Appendix D. Assessment of Significant Impact Criteria under the EPBC Act.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999– Assessment of Significant Impact Criteria for Coastal Swamp Sclerophyll Forest of New South Wales and Southeast Queensland	
EPBC Act Status: Endangered	
Significant Impact Criteria **An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:**	
▪ **Reduce the extent of an ecological community;**	The proposed activity will not result in very low impacts to the Coastal Swamp Sclerophyll Forest mapped within the Subject Land. Vegetation to be impacted characteristic of the EEC is planted and of low value within the area. Subject to mitigation measures, no other areas of vegetation will be impacted by the proposal. It is therefore not considered likely that the extent of the ecological community will be reduced.
▪ **Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;**	Coastal Swamp Sclerophyll Forest within the area is already fragmented due to the urban nature of the landscape. No increased fragmentation will occur, and connectivity is expected to remain the same extent within the Subject Land.
▪ **Adversely affect habitat critical to the survival of an ecological community;**	Minimal Coastal Swamp Sclerophyll Forest requires removal to facilitate the works (31 trees 0.09ha). Subject to mitigation measures, it is considered unlikely that the proposed activity would adversely affect habitat critical to the survival of this community.
▪ **Modify or destroy abiotic (non-living) factors (such as water, nutrients or soil) necessary for an ecological community's survival including reduction of groundwater levels or substantial alteration of surface water drainage patterns;**	It is not expected that the proposed activity will modify or destroy abiotic factors (such as water, nutrients, or soil) that is necessary for the survival of this ecological community. No reduction in groundwater levels, or substantial alterations of surface water drainage patters are anticipated as a result of the proposed activity.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999– **Assessment of Significant Impact Criteria for Coastal Swamp Sclerophyll Forest of New South Wales and Southeast Queensland**	
EPBC Act Status: Endangered	
▪ **Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting;**	The proposed activity will require clearing of 0.09ha of Coastal Swamp Sclerophyll Forest. The 0.09ha of vegetation to be removed are all exceedingly common native canopy species; (*Angophora costata, Melaleuca quinquenervia, Eucalyptus spp., Melaleuca styphelioides, Casuarina glauca, Corrymbia maculata*). These species do not contribute to unique species compositions of this EEC. It is considered unlikely that the proposal will cause a substantial change in the species composition of the occurrence of the ecological community.
▪ **Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:** **i. assisting invasive species, that are harmful to the listed ecological community, to become established** **ii. causing regular mobilisation of fertilisers, herbicides, or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community;**	The proposed activity will not cause a substantial reduction in the quality or integrity of the occurrence of this EEC. i. The proposed activity will not assist invasive species to become established as the Coastal Swamp Sclerophyll Forest, subject to appropriate management. No harmful, invasive species were identified within the Subject Land; and ii. The proposed activity is not expected to cause the regular mobilisation of fertilisers, herbicides, or other chemicals or pollutants.
▪ **Interfere with the recovery of an ecological community.**	It is not anticipated that the proposed activity will interfere with the recovery of the EEC. The anticipated impacts are both minimal and highly insignificant in the context of the surrounding landscape. Appropriate habitat for the EEC will remain available in the broader locality. As such, it is not expected that the proposed activity will interfere with the recovery of this ecological community.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999– Assessment of Significant Impact Criteria for Coastal Swamp Sclerophyll Forest of New South Wales and Southeast Queensland
EPBC Act Status: Endangered
Conclusion There will be no significant impact on the ecological community therefore the proposed action should not warrant the producing of a Species Impact Statement (SIS) or Biodiversity Development Assessment Report (BDAR).

www.ececology.com.au

Greater Sydney | Canberra | South Coast | Central Coast

Shane Lauger

From: James Tsom
Sent: Monday, 24 February 2025 5:49 PM
To: Richard James
Cc: Stephen Leung; Shane Lauger
Subject: RE: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Hi Richard, Stephen and Shane,

I apologise for the delay in responding to your requests with regards to this project.

I have reviewed the information provided in emails from Shane dated 14-11-2024, 21-2-2025, 21-2-2025 and provide the following flood related comments for each site location below.

1. **George Kendall Riverside Park, Ermington** – The cycleway at this location is shown to be outside of the main Parramatta River for the 1% AEP event flood inundation area but is partly impacted by local overland flooding from the local catchment as shown on attached map. Click this link to the flood inundation map, hydraulic flood hazard map and stormwater drainage network map for this area.

   The level of the cycleway will need to be designed and constructed so that it does not cause obstruction of the local overland flow paths. Drainage inlet pits and pipes crossing the path will also need to be installed at low points to ensure cycleway is kept dry from any potential surface seepage flows upstream.

   I did not come across design drawings showing cross sections of the cycleway for George Kendall reserve.

2. **Rangihou Reserve, Parramatta –** This location is shown to be impacted by the 1% flood event. Click this link to the flood inundation map, hydraulic flood hazard map and stormwater drainage network map for this area. Please also note that there is additional stormwater road drainage in the new section of Morton Street roadway which was delivered by the developer but not shown in our GIS map at this stage.

