

McCann Family Land Expert Witness Report

Contract No.: 15410-04

Prepared on behalf of: McCann Family

Date: 6 November 2019

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1 Witness Statement & Qualifications

Name and Address

Name: Leigh Prossor
Company: CardnoTGM Pty Ltd
Level 1, 27 – 31 Myers Street
Geelong VIC 3220
Position: Civil Engineering Manager

Qualifications B. Eng (Hons)

I have 17 years' experience in civil engineering and urban development since graduating from Swinburne University with a Bachelor of Engineering in 2002.

I am currently employed as the Civil Engineering Manager of the CardnoTGM Geelong Office and have been employed with CardnoTGM since 2002. I am responsible for overseeing a team of approximately 30 professional staff undertaking master planning, project management, civil design and construction supervision roles on various project types for urban development and infrastructure projects within the Geelong and wider region.

I also work closely with CardnoTGM's survey and planning disciplines to provide civil design solutions for roads, drainage, sewerage, earthworks and water infrastructure for a variety of projects. These projects range from the initial front end, high level master planning, right through to the detailed design, project delivery and construction phases of projects.

Areas of Expertise

My areas of expertise include:

- > Managing the Civil Engineering unit of CardnoTGM's Geelong office.
- > Engineering advice on infrastructure requirements for the planning, design and delivery on urban development and major infrastructure projects.
- > Provision of Civil engineering design solutions to urban developments, Local and State Government projects.
- > Stormwater Investigations, Site Stormwater Management Plans (SSMP) and Storm Water system design to Authority requirements
- > Preparation of development feasibility studies.
- > Provision and coordination of service authority infrastructure requirements for urban developments.
- > Contract administration and supervision.
- > Project management.

2 Introduction / Instructions

CardnoTGM have been instructed by Norton Rose Fulbright to provide engineering assessment and expert witness advice around the servicing of the proposed development of the McCann Family Land in the Western Growth Area (subject area). Specifically we have been asked to;

- > review this letter and the enclosed documents (as relevant to your area of expertise);
- > confer with instructing solicitors and counsel where necessary;
- > consider issues raised by our client's submission concerning the Church Street Arterial Road Connection and the proposed McCanns Lane Precinct boundary realignment in the Western Growth Area; and
- > prepare an expert report which must set out all the matters required by the PPV Guide to Expert Evidence April 2019 (Guide) and (as set out in the Guide) you should not provide a revised version of the advice already provided (Advice), but simply include the matters required to be addressed by the Guide, i.e.:
 - a) a clear reference to the earlier Advice (and attach that Advice to your report);
 - b) details of your role in preparing or overseeing the earlier Advice;
 - c) confirmation that you adopt the earlier Advice and identifying:
 - i. any key assumptions made in preparing the Advice (if not already contained in the Advice);
 - ii. any departure from findings or opinion expressed in the earlier Advice, and why;
 - iii. any questions falling outside the expert's expertise; and
 - iv. whether the earlier Advice is incomplete or inaccurate in any respect;
 - d) details of any changed circumstances or assumptions since the earlier Advice was prepared, and whether these affect the opinions expressed in the earlier Advice; and
- > if instructed, appear at the Panel Hearing of this matter on 31 January – 1 February 2020.

3 Scope of Works

This review has been prepared by Leigh Prossor, with the assistance of Ben Johnson at the request of Norton Rose Fulbright to provide an independent assessment of the documents in accordance with the assessment criteria listed.

4 Information Used and Relied Upon

In responding to my instructions. I have relied primarily on;

- > The Northern and Western Geelong Growth Areas Framework Plan issued by the City of Greater Geelong in March 2019.
- > The Western Geelong Growth Area flood impact assessment and stormwater management strategy, Volume 1 Existing Conditions Report prepared by Water Technology and issued in January 2019.
- > The Western Geelong Growth Area Flood Impact Assessment and Stormwater Management Strategy, Volume 2 developed conditions, prepared by Water Technology and issued in May 2019.
- > The Northern and Western Geelong Growth Areas, Utility Servicing Strategy prepared by GHD and issued in May 2019.
- > The Northern and Western Growth Areas, Movement and Access Report, prepared by GTA Consultants.
- > Agenda, Ordinary Meeting of Council, Tuesday, 24 September 2019, Amendment C395 – Settlement Strategy & Northern and Western Geelong Growth Areas Framework Plan – Consideration of Submissions.
- > Greater Geelong Planning Scheme, Amendment C395 Part A Submission to the independent panel.

