vic.gov.au/projects/mrpv/geelong-ring-road-extension-bellarine-link).

2 - Summary of Recent Submissions in Relation to the Settlement Boundary

We have reviewed the submissions in relation to the Geelong Settlement Strategy (Planning Scheme Amendment C395).

None of the submissions related to land within the Moolap area.

However it is understood eleven submissions were made in support of further development in Moolap as part of the informal Settlement Strategy consultation.

3 - Assessment of Investigation Area Against Suitability Criteria

The following is an assessment of the investigation area against the Long Term Boundary review Decision Criteria.

3.1 - Settlement:

Criteria 1.1: Impacts of any proposed changes on the establishment of logical and enduring settlement boundaries (including consideration of natural features, location of major roads and reservations for public utilities).

Northern section of the Moolap investigation area:

The existing settlement boundary in the northern part of the investigation area is located on the rear title boundary of lots within the General Residential Zone along Helms Street.

The rear boundary of lots is not an optimal location for a long-term settlement boundary. Ideally the boundary in this location would be on a road, with the practical options being either Helms Road or Coppards road.

The lots on the west of Helms Road are already in an urban zone (GRZ) and developed for urban residential purposes, and therefore they should remain within Geelong's long-term settlement boundary.

Coppards Road could serve as an alternative long term settlement boundary. However, including the lots between the GRZ and Coppards Road would serve little purpose in terms of enhancing the local neighbourhood or making efficient use of existing infrastructure.

The existing lots in this area are typically 0.4ha (or larger) in area and have been developed for low density residential purposes. It is likely that delivering urban services to this land will be expensive and complex, given the low-lying and flat nature of this area (refer further discussion under criteria 8.2).

The marginal benefit of using Coppards road as an alternative long term boundary is outweighed by the facts that including this additional land within the boundary does not create any particular long term benefits for the Moolap community or Geelong more broadly.

Southern section of the Moolap investigation area:

The existing settlement boundary in the southern part of the investigation area is located along Coppards & Woods Roads. These roads currently function as a clear and logical long term settlement boundary, and can readily function as an enduring boundary over time.

Land south of Woods Road forms part of the wider Reedy Lake and Barwon River floodplain. There are currently no other natural or constructed features in this location that would represent a more logical or enduring long term settlement boundary in this direction.

The following potential alternative settlement boundaries have been considered for land to the east of Coppards Road:

- Earls and Woods Road (narrow rural roads located circa 600m and 200m west of Coppards Road).
- Moolap Station Road (located circa 1.6km west of Coppards Road).

Land in these areas form part of a wider rural area which has value for agricultural, environmental and landscape purposes (refer assessment against other suitability criteria in this report). It is understood that delivering urban services to this land will also be expensive and complex, given the low-lying and flat nature of this area (refer further discussion under criteria 8.2).

The former of the above two options would create marginal benefits in terms of enhancing the local neighbourhood or making efficient use of existing infrastructure.

The latter option would result in a very substantial land area (circa 350ha) being included within the settlement boundary. Given that the recently completed Geelong Settlement Strategy has set the larger-scale long term land supply for the city, including significant additional land areas within the settlement boundary for land supply purposes is not needed and therefore not a relevant consideration for this review.

Neither of the above alternative long term settlement boundary options are considered to be more logical or enduring than the existing boundary, and each would present potential issues in terms of provision of urban services, and impact on agricultural, natural and landscape values of this area.

The Bellarine Link Road alignment might potentially create a more logical and enduring settlement boundary than the current boundary at a future point in time. However, neither the alignment of this road or the timeframe for its delivery are resolved at this point. It would still also be necessary to determine the impact of including existing rural land on the 'urban side' of this road alignment into the settlement boundary on the agricultural, environmental and landscape values of this area.

The potential implications of the future Bellarine Link Road on the location of Geelong's long term settlement boundary in this location should be reviewed once there is greater definition of the alignment and commitments to deliver the road.

The current settlement boundary satisfies this Criteria.

The potential alternative settlement boundary locations are no more logical or enduring, and present issues and challenges relating to other suitability criteria.

Any change to the settlement boundary (other than minor changes) would therefore have a negative impact on the satisfaction of this criteria.

