

7.12 North East Link: Update

Abstract

This report seeks Council endorsement of a Boroondara submission on the North East Link Authority (NELA) *Environment Protection and Biodiversity Conservation Act 1999* (EPBC or the Act) referral. It also updates Council on recent activities relating to the North East Link (NEL) project.

On 18 January 2018 the NELA referral to the EPBC was published on the Federal Department of the Environment and Energy (DoEE) website. The referral was prepared in accordance with DoEE guidelines and was triggered by:

- Works on Commonwealth land, being the Simpson Barracks, and
- Works likely to impact an EPBC listed species, being the Matted Flax-lily.

The referral was published as an invitation for public comment and provided 10 business days in which to prepare and submit a report detailing whether, and how, the proposal would have a significant impact on matters protected by the EPBC Act.

Accordingly, Council officers prepared and submitted a report to the DoEE on behalf of Council (**Attachment 1**). The report had input from experts in the fields of ecology, hydrology and hydrogeology. The report was submitted by email to the DoEE on Tuesday 6 February 2018 following the receipt of a three business day extension, and was copied to the Minister for the Environment and Energy.

The report submitted to the DoEE in accordance with the EPBC referral guidelines is now presented to Council for endorsement. The submission raises a number of concerns about the EPBC Act referral and requests the Minister for the Environment and Energy to ensure the most rigorous environmental assessment of the project is undertaken.

Since last updating Council on the NEL project, officers have been provided with some further information about the proposed design of the Eastern Freeway, including:

- Collector - Distributor design to physically separate NEL-bound and citybound traffic from Tram Road to Bulleen Road.
- Fully managed motorway operations, including overhead speed control for each lane and no dedicated emergency lanes.
- Widening of the Eastern Freeway from Chandler Highway to Springvale Road of between one and four lanes in each direction.

The following indicative traffic volume changes have also been advised by NELA:

- Generally, there is a 1-3% decrease in traffic volumes on east-west roads and a 1-3% increase in traffic volumes on north-south roads in Boroondara.
- Modelling indicates an 8-10% increase in traffic volumes on Bulleen Road south of the Eastern Freeway.

Council resolved on 27 November 2017 to write to local Members of Parliament, to the leaders of the Victorian Liberal and Greens parties and the leaders of all other non-government political parties represented in the State Parliament. The letters sought support of Council's position that Option C best achieves the NEL project objectives. Of the replies received, the responses ranged from opposition to the project and four corridor options (the Victorian Greens) to advice noting the project and alignments are being considered with no preferred corridor at this stage (Victorian Liberal Party).

In late 2017 Council wrote to the Victorian Information Commissioner to appeal NELA's decision to not release any documents in response to Council's request for information about the NEL project under Freedom of Information provisions. Council has also written to the Victorian Ombudsman regarding the process undertaken by NELA relating to the NEL project. Officers understand both agencies are in the process of considering these requests.

Officers' recommendation

That Council resolve to:

1. Note this report and update regarding the North East Link project.
2. Endorse the North East Link Authority *Environment Protection and Biodiversity Conservation Act 1999* referral submission as included in Attachment 1.
3. Write to the Department of the Environment and Energy to advise of Council's endorsement of the submission.
4. Write to the Minister for the Environment and Energy, the Hon Josh Frydenberg MP, requesting a meeting to discuss Council's concerns with the NEL project and the EPBC Act referral.

**Responsible director: Bruce Dobson
Environment & Infrastructure**

1. Purpose

The purposes of this report are to provide Council with:

- The North East Link Authority (NELA) Environment Protection and Biodiversity Conservation Act 1999 referral submission prepared by Council officers and to seek endorsement of the submission.
- An update on advice received from NELA regarding the Eastern Freeway works and traffic volume changes associated with the North East Link.
- An update on Council's requests of the Victorian Information Commissioner and Victorian Ombudsman regarding the North East Link.
- An update on the feedback received from Members of the Victorian Parliament in response to Council's letters sent in accordance with the 27 November 2017 Ordinary Council meeting resolution.

2. Policy implications and relevance to council plan

This report is consistent with the following items as defined in the Council Plan 2017-21:

Theme: Enhanced amenity

Strategic objective: Facilitate the process of urban renewal throughout the City to enhance amenity by efficient and effective permit issuing administration.

Strategy 11: Parking, traffic and transport - Respond effectively and efficiently to community needs on parking, traffic and appropriate transport issues.

Strategy 12: Safety and amenity - Implement appropriate policies, strategies and practices that will improve neighbourhood amenity and safety.

3. Background

3.1 Environment Protection and Biodiversity Conservation Act

On 18 January 2018 the North East Link Authority (NELA) referral to the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC or the Act) was published on the Federal Department of the Environment and Energy (DoEE) website.

The referral was prepared in accordance with DoEE guidelines and was triggered by:

- Works on Commonwealth land, being the Simpson Barracks, and
- Works likely to impact an EPBC listed species, being the Matted Flax-lily.

The referral considers matters of national environmental significance (MNES) in accordance with the EPBC. The EPBC is very prescriptive in terms of what constitutes a MNES, with the two items listed above included in the definition of a MNES.

The Minister has 20 business days to consider the referral and submissions made to then decide if the action being sought by the referral, in this case the delivery of the NEL, is a 'controlled action' and from there the assessment process to be used. The action can be determined to be a controlled action, not a controlled action 'particular manner', or not a controlled action.

If the action is determined to be a controlled action there are six pathways of assessment available, including the Victorian Environmental Effects Statement (EES), the Federal Environmental Impact Statement (EIS) and Federal Public Inquiry (PI).

In considering the EPBC Act referral, the Minister, or their delegate, can only take into account comments, concerns or issues in respect to the specific matters of national environmental significance or matters protected under the EPBC Act.

The referral was published as an invitation for public comment. The public, including Council, had 10 business days in which to prepare and submit a report detailing whether, and how, the proposal would have a significant impact on matters protected by the EPBC Act. Council officers successfully applied for an extension to the submission deadline, with three extra business days provided by the DoEE.

3.2 Design and traffic volume information

Council has repeatedly sought information from NELA on the project design and expected traffic volume changes.

Since officers last updated Council on the NEL project, NELA officers have now provided some design information for the Eastern Freeway upgrade works and expected traffic volume changes. Details are included in section 4 of this report.

3.3 FOI application and Ombudsman request

On 27 November 2017 Council wrote to the Victorian Information Commissioner to appeal NELA's decision to not release any documents in response to Council's request for information about the NEL project under Freedom of Information provisions. Council has also written to the Victorian Ombudsman on 10 November 2017 regarding the process undertaken by NELA relating to the NEL project.

3.4 Correspondence with from Victorian MP's

Following its resolution on 27 November 2017, Council wrote to local Members of Parliament, to the leaders of the Victorian Liberal and Greens parties and the leaders of all other non-government political parties represented in the State Parliament. The letters sought support of Council's position that Option C best achieves the NEL project objectives.

4. Outline of key issues/options

4.1 Environment Protection and Biodiversity Conservation Act

Given the very short timeframe provided by the DoEE in which to provide a submission, officers prepared and submitted a report on behalf of Council. See **Attachment 1** for the report as submitted to the DoEE. The report had input from experts in the fields of ecology, hydrology and hydrogeology, and all with previous EPBC referral experience. Information was sought from Maddocks, Council's lawyers, about the referral and submission.

In summary, the submission expresses serious concerns about NELA's EPBC Act referral, including:

- Limited demonstrated understanding of EPBC listed species under threat by the NEL.
- The substantial risk posed by NEL to the habitat of the River Swamp Wallaby-grass (*Amphibromus fluitans*), an EPBC listed species.
- The referral lacks sufficient detail in order to accurately assess the EPBC impacts of the proposed activities.
- The referral contains a number of inaccuracies and inconsistencies as well as making assumptions which are not supported by available evidence.

The report, being Council's submission to the NELA EPBC Act referral, is now presented to Council for endorsement. The Hon. Josh Frydenberg, MP is the Minister for the Environment and the relevant Minister for the EPBC Act. The submission requests the Minister consider and determine the proposed action to be a controlled action and ensures the most rigorous environmental assessment of the controlled action is undertaken by means of a Public Inquiry.

Officers also recommend Council seek a meeting with the Minister to discuss Council's concerns with the NEL project and the EPBC Act referral.

4.2 Design and traffic volume information

The following information has been provided by NELA to Council officers.

4.2.1 Whole of the Eastern Freeway

- Collector - Distributor (C-D) style arrangement for NEL-bound traffic: Similar to the Bell Street off-ramp from the Tullamarine Freeway, with NEL-bound and city-bound traffic physically separated.
- Motorists will be required to make a decision about their destination, NEL or the city, at Tram Road. From Tram Road to Bulleen Road the NEL-bound and city-bound traffic is physically separated.
- The Eastern Freeway and NEL will be fully managed motorways with Intelligent Transport Systems (ITS) integrated with the upgrade works. Items of note include no emergency lanes, dynamic speed control in each lane and ramp metering on all on-ramps.

4.2.2 Widening works

- Chandler Highway to Burke Road: One additional lane in each direction within the freeway reservation.
- Burke Road to Bulleen Road: Two additional lanes in each direction within the freeway reservation.
- Bulleen Road to Tram Road: Up to four additional lanes in each direction.
- Tram Road to Springvale Road: Up to two additional lanes in each direction.

4.2.3 Traffic volumes

The impact of the NEL on traffic volumes is generally experienced from north of Whitehorse Road. NELA has advised its modelling shows negligible impact on roads south of Whitehorse Road.

- Generally, there is a 1-3% decrease in traffic volumes on east-west roads and a 1-3% increase in traffic volumes on north-south roads in Boroondara.
- Modelling indicates an 8-10% increase in traffic volumes on Bulleen Road south of the Eastern Freeway.

4.3 FOI application and Ombudsman request

On 27 November 2017 Council wrote to the Victorian Information Commissioner to appeal NELA's decision to not release any documents in response to Council's request for information about the NEL project under Freedom of Information provisions.

Following enquiries made of NELA from the Victorian Information Commissioner, NELA on 19 December 2017 wrote to Council advising it had revoked its original FOI decision and made a Fresh Decision under the Freedom of Information Act 1982. The Fresh Decision maintained the documents sought were exempt under the Act, however given the breadth of the request, NELA also advised it would be very likely that the work involved in processing the request would substantially and unreasonably divert the resources of NELA from its other operations.

On 12 January 2018 Council again wrote to the Victorian Information Commissioner appealing the fresh decision made by NELA refusing Council access to any of the documents requested. Officers are currently awaiting a response from the Victorian Information Commissioner regarding this appeal.

Council also wrote to the Victorian Ombudsman on 10 November 2017 regarding the process undertaken by NELA relating to the NEL project. Further information was requested by a senior investigator from the Victorian Ombudsman's office and was provided by Council officers on 19 January 2018. Council was advised on 14 February 2017 the Ombudsman's office is continuing to make enquires with NELA regarding the complaint and Council would be contacted in due course regarding the outcome of its request.

4.4 Responses from Victorian MP's

As noted, Council wrote to local Members of Parliament, the leaders of the Victorian Liberal and Greens parties and the leaders of all other non-government political parties represented in the State Parliament seeking their support for option C as the preferred corridor option and asking them to clearly advise Council which of the four corridor options they support.

The following is a summary of responses received:

- *David Hodgett, MP, Deputy Leader of the Opposition, Shadow Minister for Roads and Infrastructure*

The Coalition will continue to assess the stakeholder feedback and advocate to make sure the project is right and will continue to develop its position over the coming months as we move closer to the November Victorian election.

- *The Hon. Bruce Atkinson, MLC*

Council's concerns were noted and to be discussed with colleagues.

- *The Hon. Peter Walsh MP, Leader of the Nationals*

Noted Council's correspondence and did not offer comment on the project.

- *Samantha Dunn, MLC, Greens spokesperson on the North East Link*

The Greens oppose the project and all four corridor options presented.

- *Fiona Patten, MLC, Reason Party*

The Reason Party noted their support for corridor Option A.

Copies of the responses are included in **Attachment 2**.

5. Consultation/communication

Extensive consultation was conducted with Council departments for the development of Council's submission to the EPBC Act referral.

Council officers shared information and advice from experts with peers from Banyule Council and Manningham Council, also impacted significantly by the NEL project.

6. Financial and resource implications

The EPBC Act referral submission was prepared by Council officers with the assistance of external experts funded within Council's operating budget.

7. Governance issues

Under Section 80C of the Local Government Act 1989, no officer involved in the preparation of this report has any direct or indirect interest in the subject matter of the report.

Consistent with the Charter of Human Rights and Responsibilities Act 2006, it is considered that no human rights are impacted or infringed as a consequence of the recommendation of this report.

8. Social and environmental issues

Council has serious concerns about the NEL including the social and environmental impact the project may have on the Boroondara and wider community.

The EPBC Act referral submission detail specific concerns related to EPBC matters.

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|------------------------|---|
| Manager: | Jim Hondrakis, Traffic &Transport |
| Report officer: | Clare Davey, Coordinator Transport Management |

6 February 2018



By email: epbc.referrals@environment.gov.au

Dear Sir/Madam

Reference number: 2018/8142

Title of Referral: DEPARTMENT OF ECONOMIC DEVELOPMENT JOBS TRANSPORT AND RESOURCES/Transport - Land/The lot numbers and titles would be determined based on the final detailed design./Victoria/North East Link Project, Vic

Thank you for the opportunity to formally respond to the North East Link Authority's (NELA) *Environment Protection and Biodiversity Conservation Act 1999* (EPBC or the Act) referral for the North East Link (NEL) project (reference number 2018/8142).

In its submission of September 2017 to NELA about the NEL project, Council strongly opposed the NEL corridor Option A. Should the NEL proceed, Boroondara prefers corridor Option C as it is considered to best meet the broader objectives of the NEL project.

We offer the attached submission in our desire to be an active and constructive participant in the planning of the NEL and in representing our community. Council acknowledges the extension granted by the Department of Environment and Energy to allow Council to provide this information by 6 February 2018.