5 McCann Family Land - Fyansford

In July 2019 CardnoTGM prepared and issued two technical documents that were issued to Tract Consultants and were enclosed as appendices to the submission to the City of Greater Geelong Amendment C395 – Settlement Strategy and Northern and Western Geelong Growth Areas Framework Plan that was prepared by Tract Consultants on behalf of the McCann Family.

The first of these documents was titled the 'Western Geelong Growth Area Church Street Arterial Road Connection Options Analysis', a copy of this document is enclosed as Appendix A.

This report was largely prepared by Stephen Hundt who is a Senior Design Engineer with CardnoTGM. Stephen has some 21 years' experience as a Civil Engineer, working in a variety of projects and roles as a Designer, Manager and Senior Engineer. I oversaw, contributed to, reviewed and approved this report. I confirm that I adopt this report.

The second of these reports was titled 'Western Geelong Growth Area Servicing Advice for Proposed Residential Development', a copy of this report is enclosed as Appendix B.

This report was largely prepared by Ben Johnson who is a Project Manager with CardnoTGM and has some 22 years' experience in the civil engineering and land development industry as a civil draftsman, civil designer and project manager. I oversaw, contributed to, reviewed and approved this memorandum. I confirm that I adopt this earlier report.

6 Details of Changed Circumstances or Assumptions Since the Earlier Advice Prepared

Since the earlier documents were prepared and submitted, the Greater Geelong City Council has responded to the proposal by the McCann Family and others to shift the eastern boundary of the McCanns Lane Precinct eastwards. In the Council response as outlined in the Agenda, Ordinary Meeting of Council, Tuesday 24 September 2019, Amendment C395 – Settlement Strategy & Northern and Western Geelong Growth Areas Framework Plan – Consideration of Submissions. Council responded that they;

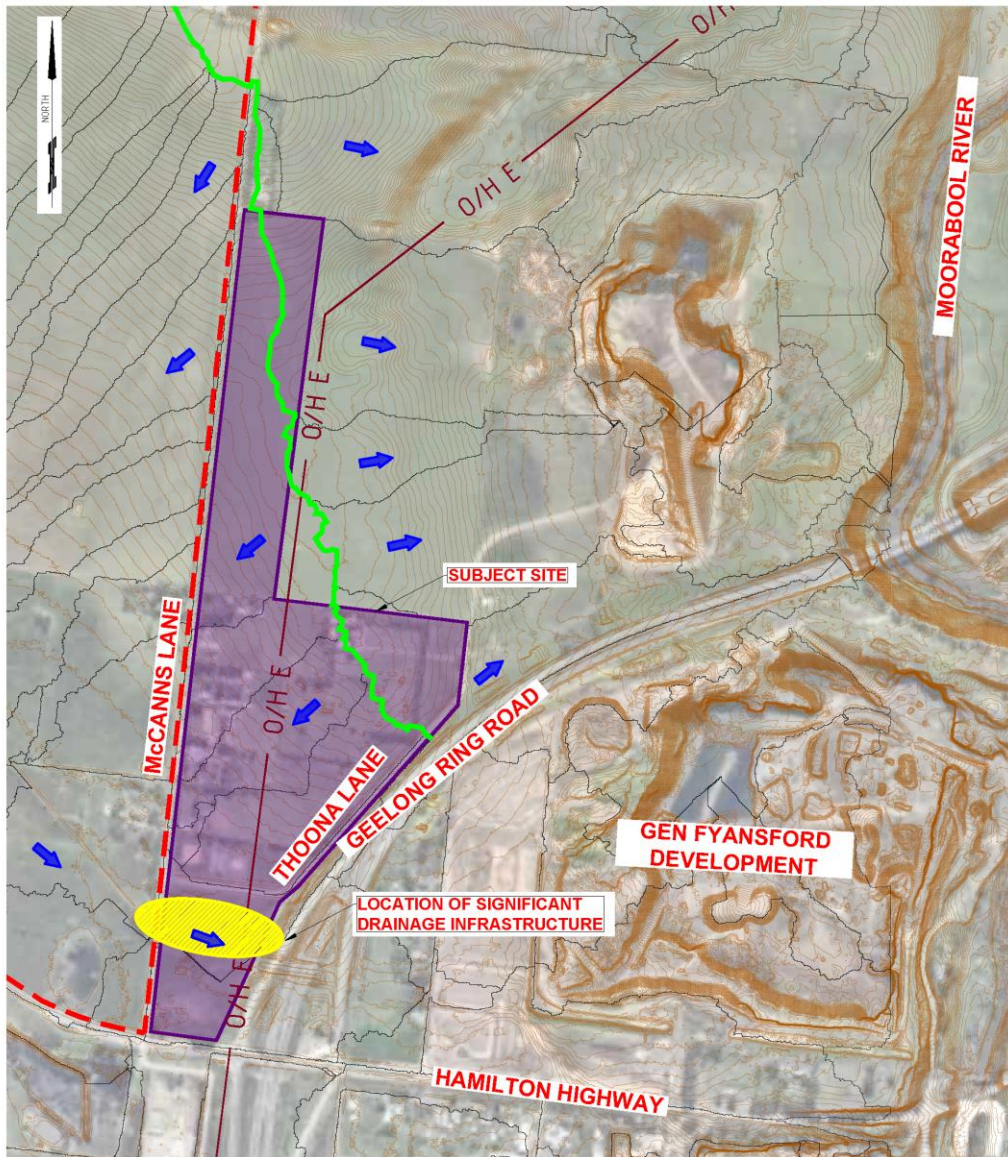
‘Supported in part. Boundary realignment will allow drainage outfall directly north of the Hamilton Highway and east of at McCanns Lane; however, the northern section of the land proposed for inclusion within McCanns Lane PSP may create stormwater drainage flows through neighbouring land in Batesford South PSP. Further investigation required.’