3.2 - Managing Growth:

Criteria 2.1: Impact on the orderly development of the adjoining urban area.

The northern part of the investigation area has access to a government primary and secondary school, non-government primary school and sporting facilities. The inclusion of relatively small number of additional dwellings within the northern part of the investigation area is likely to have only a marginal impact on the orderly development of these adjoining areas.

The southern part of the investigation area has access to two government primary schools, a community centre and sporting facilities. Residents in this area have access to a government secondary college on the north side of the Bellarine Highway.

Application of the social infrastructure benchmarks set out in the methodology chapter of this report suggests that the existing population in this area would optimally have access to more 'community centre' and sporting facilities than currently provided.

The addition of any significant areas of residential land into the Geelong Settlement Boundary in this location will place additional demands on existing social infrastructure. It would therefore be necessary to upgrade and/or expand the existing social infrastructure in this neighbourhood to cater for additional demands.

The addition of any significant area of residential land into the Geelong Settlement Boundary in the southern part of the investigation area is likely to have a negative impact on the orderly development of the adjoining residential area. The scale of the impact would depend on the area of land included.

Any change to the settlement boundary (other than minor changes) would therefore have a negative impact on the satisfaction of this criteria.

Criteria 2.2: Impact on management of the sequence of development and the early provision of services.

The intensification of development within the northern part of the investigation area would require either substantial lot consolidation or the substantial use of 'battle-axe' type lots.

It is likely that redevelopment for urban residential purposes within the constraints of the existing subdivision pattern would occur on an incremental and piecemeal basis. This will present significant challenges to providing efficient and cost-effective drainage works and utility services to this area.

Any change to the settlement boundary would have a negative impact on the satisfaction of this criteria in relation to the orderly development northern part of the investigation area.

Criteria 2.3: Impacts of any proposed boundary changes on the economic provision of other development fronts.

Any significant changes to the settlement boundary in this location would result in the City's expenditure on growth area infrastructure having to be spread more thinly across a wider area than envisaged under the Settlement Strategy. This would potentially have an adverse impact on the economic provision of other development fronts in the wider Geelong region.

Any change to the settlement boundary would have a negative impact on the satisfaction of this criteria.

3.3 - Planning for Places – Distinctive Areas & Landscapes:

Criteria 3.1: Impact on any identified unique features or special characteristics within a declared area.

The area is located within a Declared Area under the Distinctive Areas and Landscapes legislation, and the draft SPP identifies land within the investigation areas as being a regionally significant landscape.

The landscape assessment undertaken as part of the draft DAL Strategy includes the investigation area in a landscape type known as 'Localised Flatlands: Lake Connewarre Lowlands'. It describes the sensitivity change in this area as follows:

> "The low, flat and environmentally significant wetlands environs of this Landscape Area make it particularly sensitive to most forms of development. Built form has the potential to be visually impactful when viewed from main road corridors…"[1]

The landscape assessment identifies land within the investigation area as forming part of a broader area of Regional landscape significance known as 'Bellarine Northern Coast and Central Hills: Regional Significance' (refer Figure 49).

The draft SPP contains an Objective to protect and enhance the identified landscape character, physical features, view corridors and natural and cultural values of the declared area's significant landscapes.

The following strategies have been proposed in the draft DAL Strategy to achieve this objective:

- Protect the coastal and hinterland settings of settlements by containing urban growth and development within settlement boundaries.

1 Bellarine Peninsula Landscape Assessment Review, Vol 1 page 40.

- Reserve green breaks between settlements for conservation, agriculture, nature-based tourism and natural resource purposes that prioritise the protection and enhancement of the significant landscapes and landscape characters.

The Bellarine DAL strategy notes that protected settlement boundaries are needed for this area, to ensure the green break between urban Geelong and the Bellarine Peninsula is preserved and significant landscape and environmental values are protected.

Land within and adjoining the investigation area is not currently included within a Significant Landscape Overlay (SLO) under the Greater Geelong Planning Scheme. The landscape assessment that accompanies the Draft SPP does not recommend that any SLO be applied to land within or immediately adjoining the investigation area.

Whilst the landscape within the investigation area could therefore be said to have Regional significance, it has not been assessed as having a level of significance that warrants protection via an SLO planning control.