Boroondara holds serious concerns about NELA's EPBC Act referral, including:

- Limited demonstrated understanding of EPBC listed species under threat by the NEL.
- The substantial risk posed by NEL to the habitat of the River Swamp Wallaby-grass (*Amphibromus fluitans*), an EPBC listed species.
- The referral lacks sufficient detail in order to accurately assess the EPBC impacts of the proposed activities.

- The referral contains a number of inaccuracies and inconsistencies as well as making assumptions which are not supported by available evidence.

We request the Minister consider and determine the proposed action to be a controlled action.

We request the Minister ensure the most rigorous environmental assessment of the controlled action is conducted by means of a Public Inquiry.

We note an Environment Effects Statement (EES) is currently being prepared under the Victorian *Environment Effects Act 1978*. Council acknowledges that this process may constitute a suitable accredited assessment process for the purposes of assessing impacts on MNES that may be caused by the NEL.

We do not believe assessment by way of an Environmental Impact Statement (EIS) or Public Environment Report (PER) is appropriate as these processes do not require public hearings to be held and are therefore less transparent.

Should you have any further queries regarding this matter please contact me on 9278 4500.

Yours sincerely



Bruce Dobson
Acting Chief Executive Officer

cc: The Hon. Josh Frydenberg, MP

Submission to North East Link Authority Referral

Referral 2018/8142 under Part 3 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth)

Submitted by: City of Boroondara

Date: 6 February 2018

Table of Contents

| | |
|---|----|
| Executive summary | 1 |
| 1. Introduction | 3 |
| 2. Site context | 3 |
| 3. EPBC related concerns, issues and omissions..... | 5 |
| 3.1 Ecology | 5 |
| 3.1.1 River Swamp Wallaby-grass (<i>Amphibromus fluitans</i>) | 5 |
| 3.1.2 Matted Flax-lily (<i>Dianella amoena</i>) | 7 |
| 3.2 Hydrology | 7 |
| 3.3 Hydrogeology | 8 |
| 4. Conclusions | 10 |
| 5. 'The Ask' | 11 |
| 6. Council contact details..... | 11 |
| Appendix A - Ecology report..... | |
| Appendix B - Hydrology report | |
| Appendix C - Hydrogeology report | |

Executive summary

Thank you for the opportunity to formally respond to the North East Link Authority's (NELA) *Environment Protection and Biodiversity Conservation Act 1999* (EPBC or the Act) referral for the North East Link (NEL) project.

In its submission of September 2017 to NELA about the NEL project, Council strongly opposed the NEL corridor Option A. Should the NEL proceed, Boroondara prefers corridor Option C as it is considered to best meet the broader objectives of the NEL project.

Boroondara is located at the southern end of the referred project area and is likely to be impacted by the proposed:

- Interchange of Bulleen Road, NEL and the Eastern Freeway.
- Widening and other works on the Eastern Freeway.
- Tunnel portal noted as being south of the Veneto Club.

A peer review by industry experts of the ecology, hydrology and hydrogeology information provided in the NELA EPBC Act referral documentation has been completed on behalf of Boroondara.

Council notes the NELA referral accepts the proposal could have a significant impact on matters of national environmental significance (MNES). In this context the focus of this submission concerns the conceptual nature of the proposal information at this early stage.

Council received unanimous advice from the industry experts that as the NELA referral is based on concept plans (as acknowledged by NELA) the EPBC Act referral lacks sufficient detail in order to accurately assess the EPBC impacts of the proposed activities. Further, the referral contains a number of inaccuracies and inconsistencies as well as making assumptions which are not supported by available evidence.

As further technical assessments and design development will be carried out over time, Council considers there are likely to be other potentially relevant impacts on MNES that require assessment in future. Reliance on preliminary information at this stage may mean the controlling provisions will need to be reconsidered as more information comes to hand.

It is considered appropriate and important the Minister for the Environment and Energy:

- Consider the delivery of NEL as and to be a controlled action.
- Determine the delivery of NEL as and to be a controlled action.
- Ensure the most rigorous environmental assessment of the controlled action is conducted by means of a Public Inquiry.

We note an Environment Effects Statement (EES) is currently being prepared under the Victorian *Environment Effects Act 1978*. Council acknowledges this process may constitute a suitable accredited assessment process for the purposes of assessing impacts on MNES that may be impacted by the NEL.

We do not believe assessment by way of an Environmental Impact Statement (EIS) or Public Environment Report (PER) is appropriate as these processes do not require public hearings to be held and are therefore less transparent.

1. Introduction

Thank you for the opportunity to formally respond to the North East Link Authority's (NELA) *Environment Protection and Biodiversity Conservation Act 1999* (EPBC or the Act) referral for the North East Link (NEL) project.

The City of Boroondara (Boroondara or Council) recognises the need to respond to Melbourne's transport network needs and values the work of Infrastructure Victoria in planning for these needs, noting the NEL was listed as a priority project for Victoria.

In its submission of September 2017 to NELA about the NEL project, Council strongly opposed the NEL corridor Option A. Should the NEL proceed, Boroondara prefers corridor Option C as it is considered to best meet the broader objectives of the NEL project.

We offer our comments and requests in our desire to be an active and constructive participant in the planning of the NEL and in representing our community.

This submission and its appendices detail Council's concerns about the NEL EPBC referral for areas within and outside of the municipality. This approach recognises environmental significance and impacts on these areas do not stop at municipal borders, with upstream and downstream impacts highly likely.

Council also acknowledges the extension granted by the Department of Environment and Energy to allow Council to provide this submission by 6 February 2018.

Given the short timeframes, this submission has been prepared by Council officers and has not been formally endorsed by Council at the date of submission.

2. Site context

Boroondara is located at the southern end of Bulleen Road, with the Yarra River, Koonung Creek and Eastern Freeway generally forming the northern border of the municipality. The Cities of Banyule and Manningham are to the north, the City of Whitehorse to the east and the City of Yarra to the west.

Within the context of the NEL and the referred project area, as defined by *Attachment G - Project area report* of the EPBC Act referral, Boroondara is most significantly impacted by the proposed:

- Interchange of Bulleen Road, NEL and the Eastern Freeway.
- Widening and other works on the Eastern Freeway.
- Tunnel portal noted as being south of the Veneto Club.

The Boroondara owned Freeway Golf Course (FGC) and Boroondara Tennis Centre (BTC), both immediately north of the Eastern Freeway at its interchange with Bulleen Road, are significant community facilities which will be impacted by the NEL. Similarly, the Carey Baptist Grammar School, Trinity Grammar School and Marcellin College sporting grounds and complexes are likely to be impacted.

The *No Go zones* map, figure 2 in *Attachment G - Project area report*, clearly illustrates the location of the Flying Fox campsite in Yarra Bend Park in the City of Yarra, the Bolin Bolin Billabong in the City of Manningham and the Banyule Flats in the City of Banyule. All three sites are located on the Yarra River in close proximity to Boroondara.

3. EPBC related concerns, issues and omissions

Council engaged industry experts to review the technical information provided by NELA in its EPBC Act referral. Consulting experts in Ecology (Dr Graeme Lorimer), Hydrology (Engeny) and Hydrogeology (John Leonard Consulting Services) provided this expert review.

Council received unanimous advice from these experts that the NELA referral is based on concept plans (as acknowledged by NELA). On this basis, it is concluded that the EPBC Act referral lacks sufficient detail in order to accurately assess the EPBC impacts of the proposed activities and therefore NELA is required to undertake further work to properly assess the impact the NEL will have on the environment. Furthermore the referral contains a number of inaccuracies and inconsistencies as well as making assumptions which are not supported by available evidence.

Most notable is the failure to address the hydrogeological effects on EPBC listed species particularly in the *No Go zones*. Given the limited spatial separation, significant tunnelling and civil works and the sensitivity of the EPBC species to water levels, failure to address these impacts is a significant flaw. As one of the consultants noted, water will not respect the *No Go zones*.

The NELA referral identified sufficient EPBC impacts for the proposed activities to be a controlled action. The combination of known impacts and potential impacts combined with significant project uncertainties are considered to be ample reason for the proposed activities to be a controlled action with a very high degree of control applied.

Council acknowledges NELA considers the NEL project is a controlled action and seeks to ensure the proposed action is properly assessed as the 'concept design' evolves.

Expert opinion on EPBC matters is summarised below.

3.1 Ecology

Ecological matters have been considered by Dr Graeme Lorimer of Biosphere Pty Ltd. The full report and details of ecological matters and concerns is provided in Appendix A.

3.1.1 River Swamp Wallaby-grass (*Amphibromus fluitans*)

The most substantial identified ecological risk posed by NEL to matters covered by the Act is to the habitat of the River Swamp Wallaby-grass (*Amphibromus fluitans*) in the wetlands along the Yarra River.

The species is listed as *Vulnerable* under the Act.

The species is known to occur at the Trinity Grammar School sporting complex. It has also been sighted in the Bolin Bolin Billabong and in close proximity to the referred project area in Bulleen and Balwyn North. It is likely the River Swamp Wallaby-grass has recolonised to the Freeway Golf Course, Burke Road Billabong and Willsmere Billabong.

The threats the NEL poses to the River Swamp Wallaby-grass fall into four categories:

- Habitat destruction from the construction of NEL.

- Bolin Bolin Billabong and Trinity Grammar School wetland system may become drier due to changes hydrology and hydrogeology caused by NEL.
- The Willsmere Billabong may be altered as a result of the Eastern Freeway widening works.
- Drainage works altering the cycle of wetting and drying of the Willsmere Billabong, Burke Road Billabong and Freeway Golf Course billabongs and wetlands.

NELA states in the referral documentation the Bolin Bolin Billabong '*is a known site of cultural significance and ecological value (non-EPBC related)*'. The billabong, however, has been known for decades to contain River Swamp Wallaby-grass, an ecological value which is EPBC related. Other documents in the NELA referral specifically cite a 2011 record of the species in the Bolin Bolin Billabong.

This is a notable and concerning inconsistency in the NELA documentation when considering the River Swamp Wallaby-grass. It highlights a lack of rigour in development of the referral.

Attachment D of NELA's referral contains a misleading and inaccurate description of what the River Swamp Wallaby-grass is like, leading to concerns about the familiarity of the author with the species.

NELA states '*...there is a low likelihood that River Swamp Wallaby-grass is located in the project area*'. This statement is simply not true, with the known population of the species in the Trinity Grammar School sporting complex.

The NELA referral claims there is '*a low likelihood that River Swamp Wallaby-grass is located [sic.] would be impacted as the project proposed tunnelling beneath areas of potential habitat*'. Tunnelling is considered to pose a risk of changing the cycle of wetting and drying that is critical to the species. Attachment D of the referral claims that, without reason or explanation, '*it is not anticipated that dewatering would impact the River Swamp Wallaby-grass*'. This is in direct contrast to guidance from the Federal Department of the Environment and Energy which recognises changing water regimes as a main identified threat to the River Swamp Wallaby-grass.

The referral documentation surprisingly does not discuss in detail any potential impact on the Bolin Bolin Billabong on the basis that it is designated a *No Go zone* area. This is of significant concern as changed water tables will not respect an arbitrary designation of a *No Go zone* area.

Bolin Bolin Billabong, a site of EPBC related ecological value owing to the presence of the River Swamp Wallaby-grass, is unavoidably at risk of significant and serious impact and change.

The lack of detailed understanding of the EPBC listed species under threat from the NEL highlights a lack of credibility in the ecological information provided by NELA in their EPBC referral.

3.1.2 Matted Flax-lily (*Dianella amoena*)

NELA acknowledges the significance under the EPBC Act of the removal of so many individuals of the Matted Flax-lily. However, NELA contends that these and other environmental impacts are deemed not to be significant when considered in isolation of each other.

The Minister for the Environment and Department of the Environment and Energy staff might reasonably consider all environmental impacts in aggregate, including the removal of many individuals of the Matted Flax-lily, and deem the total impact to be unacceptable or in need of conditions.

The Matted Flax-lily is listed as *Endangered* under the Act.

3.2 Hydrology

Hydrological matters have been considered by Engeny Water Management. The full report and details of hydrological matters and concerns is provided in Appendix B.

In general, Engeny note there is no discussion in the referral of measures to mitigate increases in total annual volume of runoff due to the increased impervious areas generated by NEL. Similarly, there was no discussion about the impact of temporary works required by NEL on the hydrological regimes in the referred project area.

The referral *Attachment B - Hydrology report* covers some of the major issues, but does not assess the full potential hydrology impacts of the NEL.

NEL includes works in the vicinity of several hydrologic features in or near Boroondara, namely:

- Bolin Bolin Billabong
- Banyule Flats
- Yarra River
- Koonung Creek
- Glass Creek

The Yarra River has significant hydrologic, habitat, cultural, landscape and heritage values. The extent of the proposed NEL works within Boroondara and in the vicinity of the Yarra River are to the west of Bulleen Road in an area commonly referred to as the Chandler Basin area.

Hydrologic issues associated with NEL and the Yarra River include:

- Floodplain management is important along the Yarra River.

A Land Subject to Inundation Overlay (LSIO) is included in the Planning Scheme for the Yarra River floodplain in Boroondara. Any works within the LSIO will require a Planning Permit from Council. Melbourne Water is the referral authority for the LSIO. Melbourne Water would be expected to apply its "Guidelines for Development in Flood Prone Areas" to any works within the LSIO to ensure that there will be no adverse impacts due to works within the Yarra River LSIO. One of the key issues in the Chandler Storage reach of the Yarra River floodplain will

be to maintain flood storage to ensure there is no adverse impact on flood hydrology. Widening of the freeway has the potential to result in a very significant loss of flood storage, especially west of Bulleen Road and south of the Eastern Freeway in the vicinity of Glass Creek.

- There is a risk of major / extreme flooding from the Yarra River floodplain impacting on the proposed tunnel under the Yarra River.