   Due to low levels in the new Morton Street section of road it is important that the existing height of the cycleway path be maintained. The new cycleway expansion will need to consider the existing flooding at this location to ensure that its design and construction does not result in an increase of flooding in Morton Street. Existing flood hazard conditions at this location vary from H3 to H5 which are dangerous for pedestrians and cyclists. It is recommended that appropriate Flood Warning signs be installed along this cycleway and path to provide awareness to uses informing that cycleway and path not be used during heavy rain or flooding. Signs also need to be installed direct users to higher ground.

   Any adjustment of the existing stormwater inlet grates to match new pathway levels need to be checked by hydraulic modelling to ensure low areas of reserve adjacent to Morton Street do not trap floodwater.

   A check of proposed levels between approx. CH 53 to CH 178, CH 204 to CH 286 and CH 338 to CH 373 needs to be made to address how potential low areas upstream of the cycleway path will drain. Details of any required pit and pipe drainage needs to be included in construction drawings.

3. **Reid Park Valley, Rydalmere –** This location is shown to be impacted by the 1% flood event. Click this link showing the flood inundation map, hydraulic flood hazard map and stormwater drainage network map for this area. Existing flood hazard conditions at this location vary from H3 to H4 which are dangerous for pedestrians and cyclists. It is recommended that appropriate Flood Warning signs be installed along this cycleway and path to provide awareness to uses informing that cycleway and path not be used during heavy rain or flooding. Signs also need to be installed direct users to higher ground.

   Drainage modelling and hydraulic checks on low sag areas is required to ensure adequate drainage is provided to prevent flood to adjacent properties. All pit and pipe drainage to be design for a 5% ARI design event plus climate change and to appropriate safe overland flow paths provided for the 1% AEP event plus climate change. Particular attention should be made to cross section areas between CH 0 to CH 50, CH 90 to CH 135, CH 150 to CH 180. Drainage design details need to be included in construction drawings.

4. **Royal Shores, Ermington –** This area is affected by flooding from Parramatta River in the 1% AEP event for the full length of the proposed cycleway area. It is also impacted by local overland flooding from the local tributary channels and drainage systems connecting to Parramatta River. Click this link for the flood inundation map, hydraulic flood hazard map and stormwater drainage network map for this area. High hazard flow condition from the tributary areas crossing the cycleway. Hydraulic hazard flows vary from H2 to H5. It is recommended that Flood Warning signs be location along the cycleway path particularly either side of these tributary bridge crossing areas to warn users of the dangerous flood hazard conditions and advise that cycleway should not be used during heavy rain or during flood events. Directional sign showing path to higher ground should also be installed.

   I did not come across design drawings showing cross sections of the cycleway for the Royal Shores reserve area.

5. **Baludarri Wetlands, Parramatta. –** I understand that footpath lighting only is being installed in this area. This area is impacted by flooding from the Parramatta River in the 1% AEP event. Click this link for the flood inundation map, hydraulic flood hazard map and stormwater drainage network map for this area. It is also recommended that Flood Warning signs be installed in this area and signage provided to direct users of the cycleway to higher ground.

The flood inundation and hydraulic flood hazard areas are based on the Council adopted June 2024 Parramatta River Flood Study.

We can also provide you with flood levels for these locations, if required. Please let know if you also need the flood levels and I will request Peter Sirianni to provide.

Please let me know if you have any questions with regards to the above.

Regards,

James Tsom
Supervisor Catchment Management | Catchment Management
02 9806 8255 | 0414 190 265

City of Parramatta
316 Victoria Road, Rydalmere NSW 2116 Australia
PO Box 32, Parramatta, NSW 2124
cityofparramatta.nsw.gov.au

Council acknowledges the Traditional Owners of the land, the Dharug Peoples and pays respect to their Elders past and present.

From: Richard James <RJames@cityofparramatta.nsw.gov.au>
Sent: Friday, 14 February 2025 9:00 AM
To: James Tsom <JTsom@cityofparramatta.nsw.gov.au>
Cc: Stephen Leung <sleung1@cityofparramatta.nsw.gov.au>
Subject: FW: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Hi Jim,

The Eastern Parramatta River & CBD Precinct Cycleway Team are keen to receive your comments so that this project can progress.

This is a West Invest Project, of which we are on tight deadlines.

Seeking your earliest comments please.

Richard James
Group Manager Capital Projects Delivery | Capital Projects
02 9806 8222 | 0403 346 002

City of Parramatta
316 Victoria Road, Rydalmere NSW 2116 Australia
PO Box 32, Parramatta, NSW 2124
cityofparramatta.nsw.gov.au

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From: Stephen Leung <sleung1@cityofparramatta.nsw.gov.au>
Sent: Thursday, 13 February 2025 3:34 PM
To: Richard James <RJames@cityofparramatta.nsw.gov.au>
Cc: Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>
Subject: FW: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Hi Richard,

Would you mind following up with Jim about his review of the concept designs for Eastern River Cycleway. We need advice on whether the proposed works will have any impacts to the flood levels in the area, and if so, what the mitigation measures might be.