In the earlier McCann Family submission, three options were proposed outlining alternative scope of the proposed alteration to the area of the McCanns Lane Precinct. All three of these alternative options proposed to alter the boundary between the McCanns Lane precinct and the Batesford South Precinct in the vicinity of McCanns Lane, the Hamilton Hwy and the Geelong Ring Road by varying extents.

It is understood, that following further liaison with external stakeholders and discussion within their internal technical team of planners and engineers, that the McCann Family now propose to adopt a fourth proposal outlining the proposed extension of the McCanns Lane Precinct.

This fourth option is considered to be somewhat of a compromise or ‘midway option’ between the earlier options put forward. The Option 4 extent is outlined below in Figure 1.

Figure 1: Option 4 – McCanns Lane Precinct



- LEGEND:**
- PROPOSED AREA OF EXTENSION OF McCANN'S LANE PRECINCT
 - MAJOR CATCHMENT BOUNDARY
 - CONTOURS
 - CATCHMENTS
 - STORMWATER FLOWS
 - OVERHEAD TRANSMISSION LINES
 - CURRENT PRECINCT BOUNDARY

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ACCREDITED QUALITY ISO 9001:2015 (ENR) AND ISO 14001:2015 (ENR) CERTIFIED
 WESTERN GROWTH AREA, DESIGN/CONSTRUCTION WITNESS REPORT/DESIGN/CONSTRUCTION REPORT PROCESS REVIEW/ISSUE

**WESTERN GROWTH A
 SUBJECT SITE FIGURE**

OCTOBER 2019
 Rev. 01

The revised area in Option 4 has been amended to more closely reflect the existing major stormwater catchment boundaries and does not extend the new precinct boundary as far northwards or eastwards as the earlier options 1 and 3 proposed, however it does extend the boundary further than that proposed in the earlier option 2.

Accordingly, we have been instructed to consider the servicing implications in the slightly amended option 4 in the current statement.

The currently proposed precinct boundary running north south along McCanns Lane will result in the drainage outfall for the majority of the McCanns Lane precinct needing to cross a small segment of the Batesford South precinct prior to its outfall under the Geelong Ring Road. It is considered that this approach will increase the difficulty and uncertainties in the planning and delivery of the Batesford South Precinct. As noted above, in response to earlier submissions, Council has advised that subject to further investigation they are 'supportive in part' of amending this boundary.

The Water Technology Volume 2 report (developed conditions) identifies and acknowledges in section 6.2 that the currently proposed staging arrangements will lead to servicing difficulties that will '*likely require the construction of temporary drainage works*', at this exact location.

The proposed amended precinct extents as outlined in Option 4 (figure 1), if adopted will ensure that the proposed major drainage assets required to service the greater McCanns Lane precinct are located entirely within the McCanns Lane precinct and not within the Batesford South Precinct and eliminate this sequencing issue.

It is considered that this approach will significantly reduce the uncertainties and difficulties in delivering significant and essential assets required for the earlier sequencing McCanns Lane Precinct without detriment to later servicing Batesford South Precinct.

It is considered that the remaining services and access to the land can be provided as part of the development of the greater McCanns Lane precinct without significant implications to either the McCanns Lane precinct, or the Batesford South Precinct.