The proposed tunnel portal is located within the floodplain. We understand the tunnel portal is likely to be in the City of Manningham, but will be in close proximity to the City of Boroondara. We expect a comprehensive risk assessment will be required to ensure users of the tunnel under the Yarra River are not affected by flooding. Flooding from the Yarra River floodplain into the tunnel could represent a risk to life health and safety of tunnel users, including residents of Boroondara. While not an EPBC issue directly, the proposal to include the portal in a floodplain which may pose risk to life of tunnel users in the event of a flood suggests the proposal is not fully developed.

The Koonung Creek is largely an urban waterway that flows into the Yarra River near Chandler Highway. Potential hydrological issues associated with NEL and the Koonung Creek include:

- Shading of the Koonung Creek by bridge and other structures inducing potential changes to water temperature and habitat, including potential impacts on EPBC listed species.
- Loss of flood storage.
- Loss of small, localised wetlands.

The lack of detailed consideration of the hydrologic features likely to be impacted by NEL is of concern to Council. However, Council notes that greater detail of the NEL project will be provided as the planning process evolves beyond the concept stage.

3.3 Hydrogeology

Hydrogeological matters have been considered by John Leonard Consulting Services (Groundwater and Environmental Engineers). The full report and details of hydrogeological matters and concerns is provided in Appendix C.

Matters of concern and omissions in the hydrogeological sections of the EPBC referral are briefly outlined in this section.

The referral notes a groundwater management plan will be developed and will:

'...set out the processes, objectives, and actions to be applied to minimise, mitigate or rectify disturbance during construction, before the permanent structure is complete. The management plan would document monitoring requirements, as well as addressing issues that may have arisen during construction and which could influence the ongoing operation.'

This would be commendable, however the groundwater management plan will be *'informed by the modelling of groundwater'*.

There is concern regarding the emphasis placed on groundwater flow modelling to predict potential impacts as model predictions are inherently uncertain. Model input and development (domain discretisation, boundary conditions, hydraulic parameters, groundwater recharge etc.) are very subjective and parameter selections often disputed. Model output is inherently highly uncertain and is as often misleading as not. For example, groundwater modelling for the Melbourne City Link Tunnels failed to predict the water inflows that necessitated design changes and rehabilitation works.

The referral fails to include information about the types of aquifers (unconfined, leaky confined, semi-confined or unconfined), or aquifer porosity type (porous medium, fractured rock of dual porosity) likely to be intersected by NEL.

Our expert also notes the hydrochemical environment, including groundwater aggressiveness, is not discussed in the referral documents. Aggressive groundwaters can attack concrete and steel, effectively reducing the lifespan of a buried structure such as the proposed NEL tunnels and road infrastructure. Without knowledge of the water chemistry and the geochemical environment, the design and construction of NEL might not be appropriate.

Full consideration of the impacts and needs of dewatering to permit safe and dry excavation conditions has not been undertaken. Options for disposing any extracted groundwater and the impacts of this disposal are not addressed in the referral documents.

The missing information and reliance on highly subjective groundwater modelling to inform the groundwater management plan highlight a lack of detail in the hydrogeological information provided by NELA in its EPBC referral. On this basis, NELA will need to undertake further works to ensure that such hydrogeological matters are properly assessed.

Accordingly, the Minister is not likely to be in a position to make any conclusive finding regarding the extent of impacts, or effectiveness of mitigation measures at this early stage.

4. Conclusions

The peer review of the NELA EPBC Act referral documents has highlighted significant concerns from a Boroondara and regional perspective.

The information provided in the referral is very limited and has hampered the ability for Council and the community to conduct a full and proper assessment in the context of the EPBC Act. We note the proposal is at a 'concept design' stage only. However, Council considers that NELA has an obligation to ensure it undertakes the necessary further works so the proposal can be properly assessed.

It is considered the environmental assessment of NEL is based on incomplete and incorrect information. The referral documents contain many inconsistencies and rely on the referred project area *No Go zone* areas as a means of managing the impact on sensitive environmental areas and water bodies.

Changed water tables, such as those anticipated by NEL and known to adversely impact on the EPBC listed River Swamp Wallaby-grass, will not respect an arbitrary designation of a *No Go zone* area.

The information provided by NELA in the referral as a means of mitigating the impacts on EPBC Act species, the hydrology and hydrogeology of the referred project area and surrounding, connected areas is based on incomplete and/or incorrect information, reliant on highly subjective and questionable modelling and poorly devised. The mitigation measures do not consider, and effectively ignore, the inherent connectivity of the environmentally sensitive areas in and near the referred project area. The referral also ignores guidance from the Federal Department of the Environment and Energy about activities that threaten specific EPBC Act listed species.

It is considered the Federal Department of the Environment and Energy has a duty under the EPBC Act to apply the most rigorous environmental assessment tool to the project to ensure:

- The EPBC Act listed species in the referred project area and surrounding, connected areas are protected and remain in-situ.
- Offsets and compensation measures are not used to facilitate the delivery of NEL.
- Offsets and compensation measures are not relied upon to facilitate the delivery of NEL.
- The hydrology of the referred project area and surrounding, connected areas are not adversely impacted.
- The hydrogeology of the referred project area and surrounding, connected areas are not adversely impacted.

5. 'The Ask'

With the above in mind, it is considered appropriate and important the Minister for the Environment and Energy:

- Consider the delivery of NEL as and to be a controlled action.
- Determine the delivery of NEL as and to be a controlled action.
- Ensure the most rigorous environmental assessment of the controlled action is conducted by means of a Public Inquiry.

We note an Environment Effects Statement (EES) is currently being prepared under the Victorian *Environment Effects Act 1978*. Council acknowledges this process may constitute a suitable accredited assessment process for the purposes of assessing impacts on MNES that may be impacted by the NEL.

We do not believe assessment by way of an Environmental Impact Statement (EIS) or Public Environment Report (PER) is appropriate as these processes do not require public hearings to be held and are therefore less transparent.

6. Council contact details

Should you have any questions regarding the City of Boroondara's submission or wish to consult us at an appropriate time, please contact:

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Appendix A - Ecology report

North East Link's Impacts on Nationally Significant Ecological Matters in and near Boroondara

A report to the City of Boroondara
by Dr Graeme Lorimer, Biosphere Pty Ltd

Version 1.0, 6th February 2018

1. Introduction

The federal government's regulation of the ecological impacts of projects such as the proposed North East Link road is confined to rather narrow matters of national significance that fall under the *Environment Protection and Biodiversity Conservation Act 1999* ('EPBC Act'). The North East Link Authority (NELA) has made a formal request for the federal Minister for Environment to approve the proposed road, under the Act. The NELA acknowledges that ministerial approval is required because of:

- The planned removal of large numbers of the endangered Matted Flax-lily (*Dianella amoena*); and
- Impacts on Commonwealth land in and abutting Simpson Barracks; namely landscape alteration, excavation, alteration of Banyule Ck and potential impairment of Aboriginal heritage sites and/or views of a heritage place (Meares House).

Only the first of these points is within the scope of the present report, which is ecological.

In referring the project to the minister for his approval, the NELA have also put forward documentation in support of their contention that no other matters of national environmental significance need the minister's approval.

In what follows, I provide my opinion about whether the ecological risks are adequately conveyed by the information provided to the minister by the NELA. This report deals only with the EPBC Act, not environmental risks that fall outside the Act (but which may fall under state legislation). Also, the report is focused strongly on impacts inside the City of Boroondara or in nearby areas, notably the Bolin Bolin Billabong and wetlands at the adjacent Trinity Grammar sports complex.

North East Link is only at a concept stage, subject to possible changes in its alignment, nature of construction and details such as drainage. As a result, some of the ecological impacts are uncertain.

2. Matted Flax-lily

According to the documentation referred to the federal Minister for Environment by the NELA, the aforementioned removal of many Matted Flax Lilies would occur at various locations north of Lower Plenty Rd, from Yallambie to Greensborough. Those locations are outside the geographical focus of this report. Nevertheless, it should be noted that the NELA acknowledges the significance under the EPBC Act of the removal of so many individuals of an endangered species. Even if other environmental impacts are deemed not to be significant in isolation from each other (as contended by the NELA), the Minister for Environment might reasonably consider them in aggregate with the Matted Flax-lily, and deem the total to be unacceptable or in need of conditions.

I have no concerns about the accuracy or adequacy of the NELA referral documents in describing the impacts on the Matted Flax-lily.

3. River Swamp Wallaby-grass

Within the bounds of uncertainty created by the lack of project detail, the most substantial ecological risk posed by North East Link to matters covered by the EPBC Act, in or near Boroondara, is to the habitat of the River Swamp Wallaby-grass (*Amphibromus fluitans*) in wetlands along the Yarra River. That species is listed as 'Vulnerable' under the EPBC Act. It occurs in wetlands at the Bolin Bolin Billabong¹ and the Trinity Grammar sports complex², both of which are in Manningham. These wetlands are shown on Figure 1. River Swamp Wallaby-grass has also occurred (and may still occur) in close proximity to the proposed project area in Bulleen and Balwyn North, but detection difficulties mean that we cannot be sure whether it persists there. The species is usually undetectable except when it is in flower or seed, arising from the mud of a wetland that is drying out slowly during the warmer months – something that happens only sporadically. Seeds can be carried by water to other locations within the parent plant's wetland or into wetlands downstream. No search for the species has been done within Boroondara in recent decades during suitable conditions.

If the River Swamp Wallaby-grass does still occur in Boroondara or has recolonised from upstream, the most likely locations are the Freeway Golf Course, Burke Road Billabong and Willsmere Billabong. (Strictly speaking, the relevant parts of the Freeway Golf Course are in Manningham, even though the course is owned and run by Boroondara.) There is a 1942 herbarium specimen of River Swamp Wallaby-grass from Balwyn North on or near the current-day Freeway Golf Course. Two reliable observers have given me verbal reports of seeing the species in the 1960s in a billabong, part of which remains within the golf course. However, the part of that billabong that extended outside the golf course was destroyed for a rubbish tip during the 1960s (now part of the Carey Grammar sports complex). Of these potential sites for the River Swamp Wallaby-grass, the one most vulnerable to the proposed road project is Willsmere Park, because its billabong lies partly within the referred project area for the proposed widening of the Eastern Freeway.

¹ Victorian Biodiversity Atlas (an online resource of the Government of Victoria), accessed 29 Jan 2018.

² 'Ecological Assessment of Wetlands at the Trinity Grammar School Sporting Complex, Bulleen', report to Manningham City Council by D. Osler, D. Frood and D. Cook of Australian Ecosystems, August 2007. ii+43 pp.



Figure 1. Satellite image showing Bolin Bolin Billabong and the Trinity Grammar sports complex in relation to the referred project area..

The threats that North East Link poses to the River Swamp Wallaby-grass in or near Boroondara fall into four categories:

- Habitat may be destroyed by excavation to build the North East Link road. The two wetlands in which the species is known to occur, namely Bolin Bolin Billabong and the northern wetland at Trinity Grammar Sports Complex, are separated by approximately 50 m, which is just wide enough to accommodate Bulleen Rd with two traffic lanes in each direction. North East Link will presumably be substantially wider. Whether the road is constructed above ground or as a cut-and-cover tunnel, it will have to extend into the Trinity Grammar land and its wetland system, noting that the referred project area skirts around Bolin Bolin Billabong. The known location of the River Swamp Wallaby-grass in the Trinity Grammar wetland system is far enough away from Bulleen Rd that it is outside the referred project area, but the system may contain undiscovered plants of the species within the project area. If Trinity Grammar has no objection, a targeted search should be conducted when suitable conditions of drying mud arise;
- The Bolin Bolin Billabong and Trinity Grammar wetland system may become drier due to changed hydrology and hydrogeology caused by North East Link. The NELA's referral documents acknowledge that the project may affect groundwater levels on the Yarra River floodplain, which 'could result in stress and degradation of ecosystem health' (see $\frac{3}{4}$ of the way down p. 25 of the referral). The main concern is alteration of the cycles of inundation and drying on which the River Swamp Wallaby-grass depends. However, the magnitude of the impacts cannot be determined until more details of the road design are decided; e.g. will the section of road that separates the Bolin Bolin Billabong from the Trinity Grammar sports complex be constructed as a tunnel (as described in the text of the referral document) or be above ground (as mapped in their 'Figure 1')?

The wetland system at the Trinity Grammar sports complex was once part of Bolin Bolin Billabong, and in both cases, the River Swamp Wallaby-grass needs the Yarra's floodwaters to periodically inundate the habitat and for the water level to recede slowly. No information has been provided about the degree to which the new road will either:

- Impede floodwaters from flowing across the road to the sports complex; or
- Increase the rate of drying of the Trinity Grammar wetland system due to the barrier created against percolation of groundwater from the river.

Late 2017 saw the first implementation of a plan to periodically flood Bolin Bolin Billabong with pumped water, for environmental reasons. It may be that future pumping could partly compensate for drying that may occur to the billabong as a result of North East Link. This may not work well because the main hydrological risk to the River Swamp Wallaby-grass from North East Link is not from too little water filling the wetlands but from too rapid drying out after the water level peaks. In addition, it may be difficult to use pumping to slow the drying rate of the wetlands at the Trinity Grammar sports complex, because the complex is on private land and it is situated on the opposite side of Bulleen Rd from the Yarra River;

- The proposed widening of the Eastern Freeway may involve earthworks that directly alter the Willsmere Billabong, where the River Swamp Wallaby-grass may possibly grow. One might have expected that the freeway would be widened only on the side opposite the billabong, but the referred project area actually extends slightly into the billabong; and
- Drainage works associated with the freeway widening (whichever side of the freeway) may alter the cycle of wetting and drying of the Willsmere Billabong and (with lower likelihood, due to distance) at Burke Road Billabong and the Freeway Golf Course billabongs.

Misleading Information in the Referral

Page 5 of the NELA referral states that Bolin Bolin Billabong 'is a known site of cultural significance and ecological value (non-EPBC related)'. In fact, the billabong has been known for decades to contain River Swamp Wallaby-grass, an ecological value which is indeed 'EPBC related'. The error is repeated, verbatim, in the 'attached referral document' and 'Attachment B'.