However, the draft DAL SPP (and the Geelong Settlement Strategy) calls for urban growth to be contained within settlement boundaries and for green breaks to be reserved between urban Geelong and other settlements within the Bellarine Peninsula.

The purpose of such breaks is to preserve land for a combination of conservation, agriculture, nature-based tourism and landscape purposes.

An extension of the settlement boundary within the investigation area would reduce the size of the green break between urban Geelong and Leopold, and it would place greater pressure on the conservation values of the nearby Reedy Lake and Lake Connewarre. It would also reduce the land area available for agriculture and nature-based tourism activities.

In summary, the extension of the boundary in this location will have a potentially negative effect on the following DAL objectives for the Bellarine Peninsula:

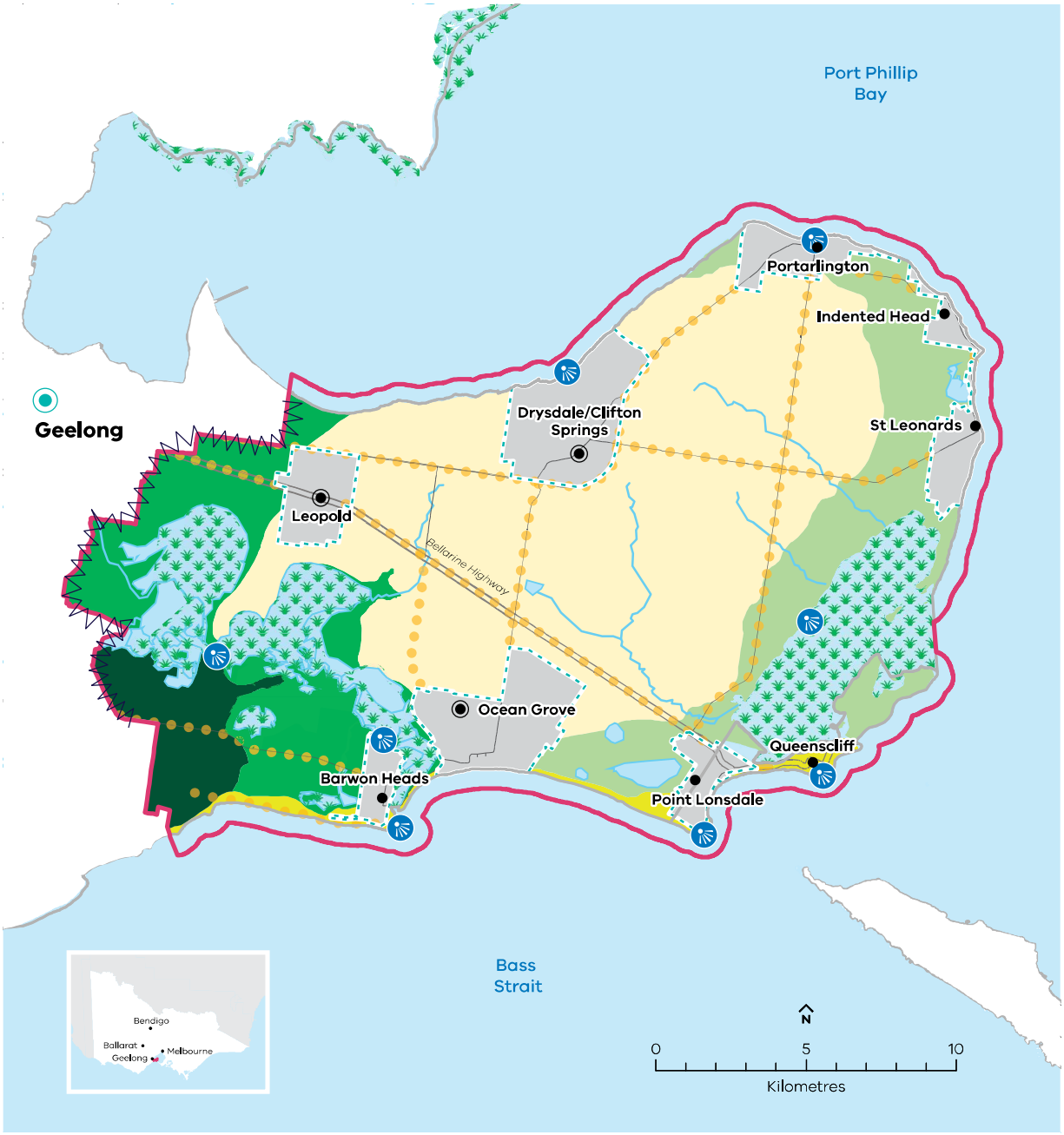
- Enhancing the conservation of the environment (due to potential impact on flood prone land within the area, and potential downstream impacts on Reedy Lake/Lake Connewarre).
- Protection and conservation of regionally significant landscape values of Bellarine Northern Coastal & Central Hills Landscape.