7 Conclusion

It is my opinion that all four of the options proposed by the McCann Family can be serviced if included in an expanded McCanns Lane precinct. Furthermore, if the revised precinct boundary proposed in option 4 is adopted, then all of the land can be serviced without any impacting on any of the required servicing arrangements currently required for the McCanns Lane precinct.

It is my opinion that;

- > The subject land outlined in Figure 1 can be serviced if included in the McCanns Lane precinct.
- > The inclusion of the subject land will be beneficial to the delivery of the drainage infrastructure required for the McCanns Lane precinct.
- > The amendment of the proposed precinct boundary to include the subject land in the McCanns Lane precinct will not adversely impact on the planning and delivery of the Batesford South precinct.

8 Declaration

I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.

Yours sincerely,

A handwritten signature in black ink, appearing to read "LGP".

Leigh Prossor
CardnoTGM
Manager – Civil Engineering

APPENDIX A – Western Geelong Growth Area Church Street Arterial Road Connection Options Analysis

Our Ref: 15410-99
Contact: Leigh Prossor

23 July 2019

Tract Consultants Pty Ltd
39 Gheringhap Street
GEELONG VIC 3220

TGM Group Pty Ltd
(a Cardno Company)

ABN 11 125 568 461

Level 1
27-31 Myers Street
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Att: Mr Nick Clements

Phone +61 3 5202 4600
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Dear Nick,

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WESTERN GEELONG GROWTH AREA CHURCH STREET ARTERIAL ROAD CONNECTION OPTIONS ANALYSIS

9 Background

CardnoTGM had previously been requested by Tract Consultants Pty Ltd to prepare a high-level concept design for potential options to connect Church Street to the Western Geelong Growth Area (WGGA) as indicated in the proposed framework plan for the area. The connection from the WGGA to Church Street is constrained by a number of significant factors, including the steep topography at the western end of Church Street, the freeway standard Geelong Ring Road (GRR) crossing the alignments, and the Moorabool River also bisecting the area. Adding to this is the requirement that the proposed route shall accommodate public transport (buses), which stipulate a maximum gradient of 9%, well below the natural terrain of the area. This letter provides a brief description of the 4 options assessed, and a more in-depth review of the two most suitable options, being the option matching the framework plan, and the most engineering efficient option.

The four options that were identified were:

OPTION 1 – Direct (straight) connection from Church Street, across the GRR, down the escarpment with large fill batters and then crossing the Moorabool River.

OPTION 2 – Provision of a 900m tunnel from approximately Vines Rd to the western side of the GRR to avoid the steep terrain (running at maximum tunnel grade 5%), then deviating north to allow for a more favourable Moorabool River crossing.

OPTION 3 – Alignment sweeping south-westerly from the end of Church Street to run parallel with the GRR alignment, taking advantage of the existing earthworks on the common boundary between the two roads. Then turning north west to cross the Moorabool River upstream of the GRR bridge crossing.

OPTION 4 – Alignment sweeping to the north-west from Church Street, crossing the existing escarpment batter at an angle to provide for maximum bus grades. Then turning south west to cross the Moorabool River in a more favourable location.

Following on from early review of the options, Option 2 was discarded due to the extremely high construction costs associated with tunnelling and the impact of the tunnel entrance at the eastern end on existing houses and environment, and Option 3 was discarded due to the costs associated with a long curved bridge required to serve this option over the GRR and the extensive impact on the adjoining properties.

10 Preferred Option

Following the initial review of the options, further work was undertaken in the refinement of the two remaining options (Option 1 & 4) to provide for a more detailed understanding of the engineering issues with their construction and an indication of construction costs was able to be obtained.

Based on this further refinement, the option that most suited the existing terrain, without providing large impediment to the usage of land in the WGGGA, and with lower construction costs was identified to be Option 4. Therefore, we have recommended that Option 4 is the preferred option for the Church Street connection link.

11 Further Discussion Points

Further to additional refinements that could occur with the option(s) proposed, we note that just prior to the western ends of both Options 1 and 4, both road alignments are crossed by the existing 220kV extra high voltage transmission lines that run from the Geelong Terminal Station in Anakie Road around the periphery of the Geelong urban area to Point Henry (former ALCOA smelter). These lines in their current location will form a significant constraint on the land use and the road network layout for the immediate area of the WGGGA. It is recommended that consideration be given to the relocation / undergrounding of these lines. Discussions will need to be held with the asset owner (Ausnet Services) as to the suitability for the undergrounding or realigning of these transmission lines.

These lines formerly served the now closed Alcoa Aluminium smelter at Point Henry, there may no longer be a need for these transmission lines at all. This would also need to be confirmed or otherwise with the asset owner.