The ecological report that forms 'Attachment D' of NELA's documentation is somewhat misleading about the appearance and stature of the River Swamp Wallaby-grass, raising concerns about unfamiliarity with the species. The claimed 1.2 m maximum height is actually the length of the stems, which are normally horizontal except when they float upward when submerged. Page 29 of 'Attachment D' states that 'While there are some suitable areas of habitat such as Banyule Swamp and Bolin Bolin Billabong, these areas are outside the referred project area or are within no go zones...there is a low likelihood that River Swamp Wallaby-grass is located within the project area'. This is not true of the abovementioned possible sites in Boroondara or of the Trinity Grammar wetland system. It is too bold to dismiss the chance that there is some River Swamp Wallaby-grass within the project area, roughly midway between the known locations of River Swamp Wallaby-grass at Bolin Bolin Billabong and the Trinity Grammar wetland system. In addition, the claim in 'Attachment D' that the River Swamp Wallaby-grass is unlikely to be within the project area conflicts with p. 32 of the associated document named '2018-8142 Referral-Attach-referral_document.pdf', which claims that 'There is a low likelihood that River Swamp Wallaby-grass is located [*sic.*] would be impacted as the project proposes tunnelling beneath areas of potential habitat'. For tunnelling to occur under potential habitat, that habitat must be within the project area, contrary to

'Attachment D'. In fact, no tunnelling is proposed beneath some of the potential habitat, and in any case, tunnelling poses a risk of changing the cycle of wetting and drying that is critical to the species.

'Attachment D' acknowledges that the impact of North East Link on groundwater is uncertain, and that 'There may be some disturbance of groundwater due to tunnelling activities... and reduce water available to wetlands reliant on groundwater'. It then states, without explanation, that 'it is not anticipated that dewatering would impact the River Swamp Wallaby-grass'. The federal Department of the Environment recognises 'changing water regimes' as a 'main identified threat' to the River Swamp Wallaby-grass³. The statement in 'Attachment D' that such impacts are 'not anticipated' from North East Link is more wishful thinking than an objective analysis of the risk.

Page 25 of the referral document explains that on floodplains, 'there can be a high degree of connectivity between surface water and groundwater', i.e. the two interact. The last full paragraph on that page explains how dewatering of a tunnel can lead to 'stress and degradation of ecosystem health, e.g. water levels could be lowered making groundwater less accessible to ecosystems'. However, the subsequent paragraph is misleading in stating that 'No EPBC Act-listed groundwater dependent communities or species have been identified within the referred project area'. In fact, the River Swamp Wallaby-grass is critically dependent on the rate of drying of its wetland habitat, and hence on groundwater. It is not surprising that the River Swamp Wallaby-grass was not 'identified within the referred project area' at the Trinity Grammar wetland complex because the consultants evidently did not look there and the phase of the wetting and drying cycle was not suitable. That shortcoming should have been acknowledged.

The referral documents dismiss any potential impact to Bolin Bolin Billabong on the basis that it is designated a 'no go area'. Changed water tables will not respect an arbitrary designation of a 'no go area', and Bolin Bolin Billabong is unavoidably at risk of such change. The 'no go area' designation has had the unfortunate consequence of effectively quarantining it from investigation, even in regard to off-site impacts.

'Attachment C' of the referral documents deals with the effects of a tunnel on groundwater, wetlands and streams. Strangely, it only considers the hydrogeological impacts of the proposed tunnel north of Manningham Rd, even though Section 1.2 of the same document indicates a plan to construct another tunnel past Bolin Bolin Billabong, ending south of the Veneto Club. This seems a significant oversight.

4. Other Species and Ecological Communities

In addition to the Matted Flax-lily and River Swamp Wallaby-grass, all other species and communities listed under the EPBC Act are considered in the documents referred to the federal Minister for Environment by the NELA. In my view, these additional species and communities have been adequately assessed and there is a sound basis for the conclusion that none of them, considered individually, would be significantly impacted by North East Link, in the sense of the EPBC Act. Even when the impacts are considered in aggregate rather than in isolation, I believe only the Matted Flax-lily and River Swamp Wallaby-grass are at risk of creating a significant impact at the national scale.

³ Department of the Environment (2018). 'Threats' paragraph of the web page for *Amphibromus fluitans* in the 'Species Profile and Threats Database' of the federal Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>. Accessed 29 Jan 2018.

5. Impacts Outside the EPBC Act

The EPBC Act has a very narrow purview because the Australian constitution gives states and territories jurisdiction for most environmental matters. In addition, some species are not listed under the Act simply because nobody has yet nominated them.

As a result, most environmental impacts of North East Link cannot be considered under the EPBC Act. Separate assessment processes at the state and municipal level are commencing to consider the additional impacts.

6. Inconsistencies and Oversights in the Referral

Review of the documents referred by the NELA under the EPBC Act has faced difficulties because of the internal inconsistencies and oversights listed below. Unless these inconsistencies are resolved, I believe the federal Minister for the Environment and his staff will have difficulty making a properly informed assessment of the referral. I would recommend seeking further information from the NELA.

- The primary referral document and several of the attachments refer to a tunnel with a southern portal south of the Veneto Club. 'Figure 1' provides a plan of the project area and it indicates that the North East Link road will be above ground, not a tunnel, along Bulleen Rd. Where the documents refer to the potential for tunnels to affect wetland ecosystems, they do so only in regard to the proposed tunnel north of Manningham Rd. If NELA really does consider a tunnel along Bulleen Rd to be an option, its effects should have been assessed.
- In the primary referral document, at the junction between pp. 25 and 26, is the paragraph:

'No EPBC Act-listed groundwater dependent communities or species have been identified within the referred project area. Further assessment of groundwater interactions with ecological values will be undertaken as part of the EES. This will include preparation of a groundwater model based on the reference design to assess changes to groundwater levels and potential impacts on this community.'

If no groundwater-dependent communities have been identified, how can the NELA assess 'potential impacts on this community'?
- In the 'attached referral document' and 'Attachment D', the River Swamp Wallaby-grass is recognised as being listed under the EPBC Act. A record of the species' occurrence from 2011, which is from Bolin Bolin Billabong, is specifically cited. Yet the same documents and the primary document all state that Bolin Bolin Billabong 'is a known site of cultural significance and ecological value (non-EPBC related)'. The phrase in parenthesis is wrong.
- 'Attachment D' correctly describes the habitat of the River Swamp Wallaby-grass as being wetlands. Several of the referral documents indicate that a tunnel will be constructed adjacent to Bolin Bolin Billabong, and there are clear acknowledgments that tunnel dewatering can reduce the water in wetlands. Page 29 of 'Attachment D' draws the inconsistent conclusion that 'it is not anticipated that dewatering would impact the River Swamp Wallaby-grass', without explanation.
- The referral documentation states that Bolin Bolin Billabong, and what the authors regard as potential habitat for the River Swamp Wallaby-grass, are outside the 'referred project area' and hence at no risk from the project. It is a significant oversight to ignore the potential for off-site impacts such as altering the groundwater table.

- The referral documents have been prepared without an awareness that the River Swamp Wallaby-grass grows in the wetland system at the Trinity Grammar sports complex. That wetland system was part of Bolin Bolin Billabong before Bulleen Rd was constructed.
- The referral documents overlook the reality that the proposed North East Link road would have to pass through the wetlands at the Trinity Grammar sports complex.

Appendix B - Hydrology report



City of Boroondara

North East Link

EPBC Referral Hydrology Review



February 2018

V2002_006

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CONTENTS

| | | |
|-----|--------------------------------------|----|
| 1. | INTRODUCTION | 1 |
| 2. | BACKGROUND INFORMATION | 2 |
| 3. | LOCATION | 3 |
| 4. | HYDROLOGIC ISSUES..... | 4 |
| 4.1 | Bolin Bolin Billabong | 6 |
| 4.2 | Banyule Flats | 6 |
| 4.3 | Yarra River | 6 |
| 4.4 | Koonung Creek..... | 8 |
| 4.5 | Glass Creek..... | 9 |
| 4.6 | Local Drainage Catchments..... | 9 |
| 5. | ENVIRONMENTAL EFFECTS STATEMENT..... | 11 |
| 6. | CONCLUSION..... | 12 |
| 7. | QUALIFICATIONS..... | 13 |

Appendices

| | |
|------------------|--------------------------------|
| APPENDIX A | EXISTING FLOOD OVERLAY PLAN |
| APPENDIX B | DRAFT BOROONDARA FLOOD MAPPING |

1. INTRODUCTION

Engeny has been commissioned by Boroondara City Council to prepare a report highlighting potential hydrologic issues associated with the proposed North East Link works within the City of Boroondara and surrounding areas. This report considers available information and highlights issues that need further attention in relation to changes to hydrology.

We understand that the EPBC Act requires potential impacts on referral species to:

- Be avoided wherever possible
- To be mitigated if avoidance is not fully possible
- Have compensation measures implemented where avoidance and mitigation options have been exhausted to compensate for any residual impacts.

Our team has previously been involved in significant approval or review roles for major transport projects in Victoria, including:

- City Link
- EastLink
- Peninsula Link
- Geelong Freeway widening
- Goulburn Valley Highway Duplication
- Monash Freeway Upgrade
- M80 upgrade.

From this experience we are aware that these previous projects were required to undertake significant local works to offset their hydrologic impacts and / or to bring the road corridors up to a more acceptable standard. Examples of significant hydrologic works for road projects include Eastlink that had 60 new wetlands constructed, as well as waterway corridor widening, concrete channel removal (e.g. Dandenong Creek in Dandenong South), waterway stabilisation and significant planting.

2. BACKGROUND INFORMATION

Engeny has reviewed and considered the following information:

- EPBC referral – North East link Project, signed on 15 January 2018 and Attachments B to F to the referral.
- Other publically available information online regarding North East Link.

The relevant legislation relevant to hydrology that are discussed in the EPBC referral document, include the Water Act 1989 and the Victorian Planning Provisions. The Hydrology report is Attachment B to the referral and refers to the hydrology and water quality for five waterways within the North East link referred project area:

- Yarra River
- Plenty River
- Merri Creek
- Koonung Creek
- Banyule Creek.

Of these waterways the Yarra River and Koonung Creek are within the City of Boroondara. Other waterways and hydrologic features within or adjacent to the City of Boroondara that will be impacted by the North East Link include:

- Bolin Bolin Billabongs
- Banyule Flats
- Glass Creek
- Local drainage catchment / systems.

3. LOCATION

The extent of the proposed North East Link works within or adjacent to the City of Boroondara includes:

- Road tunnels under the Yarra River and a portal south of the Veneto Club in Bulleen Road (in the City of Manningham)
- A surface road adjacent to Bulleen Road from the proposed tunnel portal to the Eastern Freeway
- An interchange between the North East Link and the Eastern Freeway at the existing Bulleen Road interchange
- Widening (by 5 to 40 metres) of the Eastern Freeway west of Bulleen Road to around Hoddle Street
- Widening (by 5 to 40 metres) of the Eastern Freeway east of Bulleen Road to Springvale Road.

North East Link includes works in the vicinity of the following hydrologic features in or adjacent to the City of Boroondara:

- Bolin Bolin Billabong
- Banyule Flats
- Yarra River
- Koonung Creek
- Glass Creek
- Local drainage catchment / systems.

Hydrologic impacts in each of these areas are considered in Section 4 of this report.

4. HYDROLOGIC ISSUES

This report considers the hydrologic impacts of the proposed North East Link. In determining hydrologic impacts we have considered the contents of the EPBC referral. Key parts of the EPBC referral document in relation to hydrology include:

- The approach to the North East Link design is discussed on page 32 of the North East Link EPBC referral document under heading 4.1.
- Potential project wide impacts and the regulatory regime are discussed on pages 32 and 33 of the EPBC referral document.
- Specific management measures to reduce impacts on EPBC Act listed species are discussed on pages 33 to 36 of the North East Link EPBC referral document.
- Hydrology impacts on the area are discussed on pages 36 to 37 of the North East Link EPBC referral document.

The referral document and Attachment B to the referral document, which is the hydrology report by GHD, propose the following measures in relation to hydrology and / or hydrologic impacts on EPBC:

- Water Sensitive Road Design works to treat runoff from additional paved areas to manage runoff quality in accordance with the Best Practice Environmental Management Guide for Stormwater, CSIRO 1999 (BPEMG) which has key targets embedded in Clause 56.07 of the Planning Scheme and the State Environment Protection Policy, Waters of Victoria (SEPP, WoV).
- Flow retention for runoff from additional paved areas to ensure there is no increase in peak flood flows from the proposed works.
- Off site treatments and offset payments are referred to on page 15 of Attachment B to the EPBC referral (GHD hydrology report) as options to manage potential impacts of the works.

Our view is that offset payments must not be considered unless all other options have been exhausted and it can be demonstrated that the offset payments can be used to genuinely offset the hydrologic impact. No details were provided of any offset treatment works as to what is proposed or where they may be located. It is important that local impacts be mitigated or fully offset locally to maintain local performance of the hydrologic system and local amenity. For example we would expect that the increase in paved areas in Boroondara would require an increase in wetlands to be provided in Boroondara (and definitely not a decrease).

No discussion of measures was noted in the EPBC referral to mitigate increases in total annual volume of runoff due to increased impervious areas. Extra paved areas reduce infiltration and evapotranspiration and increase the total volume of runoff. Even if best practice measures are used to treat runoff and reduce peak flows there will be a deleterious impact on receiving waters due to increased impervious surfaces caused by increased total volumes of runoff and changes in the flow regime.

There was no discussion in the referral document or the hydrology report about the impact of temporary works and mitigation of their impact. Our recent work on assessing the hydrology of the Heidelberg – Rosanna Rail Duplication project has included analysis of impacts of temporary works, particularly in relation to flooding and we would expect that all temporary works impacts will need to be independently assessed for North East Link.