Any change to the settlement boundary would have a negative impact on the satisfaction of this criteria.

LEGEND

- Regional city
- District town
- Village
- Protected settlement boundary
- Declared area boundary
- Protected settlement boundary to be defined subject to strategic planning work
- Local Government Area
- Urban area
- **State significant landscape:** Bellarine Peninsula Southern Coast
- **Regional significant landscape:** Lake Connewarre and Barwon River
- **Regional significant landscape:** Swan Bay
- **Regional significant landscape:** Bellarine Northern Coast and Central Hills
- Road corridor views
- Significant view
- Waterways
- Lakes
- Ramsar wetlands
- Highway
- Main road

Figure 49. Bellarine Significant Landscape Areas (draft Bellarine DAL SPP, p.34)



LEGEND

- Regional city
- District town
- Village
- Protected settlement boundary
- Declared area boundary
- Protected settlement boundary to be defined subject to strategic planning work
- Local Government Area
- Urban area
- Western Plains Cones and Lakes, Mount Duneed Volcanic Plain
- Localised Flatlands, Lake Connewarre Lowlands
- Localised Flatlands, Lake Victoria, Swan Bay
- Coastal Cliffs and Dunes, Bellarine Southern Coast
- Bellarine Uplands, Central Bellarine Hills
- Road corridor views
- Significant view
- Waterways
- Lakes
- Ramsar wetlands
- Highway
- Main road

Figure 50. Bellarine Landscape Character Types (draft Bellarine DAL SPP, p.35)

3.4 - Environmental & Landscape Values:

Criteria 4.1 Impact on the protection of biodiversity values.

The investigation area adjoins the Barwon River and Reedy Lake/Lake Connewarre wetlands systems. These wetlands are designated as "wetland of international significance" under the Ramsar convention and they provide significant habitat for a range of plant and animal species, including endangered migratory bird species listed under the Japan–Australia Migratory Bird Agreement (1981) and the China–Australia Migratory Bird Agreement (1988).

These wetlands are sensitive natural environments which are particularly vulnerable to the impacts of urban development and climate change. The importance of protecting of these habitats is identified across a wide range of international, federal, state and local policies and regulations.

Better management of urban stormwater run-off into these wetlands is a high priority. This includes sensitively managing stormwater flows and quality by redirecting, storing and treating it before it flows into sensitive habitats and investing in infrastructure to harvest stormwater for reuse before it enters natural systems.

Any change to the settlement boundary would have a potentially negative impact on the satisfaction of this criteria, as the relevant biodiversity values within the adjacent wetlands are highly sensitive to changes in stormwater flow and quality.

Criteria 4.2 Impact on the protection of coastal areas & wetlands.

Refer criteria 4.1 for discussion.

Any change to the settlement boundary in this area would have a potentially negative impact on the satisfaction of this criteria, for the reasons set out under Criteria 4.1.

Criteria 4.3 Impact on the protection of significant landscapes.

Land within and adjoining the investigation area is not currently included within a Significant Landscape Overlay (SLO) under the Greater Geelong Planning Scheme.

The landscape within the investigation area has been identified in the Bellarine DAL SPP as have Regional significance. Whilst this landscape has not been assessed as having a level of significance that warrants protection via an SLO planning control, both the draft Bellarine DAL SPP and the Geelong Settlement Strategy call for green breaks to be reserved between urban Geelong and other settlements within the Bellarine Peninsula (Refer Criteria 3.1 and 4.4 for further discussion).