Given the above, it is considered that flexibility be maintained in the framework plan to revert the current transmission easement to developable land.

Yours sincerely,
CardnoTGM



Leigh Prossor
Manager – Civil Engineering

APPENDIX A



Figure 1: Preferred Options – With Framwork plan underlaid

APPENDIX B

OPTION 1 – Direct (westerly) link from Church Street to Western Geelong Growth Area

Description

Option 1 of the Church Street connection alignments from the Western Geelong Growth Area (WGGA) to the existing road reserve at the western end of Church Street most closely follows the framework plan. A 82m long bridge crosses the Geelong Ring Road, before the connection runs along a high (up to 25m high) batter between the escarpment and the Moorabool River. A 239m long bridge then provides for the connection across the Moorabool River.

Estimated Construction Cost:

\$80M inclusive of Construction, Consultants, Fees, Contingencies and GST

Advantages

- Meets the requirements of the Framework plan and most closely follows the alignment;
- Has the shortest length bridge across the Geelong Ring Road;
- Provides the most conventional entry/ exit ramp connections to the Geelong Ring Road if required, either as part of the WGGA works, or at a later date.
- Provides for a standard T-intersection for the Church Street connection and the newly constructed Heights Estate entry road - Monier Way.

Disadvantages

- Requires the longest bridge over the Moorabool River as the road alignment crosses on a diagonal where the existing flood plain is wider. The associated construction cost is therefore significantly higher than Option 4.
- Extremely high earthen embankment (up to 25m high, typically 20m high) due to the existing topography falling away from Church Street steeper than the maximum allowable grade for a bus route (9%). This high embankment then creates a 230m wide (at the base, based on 1 in 5 slopes) barrier separating the northern side of the connector road from the south;
- The impact of the high embankment creates a visually intrusive barrier within the WGGA and the Moorabool River floodplain, and notably when viewed from the Geelong Ring Road.
- The steep deck grade of the bridge over the Geelong Ring Road (5%) may require additional abutment works/ costs compared to flatter bridge deck grades.
- Has a significantly higher estimated construction cost than Option 4, especially in the bridge construction costs (40% higher due to additional length) which is likely to contain the most uncertainty in costs at this point in time.

OPTION 4 – North-westerly connection link running across the existing escarpment batter from Church Street to Western Geelong Growth Area

Description

Option 4 makes use of running across the existing escarpment batter to allow the road to achieve the maximum bus route grades whilst also minimising the creation of large embankments. A 121m long bridge conveys traffic over the Geelong Ring Road, then running down the batter slope to the toe of the existing slope, then turning south-west to head across the Moorabool River via a 106m long bridge at a favourable location

Estimated Construction Cost:

\$50M inclusive of Construction, Consultants, Fees, Contingencies and GST

Advantages

- Meets the requirements of the Framework plan and ultimately joins back onto the framework alignment;
- Has the shortest length bridge across the Moorabool River due to locating the crossing at a more favourable point along the river and where the topography suits the bridge abutments better than Option 1;
- The proposed bridge deck longitudinal grades are typically less than 2.4%, therefore more likely to require less abutment foundation works compared to Option 1.
- Provides entry/ exit ramp connections to the Geelong Ring Road if required, either as part of the WGGGA works, or at a later date.
- Provides for an intersection for the Church Street connection and the newly constructed Heights Estate entry road - Monier Way.
- Has no large earthen embankments. The large cut batter required runs at basically the same grade as existing, and can be re-vegetated to marry into the existing topography to minimise visual intrusion once vegetation establishment has occurred.
- Provides the cheaper estimated construction cost, with the reduced cost of Bridge construction and earthworks compared to Option 1 more than offsetting the increased length of road (and associated works).
- Provides a road that is generally in vertical alignment with the existing surface levels on the east side of the river, this will facilitate connection to the proposed adjoining development at this location.

Disadvantages

- The entry/ exit ramps from the Geelong Ring Road if required vary from conventional ramps and may require additional requirements to achieve VicRoads acceptance prior to design compared to Option 1. We note either option would require VicRoads approval early in the planning process.
- A larger degree of re-work of the intersection with the new Monier Way (Heights Estate) connection would be required compared to Option 1
- Has a longer bridge across the Geelong Ring Road, therefore construction costs of this bridge are higher than Option 1.
- The length of road is increased compared to Option 1 in order to achieve the bus grade requirements without needing large fill embankments.