Impacts on surface water hydrology from the North East Link works in the City of Boroondara, could include:

- Loss of flood storage
- Impeding overland flow paths
- Increased runoff peak flow
- Increasing runoff pollutant loads
- Increasing overall volume of runoff
- Impact on waterway corridors.

These impacts are related to EPBC issues and / or other issues associated with the Planning Scheme or the Water Act.

The EPBC hydrology report covers some of the major issues, but as yet does not cover the majority of the potential hydrology impacts. For example one of the major potential impacts on hydrology of a new freeway standard road crossing of the Yarra would be on the Yarra River and Bolin Bolin Billabong if a surface road solution was proposed. The North East Link design and the EPBC referral proposes a tunnel under the Yarra River as an important part of the design to avoid significant surface water hydrologic impacts on the Yarra River and the Bolin Bolin Billabong that would occur if a surface road was constructed.

The areas where hydrological impacts need to be considered further are discussed under the following headings for each area.

4.1 Bolin Bolin Billabong

The Bolin Bolin Billabong is a highly sensitive environmental area in the City of Manningham between the Yarra River and Bulleen Road.

The North East Link tunnels are proposed to avoid surface road works in the vicinity of the Bolin Bolin Billabong. This is an important part of reducing North East Link's potential impact on surface hydrology.

It should be noted that while the Bolin Bolin Billabong is not in Boroondara that Boroondara Council nevertheless has an interest in the area. We understand that a stormwater wetland and stormwater harvesting system has been jointly funded by Boroondara and Manningham to protect the hydrology and water quality of the billabong. It is therefore of interest to Boroondara that no works occur that would adversely alter the hydrology of the Bolin Bolin Billabong or its upstream catchment.

It is not yet clear from the documents reviewed whether or not there will be any temporary, ancillary or minor works proposed that may impact on surface water at Bolin Bolin Billabong. It is important that any works whatsoever that may impact on Bolin Bolin Billabong are properly assessed.

4.2 Banyule Flats

Banyule Flats is an area on the north side of the Yarra River in the City of Banyule. There are significant wetland features on Banyule Flats, including two water bodies adjacent to the Banyule East Main Drain. The Banyule Flats area forms an important hydrologic, environmental, cultural and open space area adjacent to the City of Boroondara that is enjoyed by Boroondara residents as part of the Yarra River valley. We understand that Melbourne Water has undertaken significant work to ensure that the hydrology in Banyule Flats supports the wetland hydrology, flora and fauna. It is important that there are no adverse hydrologic impacts on Banyule Flats.

4.3 Yarra River

The Yarra River is the major waterway through Greater Melbourne. The Yarra River has significant hydrologic, habitat, cultural, landscape and heritage values.

The Boroondara Planning Scheme has a number of provisions related to the Yarra River.

Melbourne Water is the authority responsible under the Water Act 1989 for floodplain management and the bed and banks of the Yarra River.

The design of the North East Link proposes to locate major road tunnels under the Yarra River to avoid some of the key potential hydrologic risks associated with the project.

The extent of the proposed North East Link works within the City of Boroondara and in the vicinity of the Yarra River are located west of Bulleen Road. This area is within a reach of the Yarra River commonly referred to as the Chandler Basin area by Melbourne Water. Parts of this reach of the Yarra River are significant for a number of reasons, including:

- Flood storage
- Riparian zones
- Habitat
- Open space
- Linear trails
- Heritage, including indigenous heritage and other aspects of heritage including important views recorded in paintings by the Heidelberg School artists in the 19th century.

Hydrologic issues associated with North East Link and the Yarra River include:

- Setbacks from the river are required for works. Under the Planning Scheme works need to be referred to Melbourne Water if they are within a 100 m setback from the top of bank of the river.
- Floodplain management is important along the Yarra River. A Land Subject to Inundation Overlay (LSIO) is included in the Planning Scheme for the Yarra River floodplain in Boroondara. Any works within the LSIO will require a Planning Permit from Council. Melbourne Water is the referral authority for the LSIO. Melbourne Water would be expected to apply its “Guidelines for Development in Flood Prone Areas” to any works within the LSIO to ensure that there will be no adverse impacts due to works within the Yarra River LSIO. One of the key issues in the Chandler Storage reach of the Yarra River floodplain will be to maintain flood storage to ensure that there is no adverse impact on flood hydrology. Widening of the freeway has the potential to result in a very significant loss of flood storage, especially west of Bulleen Road and south of the Eastern Freeway in the vicinity of Glass Creek.
- There is a risk of major / extreme flooding from the Yarra River floodplain impacting on the proposed tunnel under the Yarra River. The proposed tunnel portal is located within the floodplain. We understand that the tunnel portal is likely to be in the City of Manningham, but will be in close proximity to the City of Boroondara. We expect that a comprehensive risk assessment will be required to ensure users of the tunnel under the Yarra River are not affected by flooding. Flooding from the Yarra River floodplain into the tunnel could represent a risk to life health and safety of tunnel users, including residents of Boroondara.

- During construction the North East Link works are likely to result in sediment laden and otherwise polluted runoff being discharged into the Yarra River. Measures will need to be in place throughout construction to manage this risk.
- Removal of vegetation along the Yarra River will likely increase erosion risks, increase local flows (and remove habitat) and assessments will be required to ensure that any vegetation removal does not have adverse hydrologic impacts (as well as any other adverse impacts).

4.4 Koonung Creek

Koonung Creek is an urban waterway that flows into the Yarra River near Chandler Highway. From Springvale Road to Doncaster Road the creek is an open waterway adjacent to the Eastern Freeway. From Doncaster Road to Thompsons Road near the Boroondara Tennis Club the creek is in a large underground culvert. From Thompsons Road to the Yarra River the creek is an open waterway through parkland, playing fields and a golf course. Since the construction of the Eastern Freeway significant erosion protection work and revegetation has occurred along Koonung Creek, especially upstream of the culvert.

We expect that the North East Link works will require a wide bridge structure over Koonung Creek adjacent to Bulleen Road.

Potential hydrologic issues associated with North East Link and Koonung Creek include:

- Bridge structure over Koonung Creek and the potential to adversely impact on flows within the creek banks and/or floodplain flows from Koonung Creek.
- Removal of vegetation.
- Shading of Koonung Creek by bridge structures and potential changes to water temperature and habitat, including potential impacts on EPBC species.
- Loss of flood storage.
- Setback from creek banks will be required for works. A referral is expected to be required to Melbourne Water regarding potential impacts on the creek and the floodplain.
- There is a local surface water wetland in the open space adjacent to Koonung Creek between the north end of Tannock Street and the existing Eastern Freeway within the City of Boroondara. This wetland is within approximately 20 m of the existing Eastern Freeway soundwall and is likely to be impacted by Eastern Freeway widening works. No mention of this wetland is made in the EPBC referral. We would expect that the existing wetland should be retained and if anything increased to assist in offsetting the increase in impervious area due to North East Link. Increasing the freeway footprint

and possibly the wetland footprint may still have an adverse impact in terms of the loss of existing open space.

- There are other wetland and open creek features along Koonung Creek upstream of Doncaster Road (outside the City of Boroondara) that may be impacted by the Eastern Freeway widening, which could result in loss of flood storage and subsequent increases in flows through Boroondara. Another impact of freeway widening upstream of Doncaster Road could be loss of existing wetlands or increased pollutant runoff from the extra impervious area that would impact water quality for flows through Boroondara and reduction of the amenity of Boroondara residents using the linear trail and open space along this reach of Koonung Creek.

4.5 Glass Creek

Glass Creek is a Melbourne Water creek located within the City of Boroondara. Glass Creek flows under the Eastern Freeway at Hays Paddock and then northwards through Kew Golf Club to the Yarra River

There is a significant flood storage area on the upstream side of the Eastern Freeway as shown by the extent of the LSIO on the plan in **Appendix B**. The extent of the LSIO considers both flood storage from backwater from a long duration major flood in the Yarra River catchment and/or a shorter duration peak flood in the Glass Creek catchment. Widening of the Eastern Freeway on the south side of the existing freeway could have a substantial impact on the loss of flood storage in the lower reach of Glass Creek. Within this area is significant Council owned and managed land.

Widening of the Eastern Freeway at Glass Creek could also have the effect of lengthening the Glass Creek culvert under the freeway which would reduce the culvert capacity and combined with the loss of flood storage could increase flood levels south of the Eastern Freeway to the detriment of Council land and other properties.

A detailed before and after flood study and assessment of impacts on the Glass Creek system and referral to Council and Melbourne Water is expected to be required as part of the design and approval process for North East Link. The impact of loss of flood storage needs to be modelled for a full range of flood events and compensatory provision of flood storage and works to ensure no adverse hydrologic impacts will be required.

4.6 Local Drainage Catchments

There are a number of City of Boroondara and Melbourne Water local drainage systems that will be impacted by North East Link.

Existing flowpaths for Council drains and Melbourne Water main drains have been and are currently being flood mapped. Preliminary results from the flood mapping for the local drainage network are shown on the plans in **Appendix C**. We expect that the designs for the Eastern Freeway widening in Boroondara will need to be assessed against the latest flood models to ensure that there is no adverse hydrologic impact and that the cost of this work is borne by the North East Link project and not by the City of Boroondara.

CITY OF BOROONDARA
NORTH EAST LINK

The Eastern Freeway was flooded in 2005 in the vicinity of Bulleen Road and Burke Road as a result of intense storms and runoff from local catchments. The freeway was closed and a number of vehicles on the Eastern Freeway were trapped by floodwater. This section of the freeway is currently flood prone from either backwater from a major flood in the Yarra River or from local runoff. Adding lanes will add more runoff and extra road users to this area, increasing the overall flood hazard, especially for intense local storms. The widening of the Eastern Freeway through this area needs to be designed to ensure the flood hazard is not increased and to reduce the flood hazard to within acceptable limits.

5. ENVIRONMENTAL EFFECTS STATEMENT

According to the EPBC referral prepared for North East Link an Environmental Effects Statement (EES) is proposed for the project, subject to approval of the process by the Victorian Minister for Planning.

Should an EES proceed then this would provide a process and a forum for the City of Boroondara to raise environmental issues and seek their resolution. Comments from this report could be included in Council's submission on the EES.

6. CONCLUSION

The proposed North East Link project includes significant works within and adjacent to the City of Boroondara. The project will have hydrologic impacts that could impact on the EPBC referral for the project. The project may also have other hydrologic impacts that will need consideration by the City of Boroondara and Melbourne Water. A number of the expected hydrologic issues of interest to the City of Boroondara are documented in this report.

The North East Link Authority has prepared an EPBC referral application to the Federal Government with a number of appendices, including a hydrology report. The current level of documentation does not provide sufficient detail to show the final design of the proposed works, nor exactly how the works will ensure that there is no adverse hydrologic impact. Some of the larger potential surface water hydrology impacts (such as a surface road crossing of the Yarra River and the Bolin Bolin Billabong) have been proposed to be addressed by adopting road tunnels under these highly sensitive areas.

The available information does discuss a number of hydrologic issues and some of the principles for assessing and mitigating other hydrologic impacts, but does not provide sufficient details to document the hydrologic impacts nor the effectiveness of mitigation measures.

Our view is that offset payments must not be considered unless all other options have been exhausted and it can be demonstrated that the offset payments can be used to genuinely offset the hydrologic impact. No details were provided of any offset treatment works as to what is proposed or where they may be located. It is important that local impacts be mitigated or fully offset locally to maintain local performance of the hydrologic system and local amenity. For example we would expect that the increase in paved areas in Boroondara would require an increase in wetlands to be provided in Boroondara (and definitely not a decrease).

It will be important for the North East Link designers to address all hydrologic issues, show how the proposed works will either have no adverse impacts, or how any adverse impacts will be fully compensated by works to be done as part of the project. We understand that there are processes under the Planning Scheme and the Water Act that will require North East Link to demonstrate how hydrologic issues are to be managed and to seek specific approvals.

There are likely to be opportunities for the City of Boroondara to have input to the North East Link project. If the Victorian Minister for Planning decides to require an EES for the project then Council can be involved through the consultation and approval process for the EES.

7. QUALIFICATIONS

- a. In preparing this document, including all relevant calculation and modelling, Engeny Water Management (Engeny) has exercised the degree of skill, care and diligence normally exercised by members of the engineering profession and has acted in accordance with accepted practices of engineering principles.
- b. Engeny has used reasonable endeavours to inform itself of the parameters and requirements of the project and has taken reasonable steps to ensure that the works and document is as accurate and comprehensive as possible given the information upon which it has been based including information that may have been provided or obtained by any third party or external sources which has not been independently verified.
- c. Engeny reserves the right to review and amend any aspect of the works performed including any opinions and recommendations from the works included or referred to in the works if:
 - (i) Additional sources of information not presently available (for whatever reason) are provided or become known to Engeny; or
 - (ii) Engeny considers it prudent to revise any aspect of the works in light of any information which becomes known to it after the date of submission.
- d. Engeny does not give any warranty nor accept any liability in relation to the completeness or accuracy of the works, which may be inherently reliant upon the completeness and accuracy of the input data and the agreed scope of works. All limitations of liability shall apply for the benefit of the employees, agents and representatives of Engeny to the same extent that they apply for the benefit of Engeny.
- e. This document is for the use of the party to whom it is addressed and for no other persons. No responsibility is accepted to any third party for the whole or part of the contents of this report.
- f. If any claim or demand is made by any person against Engeny on the basis of detriment sustained or alleged to have been sustained as a result of reliance upon the report or information therein, Engeny will rely upon this provision as a defence to any such claim or demand.
- g. This report does not provide legal advice.
- h. This report does not provide specialist advice regarding planning matters, flora or fauna.

APPENDIX A

Existing Flood Overlay Plan

APPENDIX B

Draft Boroondara Flood Mapping

Appendix C - Hydrogeology report

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RE: NORTH EAST LINK HYDROGEOLOGY REVIEW
CITY OF BOROONDORA**INTRODUCTION**

John Leonard Consulting Services Pty Ltd (JLCS) was engaged by Engeny Pty Ltd on behalf of the Boroondara City Council to review hydrogeological aspects of the proposed North East Link (NEL) and potential groundwater related impacts.