Regards,

Stephen Leung
Supervisor Projects | City Assets and Operations
(02) 9843 8043 | 0492 483 742

City of Parramatta
316 Victoria Road, Rydalmere NSW 2116
PO Box 32, Parramatta, NSW 2124
cityofparramatta.nsw.gov.au

From: Stephen Leung
Sent: Friday, 31 January 2025 11:30 AM
To: James Tsom <JTsom@cityofparramatta.nsw.gov.au>
Cc: Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>
Subject: RE: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Hi Jim,

Just following up on this one please. Just after some comments on the concept designs. We don't believe there is any significant risk with the installation of new cycleway / increase in width of the existing pathways for this project, and so don't expect any material changes will be required to the design. If this is the case, we just need a statement stating this from your team, similar to what was received for Silverwater Park: 6. Flood Advice.msg.

Can you please get back to us at your earliest convenience?

Regards,

Stephen Leung
Supervisor Projects | Projects
02 9843 8043 | 0492 483 742

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PO Box 32, Parramatta, NSW 2124
cityofparramatta.nsw.gov.au

Council acknowledges the Traditional Owners of the land, the Dharug Peoples and pays respect to their Elders past and present.

From: Stephen Leung
Sent: Thursday, 9 January 2025 4:10 PM
To: Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>; James Tsom <JTsom@cityofparramatta.nsw.gov.au>
Cc: John Graham <JGraham@cityofparramatta.nsw.gov.au>; Darren Huynh <dhuynh@cityofparramatta.nsw.gov.au>; Justin Wannenburg <jwannenburg@cityofparramatta.nsw.gov.au>
Subject: RE: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway
Importance: High

Hi Jim,

Hoping you're having a nice New Years break.

When you return to the office, can you please prioritise the review of the plans for Eastern Parramatta River Cycleway and provide commentary on whether there is a potential for any flood impacts? We need to have our plans completed shortly to stay on program and meet our funding commitments with the State Government.

Below is advice that your team gave for minor upgrades to Silverwater Park: 6. Flood Advice.msg. This type of advice is all we are after.

If there is a potential for issues, we just need to know what can be done to mitigate the impacts, i.e. warning signage.

Regards,

Stephen Leung
Supervisor Projects | Projects
02 9843 8043 | 0492 483 742

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From: Stephen Leung <sleung1@cityofparramatta.nsw.gov.au>
Sent: Thursday, 19 December 2024 12:11 PM
To: Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>; James Tsom <JTsom@cityofparramatta.nsw.gov.au>
Cc: John Graham <JGraham@cityofparramatta.nsw.gov.au>; Darren Huynh <dhuynh@cityofparramatta.nsw.gov.au>; Justin Wannenburg <jwannenburg@cityofparramatta.nsw.gov.au>
Subject: RE: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Hi Jim,

Just wondering if you've had a chance to review these plans? Understanding we only have tomorrow until the break, when do you think you can provide us with comments to consider in our designed design?

Regards,

Stephen Leung
Supervisor Projects | Projects
02 9843 8043 | 0492 483 742

City of Parramatta
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PO Box 32, Parramatta, NSW 2124
cityofparramatta.nsw.gov.au

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From: Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>
Sent: Thursday, 14 November 2024 10:04 PM
To: James Tsom <JTsom@cityofparramatta.nsw.gov.au>
Cc: Stephen Leung <sleung1@cityofparramatta.nsw.gov.au>; John Graham <JGraham@cityofparramatta.nsw.gov.au>; Darren Huynh <dhuynh@cityofparramatta.nsw.gov.au>; Justin Wannenburg <jwannenburg@cityofparramatta.nsw.gov.au>
Subject: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Hi James,

Thanks for your time this afternoon for a quick chat.

Attached are the proposed pedestrian and cycleway across 5 different locations along the Eastern Parramatta River;

1. George Kendall Riverside Park, Ermington
2. Rangihou Reserve, Parramatta
3. Reid Park Valley, Rydalmere
4. Royal Shores, Ermington
5. Baludarri Wetlands, Parramatta. We are only installing footpath lighting at this location.

Please review and comment on the proposed concept plans.

Regards,
Shane Lauger
Project Manager | Capital Projects | City Assets and Operations

Tel: (02) 9806 8151 | Mob: 0434 854 854

City of Parramatta
316 Victoria Road, Rydalmere NSW 2116
PO Box 32, Parramatta, NSW 2124
cityofparramatta.nsw.gov.au

Shane Lauger

From: Shane Lauger
Sent: Friday, 9 May 2025 12:56 PM
To: Shane Lauger
Subject: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

---

From: Dariusz Juszczak <DJuszczak@cityofparramatta.nsw.gov.au>
Sent: Wednesday, 26 February 2025 3:52 PM
To: Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>; Justin Wannenburg <jwannenburg@cityofparramatta.nsw.gov.au>; John Graham <JGraham@cityofparramatta.nsw.gov.au>; Darren Huynh <dhuynh@cityofparramatta.nsw.gov.au>; James Tsom <JTsom@cityofparramatta.nsw.gov.au>; Raymond Chow <RChow@cityofparramatta.nsw.gov.au>
Cc: Stephen Leung <sleung1@cityofparramatta.nsw.gov.au>
Subject: RE: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Gents,

To check Jim's concerns, Raymond and I went on site this afternoon to double check if we will have potential problems with Justin's design.