Expanding residential development into this rural landscape would have a negative impact on the rural landscape break between Geelong and Leopold although these impacts could be mitigated via subdivision and landscape design measures to some degree.

Any change to the settlement boundary is expected to have a negative impact on the satisfaction of this criteria.

Criteria 4.4 Impact on the preservation of identified urban breaks.

The Greater Geelong Planning Scheme (at Clauses 11.01-1R, 21.06-2 and 21.14) seeks to maintain the non-urban breaks between urban Geelong and the Bellarine Peninsula.

The Geelong Settlement Strategy notes the following in relation to urban breaks in this location:

> "The State Planning Policy Framework clearly states that a non-urban break should be maintained here. However, without the support of further development controls and landscape polices, the existing visual break between Newcomb/Moolap and Leopold could be progressively eroded until Leopold functions, and is perceived, as the eastern edge of urban Geelong."[2]

Expanding residential development into the rural landscape between Moolap and Leopold would have a negative impact on the green break between Geelong and Leopold although these impacts could be mitigated via subdivision and landscape design measures to some degree.

Any change to the settlement boundary would have a negative impact on the satisfaction of this criteria.

3.5 - Environmental Risks:

Criteria 5.1 Climate change – impacts of coastal inundation & erosion.

Parts of the investigation area are affected by coastal inundation and flooding.

The Flood Overlay, LSIO and SBO currently apply to areas of land within the investigation area, and Amendment.

Amendment C339 to the Greater Geelong Planning Scheme proposes to update flooding and inundation controls that apply to land within the investigation area (refer Figure 51). The Amendment implements the Lower Barwon and Lower Moorabool Flood Investigation (Dec 2018) and part of the Bellarine Peninsula – Corio Bay Local Coastal Hazard Assessment (Dec 2015).

The Amendment seeks to satisfy the following State policy objective relating to climate change and coastal inundation:

> "To plan for the potential coastal impacts of climate change and implements the following strategies:
>
> - Plan for sea level rise of not less than 0.8 metres by 2100 and allow for the combined effects of tides, storm surges, coastal processes and local conditions such as topography and geology when assessing risks and coastal impacts associated with climate change.
> - Ensure that land subject to coastal hazards is identified and appropriately managed to ensure that future development is not at risk.
> - Avoid development in identified coastal hazard areas susceptible to inundation."

The revised boundaries of the Flood Zone and LSIO affect land in the southern portion of the investigation area.

Any change to the settlement boundary in the southern portion of the investigation area would have a negative impact on the satisfaction of this criteria.