APPENDIX B – Western Geelong Growth Area Servicing Advice for Proposed Residential Development

Our Ref: 15410-99
Contact: Leigh Prossor

23 July 2019

Tract Consultants Pty Ltd
39 Gheringhap Street
GEELONG VIC 3220

Att: Mr Nick Clements

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Dear Nick,

WESTERN GEELONG GROWTH AREA SERVICING AND CONSTRUCTION ADVISE FOR PROPOSED RESIDENTIAL DEVELOPMENT

1. Purpose

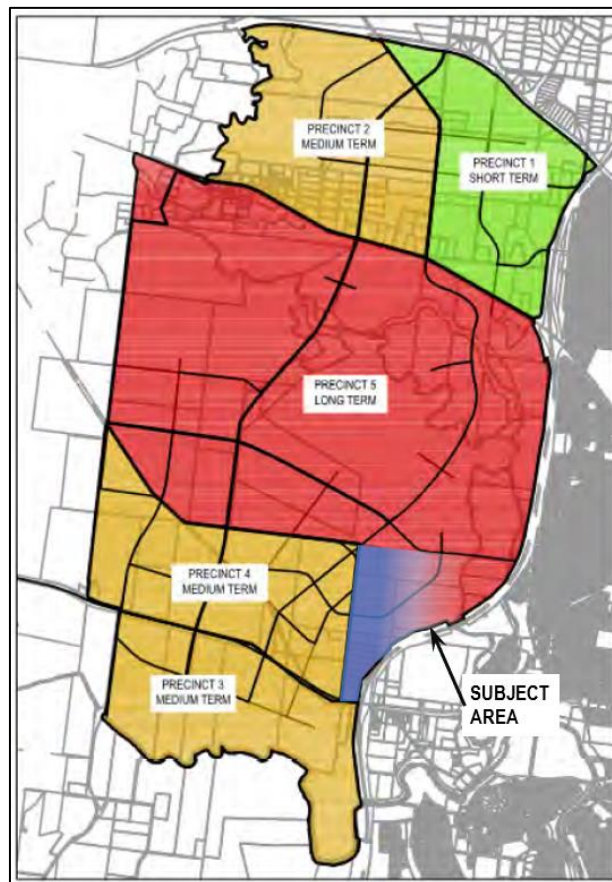
The purpose of this memorandum is to provide a high-level servicing strategy for the land, to the east of the McCanns Lane precinct and south of a projection of Church Street extending towards the Geelong Ring Road, to be transitioned to allow a residential development of the site. We understand that the McCann family wish to include the subject area within the McCanns Lane precinct in order to improve its ability to be serviced in a timely manner.

2. Background

The subject area is located within the south eastern corner of the Batesford South Precinct (Precinct 5) of the City of Greater Geelong's Western Geelong Growth Area (WGGA). The subject area is triangular in shape to the east of McCanns Lane extending to the Geelong Ring Road to the south and towards the Geelong Ring Road / Barwon River to the north, refer *Figure 2-1: Proposed WGGA Sequencing Diagram*.

The area is currently rural farmland similar to the land to the west and north which is included within the WGGA. The southern section contains several smaller rural residential landholdings.

Figure 2-1: Proposed WGGGA Sequencing Diagram



3. Servicing Strategy

A utility servicing strategy has previously been undertaken for the City of Greater Geelong which encompasses the Northern and Western Geelong Growth Areas (GHD – Report for City of Greater Geelong – North and West Geelong Growth Area Service Report, 3136336, May 2019). As mentioned previously the subject area is located within the south eastern corner of the Batesford South Precinct of the WGGGA.

Refer to Appendix A for GHD’s WGGGA Proposed Trunk Servicing (Indicative) Plan.

3.1 Drainage

A Western Geelong Growth Area Flood Impact Assessment and Stormwater Management Strategy, Volume 2: Developed Conditions Report (May 2019) has been undertaken by Water Technology for the City of Greater Geelong which outlines the drainage strategy for the WGGGA.

The subject area along with neighbouring properties to the west predominately fall to the eastern side of the area toward the Moorabool River in the norther section and existing culverts under the Geelong Ring Road for the south. The Water Technologies report nominates for area to the west, Precinct 4, to drain to two proposed basins located within the subject area with a drainage outfall pipe connecting to the river, one to the south and the other northwards.

The report identifies that several drainage catchments within the currently proposed precinct 4 have drainage assets and outfalls located to the east of McCanns Lane including the subject area.

It is considered that this southern outfall will have minimal impact and footprint within the Moorabool River environment and that, subject to all required approvals and permits being in place, this pipe could be

provided in isolation from the overall strategy and the overall river precinct works. The northern basin, whilst located on the subject area with the outfall towards the north serves both the subject area and a portion of Precinct 4.