After substantial walks and sweating, I can confirm that the design doesn't impact on the existing flooding conditions, as design follows up existing grades, it is not creating and low points. We are constructing and vertical obstructions.

Potential issue with a seepage is non-existent, as most of the paths are on higher ground and terrain is pretty level. While on site, we have not noticed any signs of the seepage problems, which leads us to assume that the site is relatively free of it, hence no problems.

The new drainage pits are placed in the correct positions at existing pipes to collect an excess of water that might be a nuisance for cyclist/pedestrians.

Details for the construction are CoPC standard one that we had no problems with yet.

I can probably understand Jim's concerns, as when look at the long sections, the difference between what's new and proposed may look a bit uncomfortable, however, when one looks at the exaggeration ratio, 1:10 that explains why it may look not very comforting.

My advice is to proceed with the procurement and construction process. If at the construction stage we identify any issues that may cause the problem, we'll address them on site with prompt advice to our chosen contractor.
I hope that this satisfies all flooding concerns.

As for the flooding signs, that's up to Jim, however, as Johnny has suggested, if time is of an issue, we can use standard warning signs that are freely available off the shelves.
If Jim wishes to have site, tailor suited signs, then maybe we should check with our sign shop if they have anything available that we used on previous projects.

I hope that this email, clears the situation and will move these projects forward for successful completion.

Regards

Dariusz Juszczak
Supervisor Civil Design | Civil Design
02 9806 8218 | 0414 980 696

City of Parramatta
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Council acknowledges the Traditional Owners of the land, the Dharug Peoples and pays respect to their Elders past and present.

From: Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>
Sent: Tuesday, 25 February 2025 9:11 AM
To: Justin Wannenburg <jwannenburg@cityofparramatta.nsw.gov.au>; John Graham <JGraham@cityofparramatta.nsw.gov.au>; Darren Huynh <dhuynh@cityofparramatta.nsw.gov.au>; Dariusz Juszczak <DJuszczak@cityofparramatta.nsw.gov.au>
Cc: Stephen Leung <sleung1@cityofparramatta.nsw.gov.au>
Subject: RE: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway
Importance: High

Hi All,

Please see below the comment from Jim regarding flood impact advise for your consideration and action.

1) **George Kendall Riverside Park, Ermington** – Please provide civil drawing with long sections and x-sections for Jim for further review.

2) **Rangihou Reserve, Parramatta** – Please note the comment below.

3) **Reid Park Valley, Rydalmere** – Please add Flood Warning signs and Flood evacuation route to higher ground. Provide drainage modelling and hydraulic checks on low sag areas. Do you know who can provide this?

4) **Royal Shores, Ermington** – Please provide civil drawing with long sections and x-sections for Jim for further review. Also, add Flood Warning signs.

5) **Baludarri Wetlands, Parramatta** – Please add Flood Warning signs and Flood evacuation route to higher ground.

@Dariusz Juszczak – Please advise who is taking over Eastern Parramatta River while Justin is on leave until May? Could you provide a drainage modelling service for Reid Park?

Regards,

Shane Lauger
Project Manager | City Assets and Operations
02 9806 8151 | 0434 854 854
City of Parramatta
316 Victoria Road, Rydalmere NSW 2116 Australia
PO Box 32, Parramatta, NSW 2124
cityofparramatta.nsw.gov.au

From: James Tsom <JTsom@cityofparramatta.nsw.gov.au>
Sent: Monday, 24 February 2025 5:49 PM
To: Richard James <RJames@cityofparramatta.nsw.gov.au>
Cc: Stephen Leung <sleung1@cityofparramatta.nsw.gov.au>; Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>
Subject: RE: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Hi Richard, Stephen and Shane,

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I have reviewed the information provided in emails from Shane dated 14-11-2024, 21-2-2025, 21-2-2025 and provide the following flood related comments for each site location below.

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   The level of the cycleway will need to be designed and constructed so that it does not cause obstruction of the local overland flow paths. Drainage inlet pits and pipes crossing the path will also need to be installed at low points to ensure cycleway is kept dry from any potential surface seepage flows upstream.

   I did not come across design drawings showing cross sections of the cycleway for George Kendall reserve.

2. **Rangihou Reserve, Parramatta –** This location is shown to be impacted by the 1% flood event. Click this link to the flood inundation map, hydraulic flood hazard map and stormwater drainage network map for this area. Please also note that there is additional stormwater road drainage in the new section of Morton Street roadway which was delivered by the developer but not shown in our GIS map at this stage.