- Important aspects of the JLCS review included:
- Description of the proposed engineering works
- Description of the geology and hydrogeology along the NEL.
- Identification of potential adverse impacts associated with construction of the NEL and post construction phase.
- Assess whether potential adverse impacts could be avoided.
- Assess whether measures to mitigate potential adverse impacts been identified and whether they are appropriate.

For review purposes, I prepared a number of maps (georeferenced to MGA94 Z55 coordinate system) including proposed route (extracted from the Hydrology report) and geological outcrop map (extracted from the online digital seamless geological maps, GeoVic website).

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NEL Route and Boroondara Local Government Area

The NEL is a proposed new freeway standard road connecting the Western Ring Road (M80) to the Eastern Freeway. The NEL would include:

- Western Ring Road to Lower Plenty Road - from the M80 and Greensborough Bypass to the northern tunnel portal, this section would include a mixture of above, below and at surface road sections, with new road interchanges at M80, Grimshaw Street and Lower Plenty Road.
- Tunnels - from the northern tunnel portal located just north of Lower Plenty Road to south of Manningham Road, twin tunnels would travel under residential areas, Banyule Flats and the Yarra River. Near each tunnel portal, supporting tunnel infrastructure would be required, including ventilation structures, substations and associated infrastructure. This section would include a new interchange at Manningham Road.
- Bridge Street to Eastern Freeway -this section would include open cut and bored or mined tunnel with the southern tunnel portal located south of the Veneto Club. Further south, surface road and viaduct structures would connect to the Eastern Freeway via a new interchange.
- Eastern Freeway upgrades - from around Hoddle Street in the west through to Springvale Road in the east, modifications to the Eastern Freeway would include widening to accommodate future traffic volumes, provision of new dedicated bus lanes for rapid bus services (Doncaster Busway) and associated works.

Limited information has been provided on design of the proposed Freeway including tunnel type (fully tanked), diameter or depth, or depth of any freeway cuts.

The various Freeway segments are plotted on georeferenced satellite image in Figure 1 and geological outcrop map in Figure 2. The majority of the NEL works would be in the area to the north of the City of Boroondara with less than 500 m within the City of Boroondara. Proposed NEL works within or adjacent to the City of Boroondara include:

- The road tunnels under the Yarra River and the portal south of the Veneto Club in Bulleen Road (in the City of Manningham)
- A surface road adjacent to Bulleen Road from the proposed tunnel portal to the Eastern Freeway
- An interchange between the North East Link and the Eastern Freeway near the existing Bulleen Road interchange
- Widening (by 5 to 40 metres) of the Eastern Freeway west of Bulleen Road to around Hoddle Street

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- Widening (by 5 to 40 metres) of the Eastern Freeway east of Bulleen Road to Springvale Road.

REVIEWED DOCUMENTS

The main documents reviewed were:

NORTH EAST LINK PROJECT. EPBC Referral Attachment C - Hydrogeology Report. Revision 0. GHD Pty Ltd, 12 January 2018. 6p.

EPBC Act referral - North East Link Project. Australian Government, Department of the Environment and Energy. 62p.

The Hydrogeology Report (GHD, 2017) is very brief (6 pages in total) with only three pages of text, and no figures. [By comparison the Hydrology Report (GHD, 2013) is 26 pages long.] Similar hydrogeology related information is included in the EPBC Referral document.

The EPBC Referral document includes much of the descriptions as in the GHD Hydrogeology Report, albeit generally arranged under different headings.

HYDROGEOLOGY REPORT – GHD 2017

Page 1 provides an introduction to the project including 1) purpose of the report, 2) Description of proposed works, and 3) relevance to the EPBC Act. An important point noted in the Introduction section of the GHD Hydrogeological Report is that “development of the concept design is ongoing.”

Page 2 briefly describes the existing Hydrogeology including rock types, likely groundwater depth and salinity (broad ranges only), and general statements on interactions between groundwater and surface water, and possible occurrences of Groundwater Dependent Ecosystems.

Page 3 describes Hydrogeological considerations in the design. This page is the crux of the GHD report and is reproduced below in its entirety for reference purposes:

The project includes a tunnel passing under the Yarra River and the Banyule Wetlands. Parts of the tunnel will be below the watertable. and therefore disturbance to the groundwater environment could occur as part of tunnel and associated portal construction, i.e. dewatering to maintain safe and dry excavation conditions, and on-going operation. Depending upon the extent and magnitude of dewatering, the dewatering can reduce water availability to dependent ecosystems, and depending on the level of reliance and the availability of alternative water sources, this could result in stress and degradation of ecosystem health, e.g. water levels could be lowered making groundwater less accessible to ecosystems. As well as potentially altering the accessibility of groundwater, over the long term, groundwater quality changes may also result. To manage potential impacts, dewatering would be minimised through adoption of specific tunnel design measures and implementation of a groundwater management plan.

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Connection between the Yarra River and groundwater within the project area is expected to be variable along its reaches, and aquifer of interest. This will be confirmed through geotechnical investigations. Flow in the regulated Yarra River is influenced by releases from the Upper Yarra Reservoir, but is expected to be orders of magnitude greater compared to the quantity of groundwater seepage contributing to its flow over the reach within the project area. Under these conditions, groundwater dewatering activities are unlikely to have a measurable impact upon flows within the Yarra River. However, dewatering activities may have a measurable effect on smaller tributaries, and billabongs connected with the groundwater.

Specific design measures such as the tanking or water proofing of the tunnel and other buried structures would be adopted as appropriate to achieve a desired outcome with the permanent works or operation condition. Tanked, sealed or undrained structures minimise entry of groundwater and therefore the resultant disturbance to the groundwater environment is minimised. Also, by minimising changes to groundwater levels, changes in the movement of groundwater are also reduced. This reduces the risk of disturbance of contaminated groundwater plumes, or mixing of groundwaters of differing quality. Drained structures allow groundwater entry and therefore there is significantly greater disturbance to the groundwater environment and would be therefore avoided by the project where this is a possibility.

A groundwater management plan includes measures that minimise disturbance to, and protect, the groundwater environment. A plan would be implemented during construction, as the construction method itself may result in impact to groundwater, and in some cases greater impacts compared to those arising from the completed, permanent structure. The management plan would set out the processes, objectives, and actions to be applied to minimise, mitigate or rectify disturbance during construction, before the permanent structure is completed. The management plan would document monitoring requirements, as well as addressing issues that may have arisen during construction and which could influence the ongoing operation.

Both reviewed reports state that... “*The (groundwater) management plan would document monitoring requirements, as well as addressing issues that may have arisen during construction and which could influence the ongoing operation.*” When available, the groundwater management plan should be critically reviewed.

GROUNDWATER CONTROL MEASURES

Common groundwater control measures that could be implemented include:

- Dewatering by passive drainage
- Dewatering by pumping groundwater either directly from excavations or from purpose installed dewatering bores and/or spear-point systems.
- Ground Freezing
- Low permeability cut-off walls and barriers
 - Steel sheet-piles

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Concrete diaphragm walls and secant pile walls
 Slurry walls and trenches
 Grout curtains (including permeation grouting, rock grouting and jet grouting)
 Freeze walls (produced by artificial ground freezing).

- Compressed air tunnelling

As the NEL Freeway design is apparently “work in progress” I cannot comment on the adequacy of the design or on likely adverse impacts associated with freeway construction in detail.

GROUNDWATER MODELLING

The EPBC referral document (p25) reproduces the last paragraph (above) but significantly adds that the groundwater management plan would be “*informed by the modelling of groundwater*” The type of model (analytical or numerical) was not stated on page 25 but was described on page 37 as.... “*A predictive and numerical groundwater model would be developed and updated iteratively to take account of construction techniques or operational design features to manage the likelihood of the potential impacts to groundwater levels.*”

I am concerned by the emphasise that is apparently placed on groundwater flow modelling to predict potential impacts as model predictions are inherently uncertain. Model input and development (domain discretisation, boundary conditions, hydraulic parameters, groundwater recharge, etc.) are very subjective and parameter selections often disputed, for example the recent highly controversial disagreement by different experts on modelling of the proposed Carmichael Coal Mine in Queensland and less publicised disagreement on modelling the Tyrell Basin in northwestern Victoria.

Model output is inherently highly uncertain and is as often as not misleading, as concluded by Clifford Voss, the Executive editor of the prestigious Hydrogeology Journal in the second of his two-part Editors message (2011)..... “*Groundwater modeling has become a self-supporting industry of fantastical promises that cannot be kept and, in most cases, cannot ever be tested. The industry is selling individual models at costs far beyond their true value. Indeed model results have become so realistic and complex in appearance, it is difficult to tell a simulation result from a detailed remote-sensed image of the earth’s surface. The wonderful apparition of a color map, as the model result, containing uncountable details of the groundwater system being represented, is misleading. Who would dare cross a bridge designed with the same level of uncertainty as inherent in such a groundwater model analysis? Managers, who are often not modelling experts, have no means to judge such results, except to appreciate their apparent beauty and complexity. Modelers who create such results are trying to impress—but, in truth, are misleading their clients.*” {Reference: Voss, C. I. (2011). Editor’s message: Groundwater modelling fantasies—part 2, down to earth. Hydrogeology Journal 2011, 19: pp 1455-1458.]

The groundwater modelling pre-construction of the City Link tunnels in the mid 1990s did not predict the groundwater inflows that necessitated design changes and expensive rehabilitation works. [I was initial “Proof Hydrogeologist” engaged by the Proof Engineers, Halcrow Water Power, and the first to identify major concerns with the groundwater modelling.]

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Unfortunately, very few groundwater models are audited. An exception worth noting was the audit of the groundwater model used to predict construction dewatering and post construction water table impacts at the Britomart Transport Centre, a large watertight structure in Auckland, New Zealand. The audit showed that the actual drawdown during construction dewatering differed from the model predicted drawdown by more than three metres. Not surprising the model predicted hydraulic head following completion of the water tight structure were close to measured hydraulic heads. [Reference: Mamjou, P. and Pattle, A (2006). Post-Audit of a numerical groundwater flow model developed for Britomart Transport Centre, Auckland New Zealand.]

Although models are very useful in identify data gaps and to guide field investigation, model prediction, even so-called calibrated models, should be viewed with caution as model solutions are non-unique, e.g., different combinations of input parameters can generate the same hydraulic head distribution but the associated water balances can be significantly different.

I concede that models could provide insight as to which design option would potentially have less environmental impact in a relative sense; e.g., lined versus unlined tunnel segments. However, it could equally be argued that an expensive model is not needed to identify the design with the least potential environmental impacts.

A more applicable approach would be to undertake a Risk Assessment and to develop contingency plans to mitigate adverse environmental impacts during both construction and post construction phases.

Report Omissions

Omissions from the two sighted reports are briefly discussed below. The list of “omissions” is not exhaustive most but potential issues not included in the reviewed reports are considered. [The report omissions are discussed in no particular order.]

- Significantly, neither the Hydrogeology Report nor the EPBR Referral Document included a geological map or discussed types of aquifers (unconfined, leaky confined, semi-unconfined or unconfined), or aquifer porosity type (porous medium, fractured rock, or dual porosity) likely to be intersected by the proposed NEL.
- The Hydrogeology Report makes passing reference to contaminated groundwater in report Section 3. Areas of contaminated groundwater should be identified and potential impacts assessed if engineering works associated with the NEL link intersect or mobilise contaminated groundwater. Major road and rail infrastructure projects generally include specific reports on groundwater contamination. Such investigation, assessment and reporting should be part of the NEL project.
- The hydrochemical environment including groundwater aggressiveness was not discussed in either of the reviewed reports. Aggressive groundwaters can attack concrete and steel and can reduce the “life” of buried infrastructure. Any chemical attacks would take considerable time before damaging the integrity of the constructed environment. But without knowledge of the water chemistry and the geochemical

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environment, the design and construction of the various freeway segments might not be appropriate.

- The possibility that dewatering could be used to maintain safe and dry excavation conditions, and ongoing operation, was mentioned in both of the reviewed reports. However, options for disposing the extracted groundwater such as to local surface water systems (creek, wetlands, ponds, etc), discharge into stormwater drains or into sewers systems, or reinjected back into aquifers (aquifer recharge commonly referred to as “managed aquifer recharge”) were not mentioned. Likewise, the need to assess pre-disposal treatment options based on the chemical characteristics of the pumped groundwater and chemical compatibility with “receiving waters” was not mentioned.

Groundwater extraction would need to be licensed by Southern Rural Water (SRW); aquifer recharge by SRW and the Victorian Environmental Authority (EPA); discharge into sewers by the appropriate urban water authority or local council, respectively, and direct release to the environment would be subject to a discharge licence by the EPA and approval by Melbourne Water.

- The possibility that accidental spills of fuel and other chemicals releases from vehicles and equipment could occur was not mentioned in the reviewed reports. Contingency plans in the event of accidental releases to the environment need to be developed and included in a project specific Environmental Management Plan.
- The potential for Occupation & Health issues if contaminated groundwater is intersected, flows passively into construction areas, or is induced into work areas by dewatering was not mentioned in either of the reviewed reports. The potential for O&H issues associated with any groundwater contamination and appropriate responses to protect the health of works should be included in a groundwater contamination investigation and assessment report, and in the Groundwater Management Plan.
- Neither the Hydrogeology Report nor the EPBC Referral document detailed descriptions of what works would be undertaken to provide data for detailed assessment of ground and hydrogeological conditions for use in designing the different NEL freeway segments, and for assessing the potential for adverse impacts on high value environmental features such as Bolin Bolin Billabong, Yarra River, Koonung Creek, Glass Creek or the Banyule Flats.
- The reviewed reports did not include any Risk of Harm analysis that could be used to ascertain whether the construction phase and post construction phase risks are acceptable or not.
- The need to identify local groundwater users and to ascertain whether any works/activities associated with the proposed NEL link would cause unacceptable drawdown interference should be ascertained. As with potential adverse environmental impacts, measure to mitigate any unacceptable drawdown interference should be developed.
- The Hydrogeology report noted the occurrences of Groundwater Dependent Ecosystems (GDEs) associated with the main waterways throughout the study area, ... *“i.e. terrestrial and riparian vegetation may be dependent upon groundwater, e.g. areas within the floodplain of the Yarra River (Banyule Wetlands, Bolin Bolin*

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Billabong), Banyule Creek, and Koonung Creek, as mapped in the National Groundwater Dependent Ecosystem Atlas (BOM, 2012)." However, Figures showing the mapped extent of the GDEs were not provided. — I downloaded the mapped terrestrial and aquatic GDE layers from the Bureau of Meteorology Groundwater Dependent Ecosystems Atlas (interactive website accessed February 2018; URL provided below). Georeferenced maps of the two GDE layers are presented in Figures 3 and 4, to illustrate the significant extent of GDEs in close proximity to the proposed NEL.