2 Geelong Settlement Strategy, page 79.

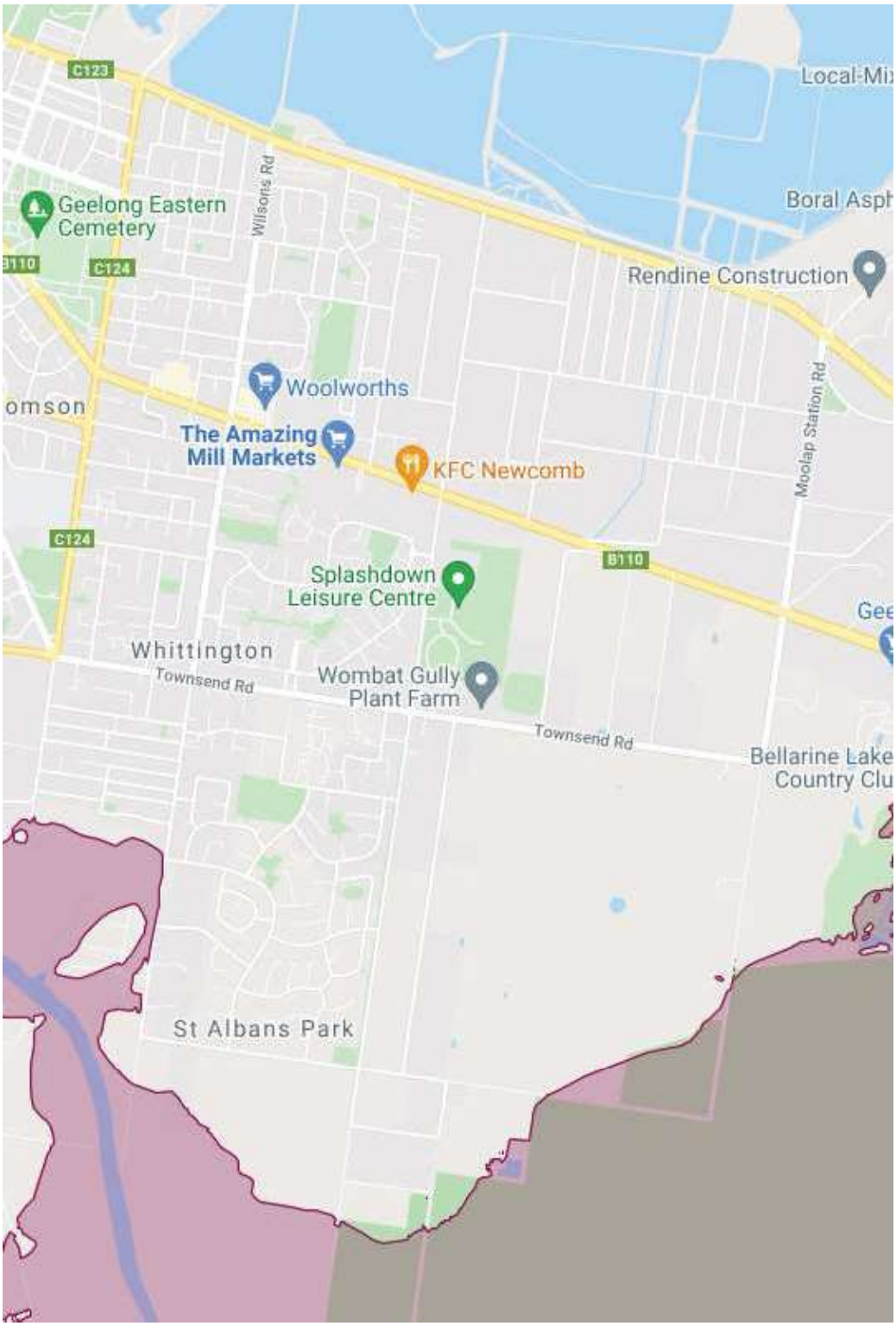


Figure 51. Proposed revised extent of the Flood Overlay (draft Amendment C339, https://www.geelongaustralia.com.au/amendments/item/8d8c14bb1962deb.aspx)

Criteria 5.2 Bushfire risks in the location.

This area is within a Bushfire Prone Area but is not located within or proximate to a Bushfire Management Overlay. Bushfire risk is not likely to be determinative of the suitability of urban development in the area. A Bushfire Management Plan could be prepared to manage the potential risks posed by bushfire on urban development in the area.

Any change to the settlement boundary would have a neutral impact on the satisfaction of this criteria

Criteria 5.3 Impacts on/of floodplains.

Parts of the investigation area are affected by coastal inundation and flooding.

The Flood Overlay, LSIO and SBO currently apply to areas of land within the investigation area, and Amendment, and Amendment C339 to the Greater Geelong Planning Scheme proposes to update flooding and inundation controls that apply to land within a close to the investigation area (refer criteria 5.1 for further discussion).

The northern portion of the investigation area is low lying and as liable to inundation by overland flows from the surrounding drainage networks. This area is included within the SBO under the Greater Geelong Planning Scheme. The constraints imposed by these controls on urban development would need to be further investigated before these areas could be identified as being suitable for urban development.

Any change to the settlement boundary in the southern portion of the investigation area would have a negative impact on the satisfaction of this criteria.

Any change to the settlement boundary in the northern portion of the investigation area would have a minor or potentially neutral impact on the satisfaction of this criteria, depending on what more detailed investigation of flooding conditions and mitigation measures were to confirm.

Criteria 5.4 Impacts on/of soil degradation.

The Geological Survey of Victoria (1:63,360) Geological Map Series Geelong Sheet indicated that the area is underlain by High level alluvium deposits (sand, gravel and clay).[3]

No soil degradation impact risks have been identified in the desktop review for this area.[4]

Any change to the settlement boundary might potentially have a neutral impact on the satisfaction of this criteria, however if development was approved in this area further analysis would be required to investigate soil conditions and the impact development might have on soil degradation.