   Due to low levels in the new Morton Street section of road it is important that the existing height of the cycleway path be maintained. The new cycleway expansion will need to consider the existing flooding at this location to ensure that its design and construction does not result in an increase of flooding in Morton Street. Existing flood hazard conditions at this location vary from H3 to H5 which are dangerous for pedestrians and cyclists. It is recommended that appropriate Flood Warning signs be installed along this cycleway and path to provide awareness to uses informing that cycleway and path not be used during heavy rain or flooding. Signs also need to be installed direct users to higher ground.

   Any adjustment of the existing stormwater inlet grates to match new pathway levels need to be checked by hydraulic modelling to ensure low areas of reserve adjacent to Morton Street do not trap floodwater.

A check of proposed levels between approx. CH 53 to CH 178, CH 204 to CH 286 and CH 338 to CH 373 needs to be made to address how potential low areas upstream of the cycleway path will drain. Details of any required pit and pipe drainage needs to be included in construction drawings.

3. **Reid Park Valley, Rydalmere –** This location is shown to be impacted by the 1% flood event. Click this link showing the flood inundation map, hydraulic flood hazard map and stormwater drainage network map for this area. Existing flood hazard conditions at this location vary from H3 to H4 which are dangerous for pedestrians and cyclists. It is recommended that appropriate Flood Warning signs be installed along this cycleway and path to provide awareness to uses informing that cycleway and path not be used during heavy rain or flooding. Signs also need to be installed direct users to higher ground.

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The flood inundation and hydraulic flood hazard areas are based on the Council adopted June 2024 Parramatta River Flood Study.

We can also provide you with flood levels for these locations, if required. Please let know if you also need the flood levels and I will request Peter Sirianni to provide.

Please let me know if you have any questions with regards to the above.

Regards,

James Tsom
Supervisor Catchment Management | Catchment Management
02 9806 8255 | 0414 190 265

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PO Box 32, Parramatta, NSW 2124
cityofparramatta.nsw.gov.au

CITY OF PARRAMATTA

Council acknowledges the Traditional Owners of the land, the Dharug Peoples and pays respect to their Elders past and present.

From: Richard James <RJames@cityofparramatta.nsw.gov.au>
Sent: Friday, 14 February 2025 9:00 AM
To: James Tsom <JTsom@cityofparramatta.nsw.gov.au>
Cc: Stephen Leung <sleung1@cityofparramatta.nsw.gov.au>
Subject: FW: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Hi Jim,

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This is a West Invest Project, of which we are on tight deadlines.

Seeking your earliest comments please.

Richard James
Group Manager Capital Projects Delivery | Capital Projects
02 9806 8222 | 0403 346 002

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PO Box 32, Parramatta, NSW 2124

cityofparramatta.nsw.gov.au

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Sent: Thursday, 13 February 2025 3:34 PM
To: Richard James <RJames@cityofparramatta.nsw.gov.au>
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Subject: FW: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Hi Richard,

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Regards,

Stephen Leung
Supervisor Projects | City Assets and Operations
(02) 9843 8043 | 0492 483 742

City of Parramatta
316 Victoria Road, Rydalmere NSW 2116
PO Box 32, Parramatta, NSW 2124
cityofparramatta.nsw.gov.au

From: Stephen Leung
Sent: Friday, 31 January 2025 11:30 AM
To: James Tsom <JTsom@cityofparramatta.nsw.gov.au>
Cc: Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>
Subject: RE: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

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Regards,

Stephen Leung
Supervisor Projects | Projects
02 9843 8043 | 0492 483 742

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From: Stephen Leung
Sent: Thursday, 9 January 2025 4:10 PM
To: Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>; James Tsom <JTsom@cityofparramatta.nsw.gov.au>
Cc: John Graham <JGraham@cityofparramatta.nsw.gov.au>; Darren Huynh <dhuynh@cityofparramatta.nsw.gov.au>; Justin Wannenburg <jwannenburg@cityofparramatta.nsw.gov.au>
Subject: RE: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway
Importance: High

Hi Jim,

Hoping you're having a nice New Years break.

When you return to the office, can you please prioritise the review of the plans for Eastern Parramatta River Cycleway and provide commentary on whether there is a potential for any flood impacts? We need to have our plans completed shortly to stay on program and meet our funding commitments with the State Government.

Below is advice that your team gave for minor upgrades to Silverwater Park: 6. Flood Advice.msg. This type of advice is all we are after.

If there is a potential for issues, we just need to know what can be done to mitigate the impacts, i.e. warning signage.

Regards,

Stephen Leung
Supervisor Projects | Projects
02 9843 8043 | 0492 483 742

City of Parramatta
316 Victoria Road, Rydalmere NSW 2116 Australia
PO Box 32, Parramatta, NSW 2124
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CITY OF PARRAMATTA

Council acknowledges the Traditional Owners of the land, the Dharug Peoples and pays respect to their Elders past and present.