It is considered that this approach of requiring significant infrastructure outside the precinct it will serve will likely result in difficulties in delivering significant and essential assets required for an earlier sequenced precinct 4. It is recommended that moving the precinct boundary for precinct 4 further east towards the Geelong Ring Road will eliminate this problem.

3.2 Sewer

The Barwon Water Servicing Strategy identifies an interim and ultimate strategy for the development of the WGGA. The interim strategy requires two pump stations (BSPS1 & 2) to be constructed in the south east corner of the WGGA with a 6.7km outfall connection back to a transfer pump station constructed in Precinct 1. The ultimate strategy requires the outfall to be connected to the south via a 14.5km pipe and 3 transfer pump stations to Barwon Water Main Outfall Sewer (MOS).

Precinct 3 & 4 interim sewer works will require a pump station (BSPS2) to be constructed along Hamilton Highway connecting to a second pump station (BSPS1) located in the subject area using the Geelong Ring Road corridor and private property converted to reserves. The outfall will connect to the north via the Geelong Ring Road corridor.

The Precinct 3 & 4 pump station requirements will allow for a small section north of the Hamilton Highway and just west of the Geelong Ring Road to be serviceable. The subject area could be fully serviced with the construction of the pump station BSPS1 and interim / ultimate outfalls and has the potential to be developed early on as infrastructure and access will be present. It is noted that portions of the current Precinct 3 & 4 cannot be serviced without the sewer pump station (BSPS1) on this area. This approach will result in significant works located in the current Precinct 5 footprint being required to be delivered to service Precincts 3 & 4.

It is considered that this approach will likely result in difficulties in delivering significant and essential assets required for an earlier sequencing precinct. It is recommended that moving the precinct boundary for precinct 4 further east towards the Geelong Ring Road will eliminate this problem.

3.3 Water

Previous precinct 3 / 4 works will require a Pressure Reducing Valve (PRV) is to be placed on the existing She Oaks – Montpellier Transfer Main around the existing Hamilton Highway / McCanns Road intersection with water main extension into these precincts. The subject area can connect into this PRV and water mains via existing road networks or proposed road / reserves on neighbouring development as it occurs.

3.4 Electricity

Powercor highlighted in its servicing strategy a number of upgrades that will be required to their existing network relevant to supply to the WGGA in an interim and full development capacity.

Electricity distribution for development of the subject area can occur with the Powercor upgrades. The electrical network can be supplied via underground cables located in existing / proposed road reserves and easements and the establishment of new kiosk substations.

3.5 Telecommunications

NBN have advised that telecommunications infrastructure in the WGGA will be deployed using fibre to the node infrastructure with fibre access nodes (FAN) to be located within the WGGA. The telecommunications network can be supplied via underground cable located in existing / proposed road reserves and easements.

3.6 Gas

Gas infrastructure is not an essential service but AusNet have advised that gas would be made available on a connection-by-connection basis as required.

3.7 Access

Access to the subject area can be made from the existing road reserves primarily from McCanns Road or through the development of surrounding properties as they connect.