Criteria 5.5 Impacts on/of erosion & landslip.

The area is identified as having a moderate risk of gully and sheet erosion.[5]

Any change to the settlement boundary is expected to have a neutral impact on the satisfaction of this criteria, however if development was approved in this area further analysis would be required to investigate soil conditions and the impact erosion and landslip might have on development, and vice-versa.

Criteria 5.6 Impacts on/of salinity, acid sulfate soils.

Areas adjoining the Barwon River, Reedy Lake and Stingaree Bay are impacted by salinity associated with these waterways and wetlands features. The majority of the investigation has been identified as having a high waterlogging risk and also having potential for the presence of acid sulfate soils.[6]

3 See map sheet 9 - http://earthresources.efirst.com.au/categories.asp?clD=33
4 https://www.ccmaknowledgebase.vic.gov.au/nrmpp
5 Ibid.
6 Ibid.

Any change to the settlement boundary is expected to have a negative impact on the satisfaction of this criteria, however further analysis would be required to investigate these soil conditions and the degree to which salinity, waterlogging acid sulfate soil conditions might impact on development, and vice versa.

Criteria 5.7 Land use compatibility – compatibility with nearby agricultural, industrial, extractive industry, tourism and other established and valued land uses.

The northern part of the area is 380m from an industrial zone which accommodates predominately light industrial uses, and 1.5-2km from the heavier industries located within the Moolap Strategic Framework Plan area.

The land between these industrial activities and the existing settlement boundary is currently zoned for low density residential purposes. The encroachment of urban-density residential development towards the existing industrial zone in Moolap might potentially impact on the buffer requirements of existing industrial activities and reduce the capacity of these areas to cater for certain types of industry which require large buffer distances in the future.

The southern portion of the investigation area is adjacent to farmland and so the compatibility between urban and farming uses would be a design consideration. However, incompatibility with adjacent agricultural uses is not likely to be determinative of the suitability of urban development in the area.

Any change to the settlement boundary is expected to have a minor negative impact on the satisfaction of this criteria.

Criteria 5.8 Impacts on/of major hazard facilities.

There are no licensed major hazard facilities located in proximity to this area.[7] However, there are pharmaceutical and munitions manufacturing activities located circa 2.5km north-east of the investigation area.

Any change to the settlement boundary is not expected to have an impact on the satisfaction of this criteria.

3.6 - Natural Resource Management:

Criteria 6.1 Impact on the protection of agricultural land.

The Greater Geelong Planning Scheme seeks to support the use of the land within the southern rural areas for productive agriculture.[8]

The investigation area has been identified as having a predominately Class 4 (Moderate) land capability. These are defined as follows:

> Class 4 – Land that is not as inherently capable for intensive soil-based agriculture. Extensive agriculture (including broadacre cropping with suitable land management practices) and non-soil utilisation activities are often most appropriate, and more intensive grazing is possible in some higher rainfall areas or where consistent water supplies are available.

The land holdings vary in size in the area, and the land is primarily used for agricultural production and agistment, with associated dwellings.

Any change to the settlement boundary is expected to have a moderately negative impact on the availability of land for agricultural production and therefore the satisfaction of this criteria.

7 https://www.worksafe.vic.gov.au/licenced-and-registered-major-hazard-facilities
8 Clause 21.07-4

Criteria 6.2 Impact on the protection of catchments, waterways, estuaries, bays, and the marine environment, protection of extractive resources.

The investigation area is located between the wetlands of the Barwon River, Reedy Lake and Stingaree Bay and land within it drains towards these environmentally sensitive features.

The investigation areas is flat, low-lying and subject to waterlogging and the emergence of acid-sulfate soils.

Urban development has a high potential to impact on the ground and surface water conditions within the investigation area and on the natural values of the wider catchment and nearby waterway and marine features.

It is possible that these impacts might be mitigated through the design of any urban stormwater infrastructure within the area. However, a thorough and detailed investigation would be required to verify whether this is possible or not.