From: Stephen Leung <sleung1@cityofparramatta.nsw.gov.au>
Sent: Thursday, 19 December 2024 12:11 PM
To: Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>; James Tsom <JTsom@cityofparramatta.nsw.gov.au>
Cc: John Graham <JGraham@cityofparramatta.nsw.gov.au>; Darren Huynh <dhuynh@cityofparramatta.nsw.gov.au>; Justin Wannenburg <jwannenburg@cityofparramatta.nsw.gov.au>
Subject: RE: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Hi Jim,

Just wondering if you've had a chance to review these plans? Understanding we only have tomorrow until the break, when do you think you can provide us with comments to consider in our designed design?

Regards,

Stephen Leung
Supervisor Projects | Projects
02 9843 8043 | 0492 483 742

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PO Box 32, Parramatta, NSW 2124
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Council acknowledges the Traditional Owners of the land, the Dharug Peoples and pays respect to their Elders past and present.

From: Shane Lauger <SLauger@cityofparramatta.nsw.gov.au>
Sent: Thursday, 14 November 2024 10:04 PM
To: James Tsom <JTsom@cityofparramatta.nsw.gov.au>
Cc: Stephen Leung <sleung1@cityofparramatta.nsw.gov.au>; John Graham <JGraham@cityofparramatta.nsw.gov.au>; Darren Huynh <dhuynh@cityofparramatta.nsw.gov.au>; Justin Wannenburg <jwannenburg@cityofparramatta.nsw.gov.au>
Subject: Flood Impact Advise - Eastern Parramatta River & CBD Precinct Cycleway

Hi Jim,

Thanks for your time this afternoon for a quick chat.

Attached are the proposed pedestrian and cycleway across 5 different locations along the Eastern Parramatta River;

1. George Kendall Riverside Park, Ermington
2. Rangihou Reserve, Parramatta
3. Reid Park Valley, Rydalmere
4. Royal Shores, Ermington
5. Baludarri Wetlands, Parramatta. We are only installing footpath lighting at this location.

Please review and comment on the proposed concept plans.

Regards,
Shane Lauger
Project Manager | Capital Projects | City Assets and Operations
Tel: (02) 9806 8151 | Mob: 0434 854 854

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316 Victoria Road, Rydalmere NSW 2116
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Douglas PARTNERS

GROUNDED EXPERTISE

Report on Geotechnical Investigation

Proposed Pedestrian and Cycleway Upgrades

George Kendall Riverside Park, Ermington NSW

Prepared for City of Parramatta Council

Douglas Project 231248.00

17 January 2025

Douglas Partners Pty Ltd
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Document History

Details

Douglas Project No.	231248.00
Document Title	Report on Geotechnical Investigation
Site Address	George Kendall Riverside Park, Ermington NSW
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Filename	231248.00.R.005.Rev0_George Kendall

Status and Review

Status	Prepared by	Reviewed by	Date issued
Revision 0	Matthew Bobby	Stephen Jackson	17 January 2025

Distribution of Copies

Status	Issued to
Revision 0	Shane Lauger

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		17 January 2025
Reviewer	pp Stephen Jackson 	17 January 2025

Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

Table of Contents

Report on Geotechnical Investigation
Proposed Pedestrian and Cycleway Upgrades
George Kendall Riverside Park, Ermington NSW

1. Introduction

This report prepared by Douglas Partners Pty Ltd (Douglas) presents the results of a geotechnical investigation undertaken for proposed pedestrian and cycleway upgrades at George Kendall Riverside Park, Ermington NSW (the site). The investigation was commissioned by City of Parramatta Council (CoPC or Council) and was undertaken in accordance with Douglas' proposal 231248.00.P.001.Rev0 dated 22 August 2024.

The broader project is set to deliver 2.8 km of upgraded multi-use shared pathways along the Parramatta River at five locations across the suburbs of Parramatta, Rydalmere and Ermington. This current report specifically addresses the 350 m pathway section in George Kendall Riverside Park, Ermington. Reports are provided separately for the other pathway sections.

It is understood the proposed development within the George Kendall Riverside Park includes repairs to the existing 3 m wide pathway and conversion into a dedicated cycleway, a new 2 m wide pedestrian footpath offset from the existing pathway, with associated amenity upgrades and enhanced landscaping. Refer to Section 6 of this report for further details on the scope of the proposed upgrades.

The aim of the investigation was to assess the subsurface soil and groundwater conditions at selected locations of the site to provide comments and recommendations on the following:

- site preparation and earthworks;
- excavation conditions and batter slopes;
- acid sulfate soil risk;
- soil aggressivity; and
- design subgrade California bearing ratio (CBR) values for pavement design (by others).

The investigation included the drilling of eight boreholes, in-situ dynamic cone penetration (DCP) testing and laboratory testing of selected samples. The details of the field work are presented in this report, together with comments and recommendations on the items listed above. The report must be read in conjunction with all appendices including the notes provided in Appendix A.

2. Site Description

The site is located about 8.5 km east of the Parramatta CBD on the northern terraced bank of the Parramatta River. Topography within George Kendall Riverside Park is generally flat to mildly undulating, forming part of the lateral floodplain zone of the river. The site runs parallel to the river roughly east to west.