(<http://www.bom.gov.au/water/groundwater/gde/map.shtml>)

GHD (2017) stated that ... *"Further information on the EPBC Act-listed ecological communities identified in the vicinity of the project is provided in the Ecology report (Attachment D to this referral). In summary, no EPBC Act-listed groundwater dependent communities or species were identified within the referred project area."* I did not verify these statements as they are outside of my expertise.

REVIEW CONCLUSION

As mentioned in the reviewed reports the NEL design (and presumably geotechnical and hydrogeological investigations) is ongoing. Consequently, only general comments on potential adverse impacts could only be provided

The City of Boroondara (and other stakeholders) should ensure that appropriate measures to mitigate unexpected as well as expected adverse impacts are fully developed and practicable, and can be readily implement, if required. The City of Boroondara should also seek assurance that any required long-term mitigation measure will be funded for the life of the NEL.

Detailed technical reports, engineering reports and the Groundwater Management Plan should be reviewed to ensure that all aspects of the design and construction of the freeway, and measures to mitigate unacceptable environmental other impacts are appropriate and that all residual risks of harm are acceptable.

Yours sincerely



February 2017

John Leonard
Senior Principal
JOHN LEONARD CONSULTING SERVICES

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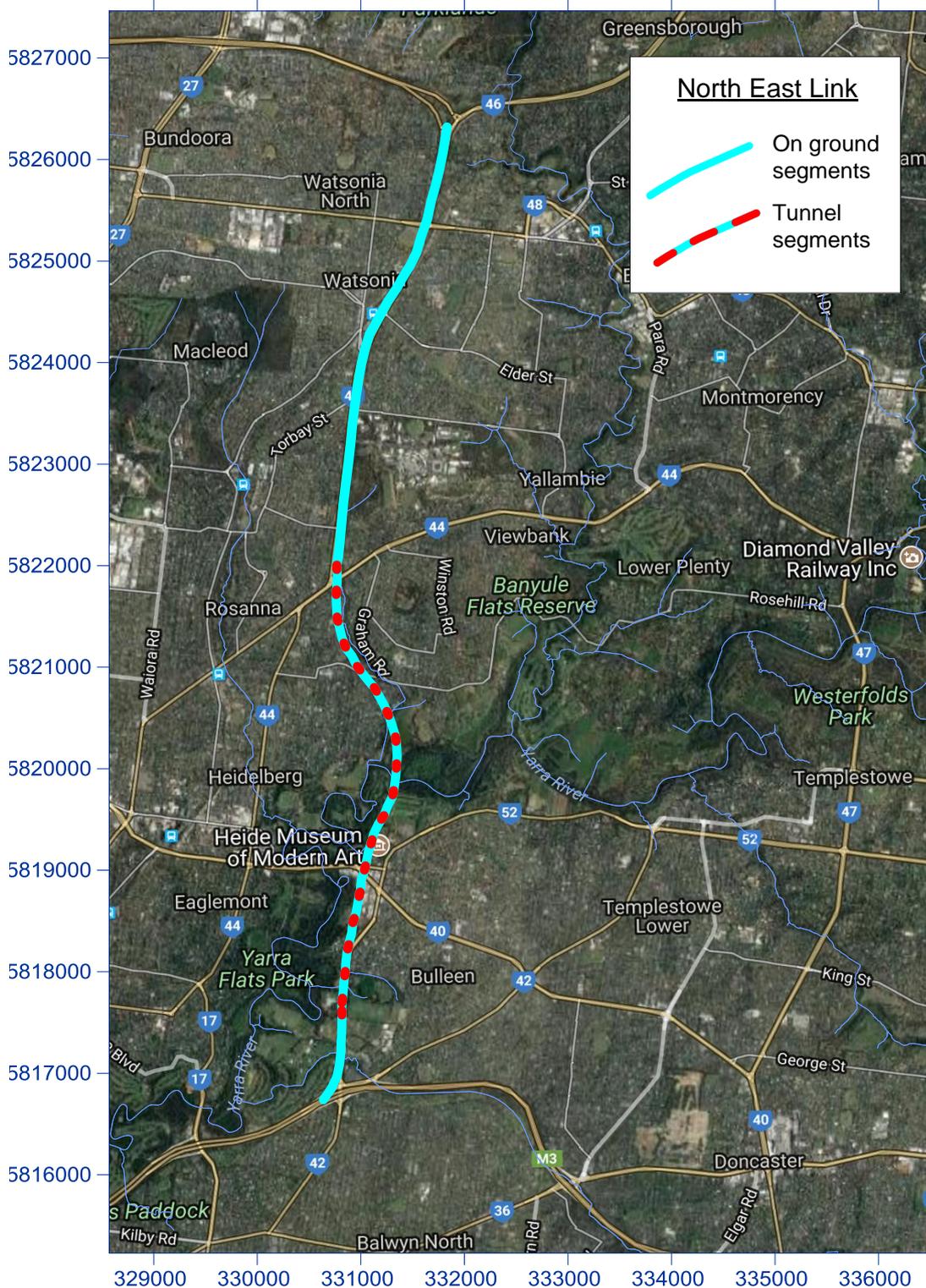
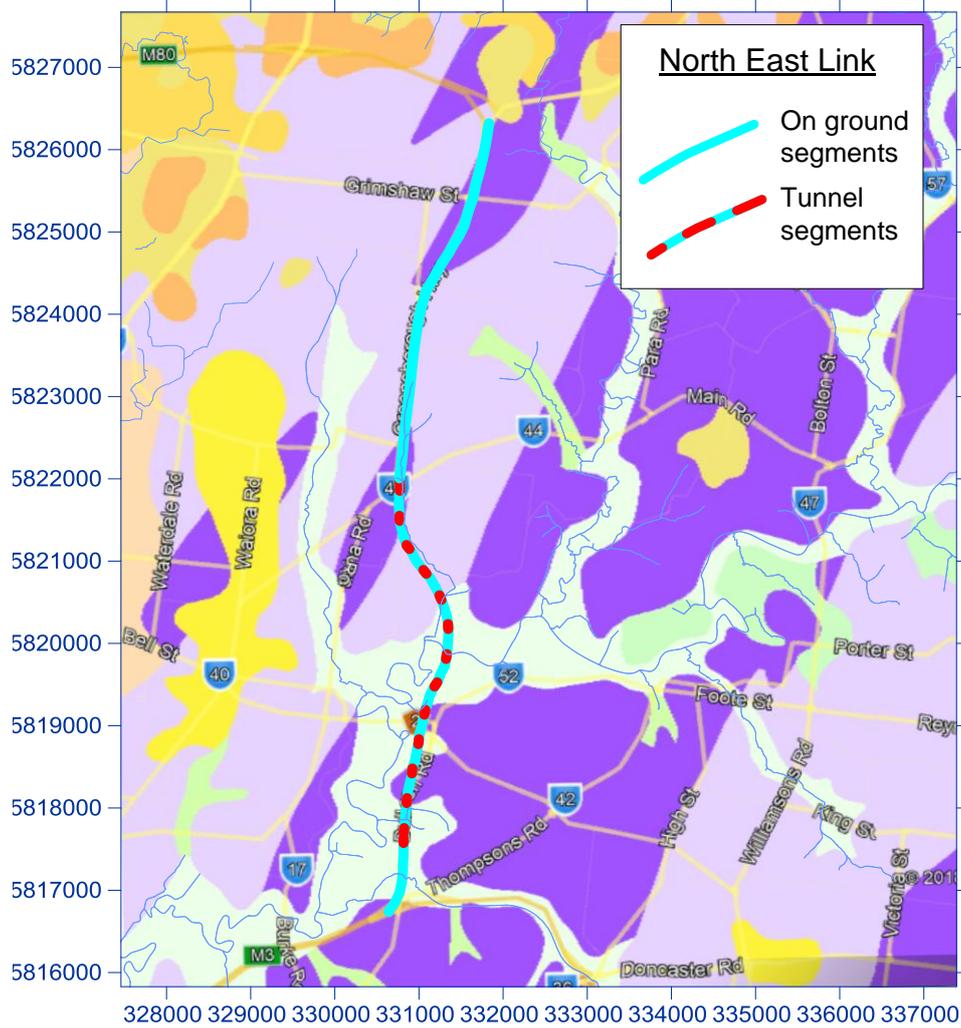


FIGURE 1 Proposed North East Link Alignment

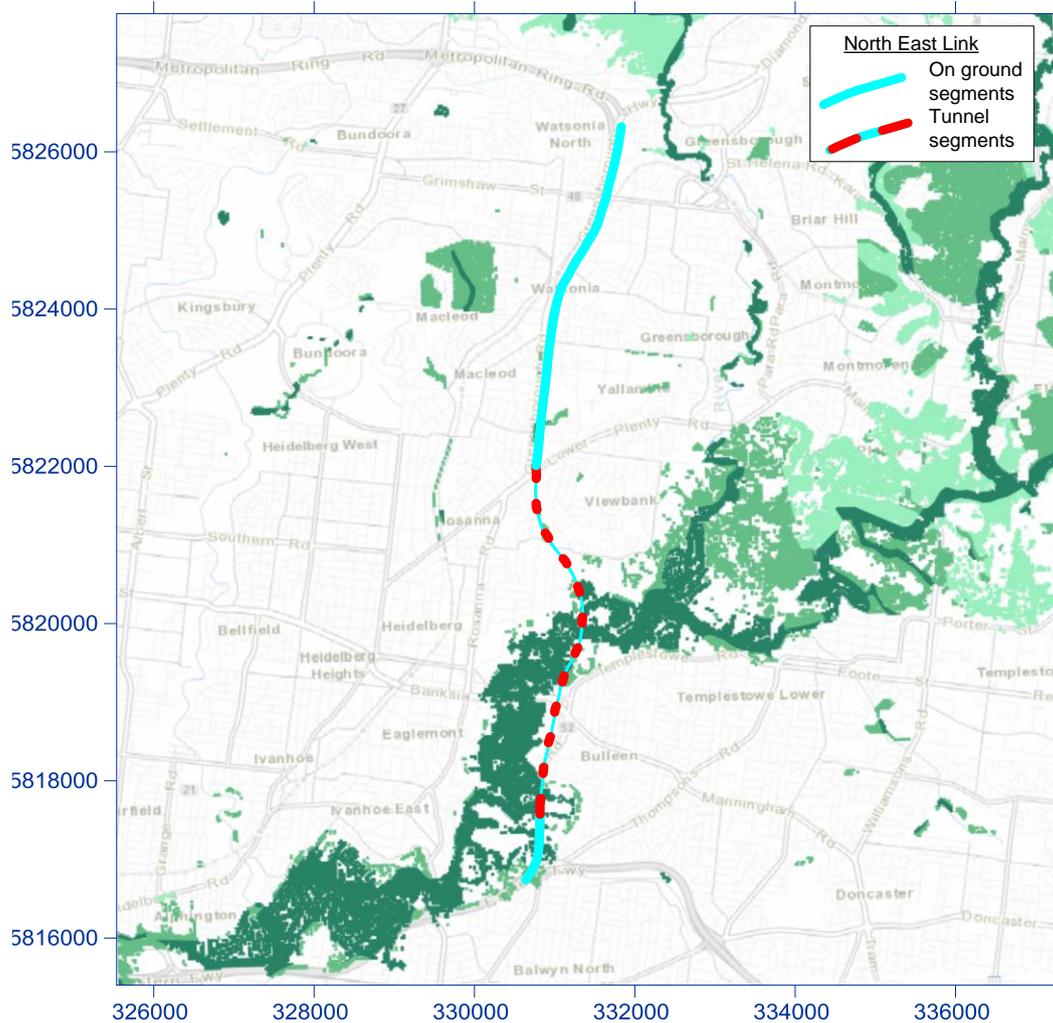
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| | | | |
|----------------------|--|---|---|
| Pliocene to Holocene | | Alluvium (unnamed) | Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes low terraces and alluvial floodplain deposits |
| Pliocene to Holocene | | Colluvium (unnamed) | Gravel, sand, silt, clay, rubble: sorting variable, usually poor; includes channel deposits with better rounding and sorting |
| Miocene to Pliocene | | Brighton Group | Sandstone, conglomerate: fine to coarse-grained, massive to well bedded; cross-bedded; local ironstone |
| Miocene | | Greensborough Basalt (Newer Volcanic Group) | Basalt: blue-grey; phenocrysts of olivine in groundmass of titanite, labradorite laths, pyroxene, iron oxide, interstitial glass; olivine partly altered to serpentine. |
| Silurian | | Melbourne Formation | Siltstone and sandstone: mainly thin-bedded; most beds show undisturbed Bouma sequences. |
| Silurian | | Anderson Creek Formation | Sandstone: thick to thin bedded; siltstone, minor conglomerate |