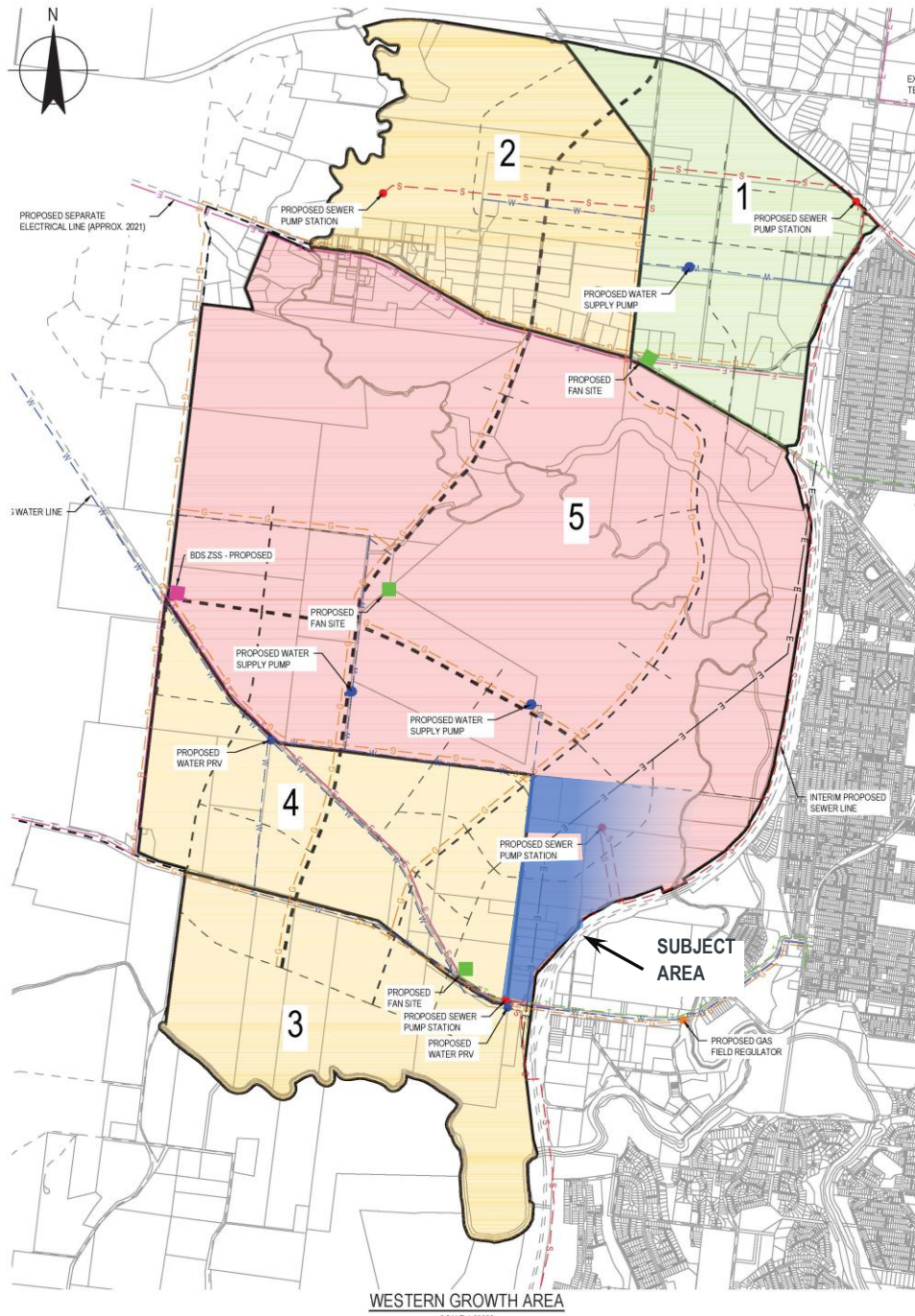
If you have any queries or wish to further discuss the proposal please don't hesitate to contact Leigh Prossor on (03) 5202 4600.

Yours sincerely,
CardnoTGM

A handwritten signature in black ink, appearing to read "Leigh P", written in a cursive style.

Leigh Prossor
Manager – Civil Engineering

Appendix A – GHD WGGGA Proposed Trunk Servicing (Indicative) Plan



LEGEND

	PROPOSED PRECINCT BOUNDARY		PROPOSED SEWER PUMP STATION
	PROPOSED ROAD NETWORK		PROPOSED WATER SUPPLY PUMP
	EXISTING PROPERTIES		PROPOSED ELECTRICAL ASSET
	PROPOSED GAS		PROPOSED FAN SITE
	PROPOSED ELECTRICAL		PROPOSED FIELD REGULATOR
	PROPOSED TELECOMMUNICATION		SHORT TERM PRECINCT
	PROPOSED WATER		MEDIUM TERM PRECINCT
	PROPOSED SEWER		LONG TERM PRECINCT
	EXISTING APA GAS MAIN		
	EXISTING HIGH VOLTAGE ELECTRICAL		

NOTES:

1. THIS PLAN SHOWS A POTENTIAL INDICATIVE GAS NETWORK, AS PART OF ENVIRONMENTALLY SUSTAINABLE DESIGN OPPORTUNITIES IN THE DETAILED DESIGN STAGE. CoGG ARE INVESTIGATING WHETHER GAS WILL BE PROVIDED. REFER TO SECTION 3.4 OF NWGGA UTILITY SERVICING STRATEGY FOR FURTHER DISCUSSION.
2. REFER TO APPENDIX B FOR SEWER/WATER AUGMENTATION WORKS.
3. SERVICE ALIGNMENTS SUBJECT TO CHANGE UPON DETAILED DESIGN OF SERVICES, SEQUENCING OF STAGES AND ALIGNMENTS OF ROADS.
4. MOBILE TELECOMS TOWERS NOT SHOWN.