The George Kendall Riverside Park site is bounded by apartments and Broadoaks Street to the west, sporting fields and private residential dwellings to the north, a public reserve to the east, and the Parramatta River to the south.

The existing shared pathway is 3 m wide, of concrete construction and set back typically more than 15 m from the crest of the river bank. The concrete pavement segments appeared to be in reasonable condition with no significant cracking, loss of shape or major defects observed. The verges are generally grassed on both sides of the path, with well-established mature trees on the southern side of the path in the eastern part of the site.

The location of the site and nearby features are shown on Drawing 1 in Appendix B. Figure 1 shows a typical view of the existing pathway at the time of the investigation.

Figure 1: View of existing pathway, view looking east

3. Published Data

3.1 Geology

Reference to the NSW seamless geology mapping (Colquhoun, et al., 2021) indicates the site is generally underlain by Anthropogenic deposits (Q_h, shown as brown area in Figure 2) with Estuarine channel deposits (QH_ecw, brown-yellow mapped area) in the river to the south and Ashfield Shale (Twia, shown in green) to the north. The Anthropogenic deposits are described to varying from large man-made clasts (concrete blocks to building demolition rubble) to quarried natural boulders, with interstitial matrix of sand and clay. The estuarine soils then the Ashfield Shale unit are expected to underlie the surface anthropogenic deposit.

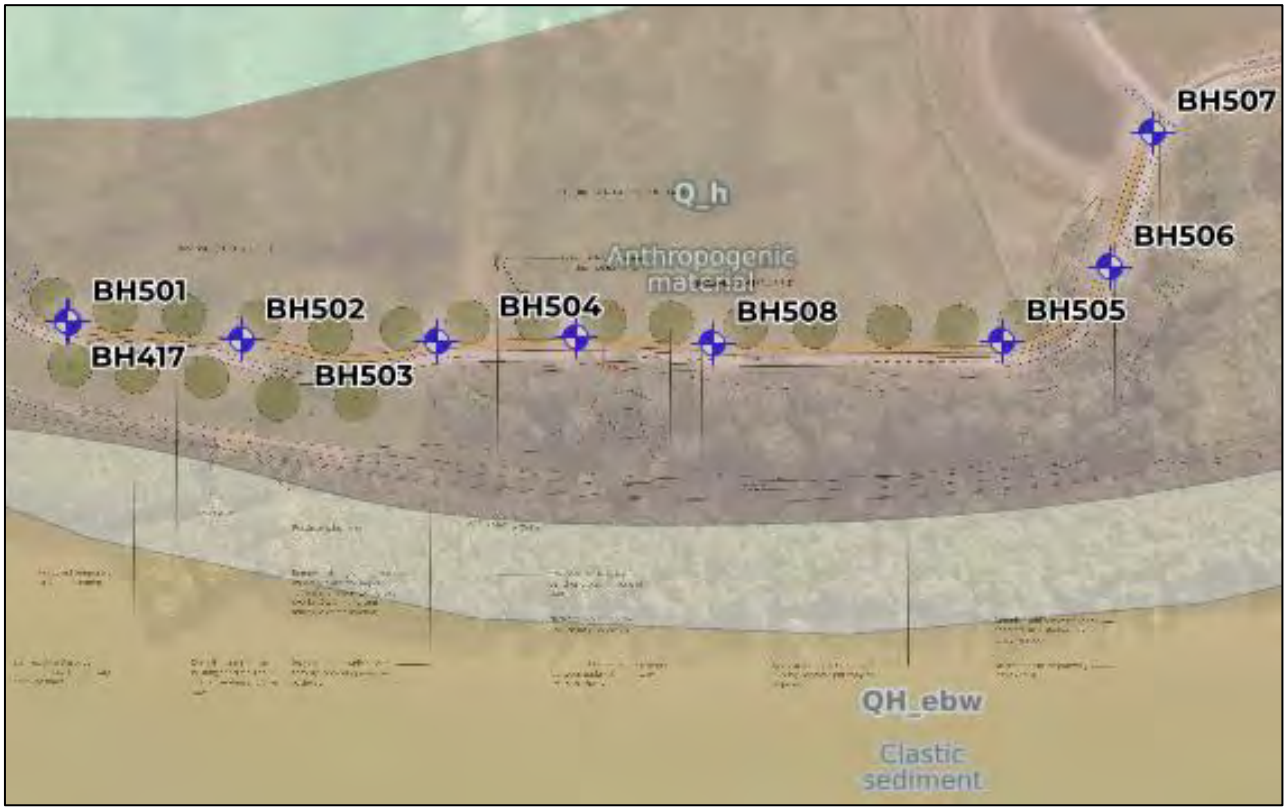

Figure 2: Geological mapping at the proposed development site. Sourced from NSW seamless geology mapping (Colquhoun, et al., 2021).

3.2 Acid Sulfate Soil Risk

Acid Sulfate Soil (ASS) Risk Mapping published by NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW, 1998) indicate a high risk of ASS typically being present near the site, as is shown in Figure 3 in red (figure overleaf). Despite the proposed works being outside the high risk of ASS zone, ASS could still be present in both the fill and natural soils.