FIGURE 2 Outcrop Geology

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Terrestrial GDE

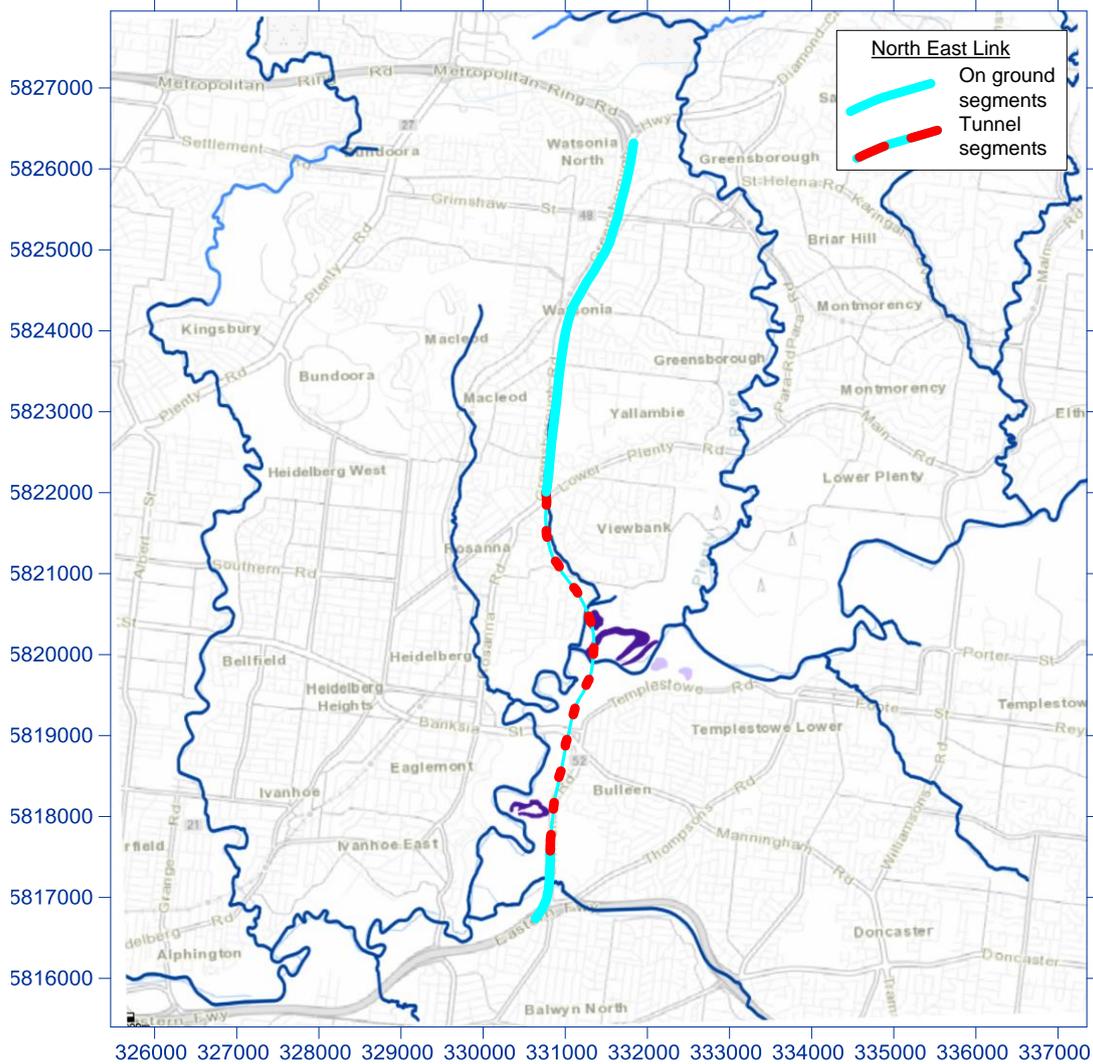
- Known GDE - from regional studies
- High potential GDE - from regional studies
- Moderate potential GDE - from regional studies
- Low potential GDE - from regional studies
- Unclassified potential GDE - from regional studies
- High potential GDE - from national assessment
- Moderate potential GDE - from national assessment
- Low potential GDE - from national assessment
- Unclassified potential GDE - from national assessment

Terrestrial GDE (no data)

- No ecosystems analysed

FIGURE 3 Terrestrial Groundwater Dependent Ecosystems (source BoM Groundwater Dependent Atlas; accessed February 2017)

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Aquatic GDE

- Known GDE - from regional studies
- High potential GDE - from regional studies
- Moderate potential GDE - from regional studies
- Low potential GDE - from regional studies
- Unclassified potential GDE - from regional studies
- High potential GDE - from national assessment
- Moderate potential GDE - from national assessment
- Low potential GDE - from national assessment
- Unclassified potential GDE - from national assessment

FIGURE 4 Aquatic Groundwater Dependent Ecosystems (source BoM Groundwater Dependent Atlas; accessed February 2017)



DAVID HODGETT MP

Member for Croydon
Deputy Leader of the Opposition

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21 December 2017

Cr Jim Parke
Mayor
Boroondara Council
Private Bag 1
CAMBERWELL VIC 3124

Dear Mayor Parke,

Thank you for your letter outlining your concerns with the proposed North East Link, in particular corridor option A.

The Coalition is strongly of the view that the government-led development of this project to date has been a rushed, opaque and ill-considered process. This particularly includes matters relating to community consultation and the ultimate route selection.

The North East Link in its current form will do little to alleviate traffic congestion on the Eastern Freeway. Indeed, widening the Eastern Freeway, as proposed as part of this project, will be insufficient in accommodating the estimated 100,000-plus additional vehicles the North East Link is expected to funnel onto it each day. This situation is especially concerning given the bottlenecks that exist on either end of the Eastern Freeway – which reinforces the recklessness of Daniel Andrews' decision to tear up the East West Link contract at a \$1.3 billion cost to taxpayers.

To this end, whilst the Coalition has always agreed that the North East Link is a project vital for Melbourne's future, we have been consistent in stating that in order for it to work, it is essential that the East West Link is built first so as to provide maximised traffic flow and efficiency. The Andrews Government has also failed to properly engage with the Federal Government regarding Federal funding for the North East Link's inexplicable \$16.5 billion price tag while, conversely, \$3 billion in Federal funding remains available for the first Victorian Government that commits to building the East West Link.

I also acknowledge your specific concerns regarding corridor option A, and the potentially significant social and environmental impacts on areas of your municipality arising from it. Whilst all route options for the North East Link will inevitably result in such impacts, we would agree the Andrews Government's consultation with the community and other stakeholders has been totally inadequate in both determining a final route and properly assessing ways to minimise these impacts.



The Coalition will continue to assess stakeholder feedback and advocate for making sure we get this project right and we will continue to develop our position in this context over the coming months as we move closer to the election.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'David Hodgett', with a stylized flourish at the end.

David Hodgett MP
Member for Croydon
Deputy Leader of the Opposition
Shadow Minister for Roads & Infrastructure
Shadow Minister for Ports & Freight



**Hon
Bruce Atkinson
MLC**

**MEMBER FOR
EASTERN
METROPOLITAN
REGION**

**PRESIDENT
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Friday, 12 January 2018

Cr J Parke
Mayor
Boroondara City Council
Private Bag 1
CAMBERWELL VIC 3124



Dear Cr Parke

I wish to acknowledge and thank the Council for its advice of December 6th 2017 in respect of the municipality's view of the alignment announced by the State Government for the North East Link.

As your Council would be well aware, the timeframe the Government allowed for community consultation was very short and it would seem that Option One was the only route in serious contention.

Furthermore, the consultation process did not provide local municipalities, Members of Parliament or the community with detailed information, including cost estimates and traffic modelling, which would allow assessment of the impact of each of the routes.

The State Government claims a number of benefits for the North East Link project including relief for some local roads from trucks and other through traffic, a faster journey time from northern suburbs to the eastern and south eastern suburbs and an increase to the capacity of the Eastern Freeway.

However, there are obviously impacts on Boroondara as outlined in your resolution of November 27th.

I am particularly concerned about the impact of this project on residents and community facilities within the proposed alignment of the road and both cost and construction management as well as commitments to enhanced public transport options.

Further, I am concerned about the traffic implications for the Eastern Freeway and inner city areas without the East West link that the current Government scrapped at a cost of \$1.2 billion and the credibility of the assurance that there will be no tolls on the M80, Eastern Freeway or local roads.

I will discuss your concerns with colleagues and inform them of your Council's preference for the third option in terms of an alignment for the North East Link.

Yours sincerely

Hon Bruce Atkinson MLC
Member for Eastern Metropolitan Region
President of the Legislative Council
Parliament of Victoria

Hon. Peter Walsh MP

Member for Murray Plains | Leader of The Nationals

15th December 2017

Mr Cr Jim Parke
Private Bag 1
Camberwell
VIC 3124

Dear Cr Parke

North East Link report

I refer to previous correspondence regarding the North East Link report discussed at the 27 November 2017 Ordinary Council Meeting.

Thank you for bringing this issue to my attention.

Yours sincerely

A handwritten signature in blue ink that reads "Peter Walsh".

PETER WALSH MP
Member for Murray Plains
Shadow Minister for Agriculture
Shadow Minister for Regional Victoria and Decentralisation

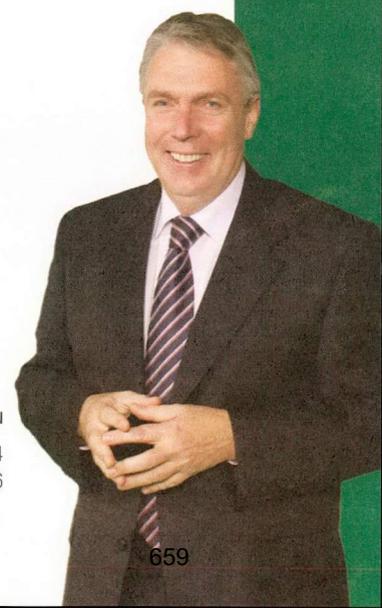
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State Member of Parliament for Eastern Metropolitan Region

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From the Office of Samantha Dunn MLC



Tuesday 19 December 2017

Mayor Jim Parke
 City of Boroondara
 Private Bag 1
 Camberwell VIC

Dear Mayor Parke

The proposed North East Link toll road

Thank you for your letter dated 6 December 2017 regarding the proposed North East Link toll road.

The Victorian Greens oppose this toll road. Indeed, the Victorian Greens oppose all four of the options (A, B, C and D) originally presented, including the route that has been selected by the State Government. The Victorian Greens have no preferred corridor option, it is our view there is no preferable corridor. Regardless of the route, this proposed project will have a hugely deleterious impact on amenity of neighbouring suburbs, the loss of greenspace, the entrenchment of private motor vehicle dependency and lead to an increase in air pollution.

Instead of wasting taxpayer's funds on a toll road, the Victorian Greens would prefer resources are directed to:

- Upgrade of the Hurstbridge metro line, including track duplication from Greensborough to Eltham and removing all remaining level crossings.
- Upgrade of the South Morang/Mernda metro line, including removing all level crossings, to provide residents in the northern suburbs an alternative to commuting to work instead of using their private motor vehicle.
- A network wide upgrade to high capacity signalling: our public transport system is currently bottlenecked by out-dated train signalling. Upgrading to high capacity signalling will allow for more frequent trains, greatly increasing the capacity of the network.
- Doncaster Bus Rapid Transit: a dedicated bus way down the median of the Eastern Freeway. This can transport twice as many people during the morning peak as the existing bus services, getting thousands of cars off the Freeway. This service can be built in 2-3 years and would be a precursor to Doncaster Heavy Rail. It does not need to wait 10 years for a \$16.5 billion toll road to be built.

- Doncaster Heavy Rail: transporting up to 15,000 people per hour each way in the peak, and taking the pressure of the Eastern Freeway. That's more than 20,000 cars off the Eastern Freeway in the morning peak.
- Extend the Route 86 Tram: an extension from La Trobe University to South Morang Station will give students and staff an alternative to driving.
- Better bus timetabling: smarter buses that better connect with other transport options and provide live timetable updates.
- More feeder bus services: more services more frequently, to get people to the train station without needing a car.
- New electric buses: for a smoother, quieter and cleaner ride. No more broken down buses on the Eastern Freeway and Hoddle Street.
- Improved bike facilities: Greater availability of bike cages at stations and providing bike racks on the front of buses.
- Moving freight from roads to rail, including through building the already-funded Port Rail Shuttle, and facilitating private investment in intermodal freight hubs.
- Fixing local roads that needs to be addressed now, not in 10 years' time. Chief amongst them are Rosanna Road and duplication of Warrandyte Bridge.

I note that the Andrews Government appears determined to build the now announced route (Option A). I would suggest that the continuing debate on which option is preferable simply plays to the political plan of the Andrews Government to pit local communities against each other in a classic divide and conquer manoeuvre. The Victorian Greens will continue to prosecute a campaign against the proposed North East Link toll road, and invite all local councils and community groups to join us in stopping this toll road altogether.

Yours Sincerely



Samantha Dunn

Member for Eastern Metropolitan Region

Greens spokesperson on the North East Link



Fiona Patten MLC

NORTHERN METROPOLITAN REGION



Mayor Jim Parke
City of Boroondara
Private Bag 1
CAMBERWELL 3124



19 December 2017

Dear Jim

Thank you for writing to me in relation to the North East Link and congratulation on your election.

I appreciate that the government's announcement that the North East Link project will be constructed along proposed Corridor A, is of concern to your residents.

Infrastructure project of this size will have impacts. Clearly, this will be challenging and distressing for many, particularly those affected by compulsory acquisitions.

In discussion with the Minister and North East Link Authority, it was plain that each of the four proposed corridors had advantages and disadvantages.

On balance, I accept the Premier's conclusion that Corridor A was the strongest model. This also reflects the views of many of my constituents in the Northern Metropolitan Region.

On this basis, I unfortunately cannot add my support to your specific resolution. However, I am very happy to continue to raise issues with government and find solutions where we can. The devil and opportunity sometimes lie in the detail.

I thank you once again for raising this matter with me.

Yours faithfully

Fiona Patten MP

Fiona Patten MLC

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