Any change to the settlement boundary is expected to have a negative impact on the protection of nearby catchments and therefore the satisfaction of this criteria. Further detailed technical analysis would be required to investigate degree to the impacts of urban development on the environmental values of the catchment, and nearby waterway and marine environments.

Criteria 6.3 Impact on the protection of extractive resources.

The area is not identified as an Extractive Industries Interest Area, and there are no quarries located within 1km of the area.

3.7 - Heritage:

Criteria 7.1 Impact on known Aboriginal cultural heritage values.

Aboriginal Victoria mapping shows the land around the Barwon River, Reedy Lake and Stingaree Bay are areas of cultural heritage sensitivity.[9]

Any change to the settlement boundary is expected to have neutral impact on the protection of known areas of Aboriginal cultural heritage sensitivity. However, consultation with Traditional Owners and further assessment of other potential areas of Aboriginal cultural heritage sensitivity should be undertaken if land within this area was to be further considered for inclusion within the settlement boundary.

Criteria 7.2 Impact on known post contact heritage values.

A Heritage Overlay currently applies to a farming residence on Earles Road Moolap.

Any change to the settlement boundary is expected to have a neutral impact on the protection of known areas of post-contact cultural heritage sensitivity.

9 See https://achris.vic.gov.au/#/onlinemap

3.8 - Transport:

Criteria 8.1 Accessibility of the location, including the feasibility and cost of providing adequate public transport and roads access.

The area has access to existing road networks and it is located proximate to two existing local bus services. It would be necessary to re-route local public transport services to the area in order to connect residents to regional employment, health, education and other services.

However, the feasibility of providing roads and public transport to the area would not be determinative of the suitability of urban development in the area.

Any change to the settlement boundary is expected to have a neutral impact on the feasibility and cost of providing roads and public transport access to the area.

Figure 52. Existing nearby bus routes (source: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Regional/c7de90c6b9/Geelong-Bus-Network.pdf).

3.9 - Infrastructure:

Criteria 9.1 Ability to cost-effectively provide urban services including both utility, community services and drainage.

The investigation area is not currently serviced by reticulated sewer, and it does not have access to reticulated water infrastructure of sufficient capacity to support urban residential development. The nearest sewer and water networks are located in the adjacent suburbs of Newcomb and St Albans Park.

Any significant expansion of sewerage provision to the study area would require the installation of a new sewerage pump station and transfer pipeline from the area to the sewerage outfall drain near the Geelong Racecourse in East Geelong.

Careful consideration of sewerage servicing solutions will be required at this location due to the challenges of low elevation, flat topography, high saline water table, potential for environmental issues such as contaminated or acid sulfate soils.

The area's proximity to internationally significant wetlands means that a high level of assurance relating to protecting surface and ground water conditions from both urban stormwater and effluent flows would be necessary if urban further residential development were to be contemplated in this location.

It is possible that these impacts might be mitigated through the design of any urban reticulated sewerage and urban stormwater infrastructure within the area. However, a thorough and detailed investigations would be required to verify whether this is possible or not.

It is also likely that substantial augmentations and extensions to the reticulated water system would be required to supply new development in the area.

The existing social and recreational infrastructure in this location does not fully cater for the needs of the existing population in this area. Any increase in dwellings and population in this area will place additional demands on this existing social infrastructure. It would therefore be necessary to upgrade and/or expand the existing social infrastructure in this neighbourhood to cater for additional demands.

Given the above, and the constraints in the ability to develop land in the investigation area, it is likely that an expansion of the settlement boundary may not be able to cost-effectively provide for the range of the utility, drainage and community services needed to support further residential development in this location.

This would be influenced by the scale of urban residential development contemplated in the investigation area, and a more detailed assessment of the relevant environmental, physical and social impacts and mitigations.

The preliminary assessments undertaken as part of this review suggest that some significant additional drainage, utility and community infrastructure might be needed to support additional residential growth within this location.

The technical feasibility and cost-effectiveness of providing additional urban services to cater for additional housing growth in this location has not been examined as part of this desktop review. However, any change to the settlement boundary in this area is anticipated to have a negative impact on the ability to cost-effectively provide urban and social services to this area, as it would be necessary to upgrade and /or construct at least some new community facilities and utility services to cater for the additional demand, rather than being able to rely on available capacity within existing/planned urban services.