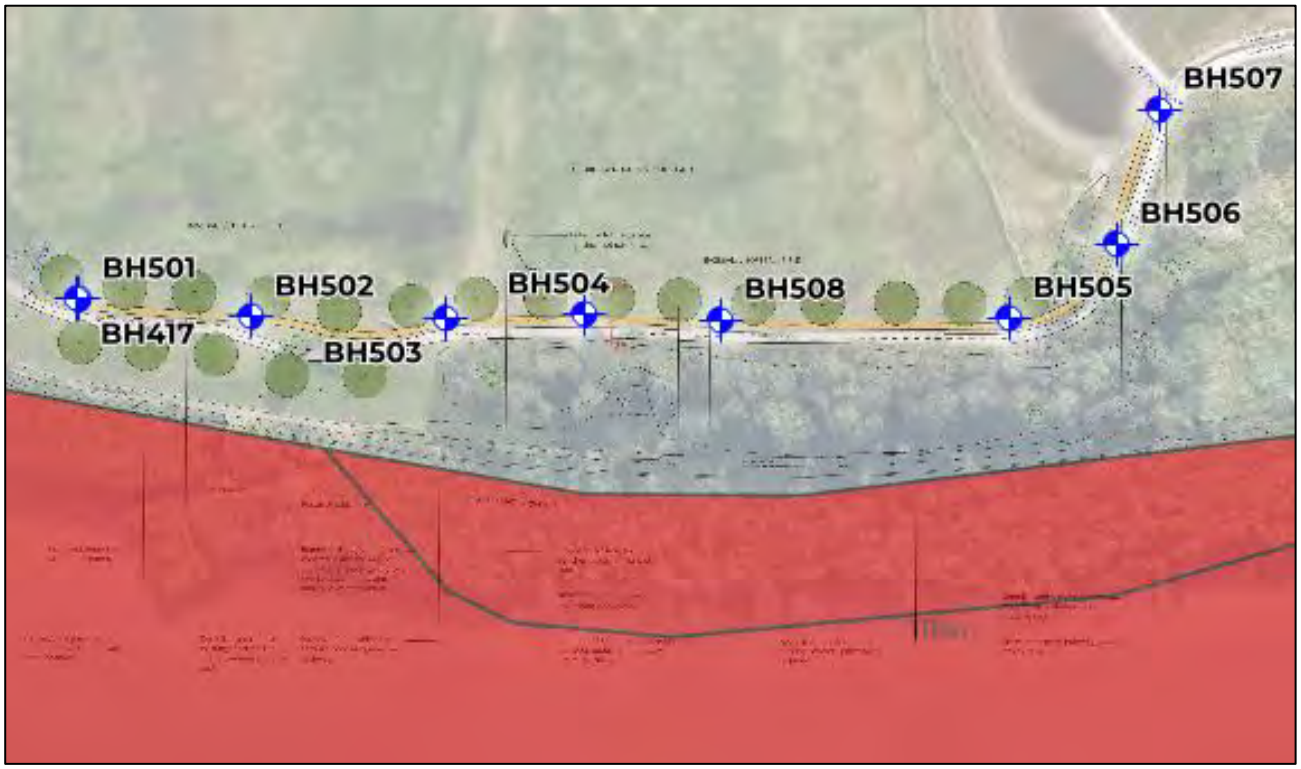

Figure 3: Acid Sulfate Soil Mapping of site area, source from NSW DCCEEW (1998).

3.3 Salinity Potential

Reference to the Salinity Potential in Western Sydney mapping published by NSW DCCEEW (2002), the site is located within a zone of moderate salinity potential. Further assessment would be required to quantify the site risks, as this was outside the scope of the current geotechnical investigation.

4. Field Work

4.1 Field Work Methods

The field work was carried out on 20 November 2024 and included:

- scanning for buried services at proposed borehole locations using both an electromagnetic scanner and ground penetrating radar (GPR);
- drilling of eight boreholes (identified as BH501 to BH508) using either a 2.5 tonne excavator or small truck-mounted drill rig fitted with solid flight augers to maximum depths of approximately 2 m. BH508 was terminated at 1.8 m due to refusal on a possible boulder or obstruction in the fill.
- disturbed and bulk sampling from the boreholes for logging (to AS1726:2017) and laboratory testing; and
- dynamic cone penetrometer (DCP) testing, in accordance with the test method AS 1289.6.3.2 (1997), at each borehole location to assess the relative in situ consistency / density of the soils.

All boreholes were backfilled with spoil and reinstated to match adjacent conditions. Coordinates and surface levels for all test locations were determined using a differential Global Positioning System (dGPS) receiver, which has an approximate accuracy of 0.1 m (subject to satellite coverage of the area). Coordinates have been measured in GDA20/MGA Zone 56 format (Geocentric Datum of Australia 2020 base with Map Grid of Australia projection) and levels are relative to AHD, as shown on the logs in Appendix C.

4.2 Field Work Results

The detailed borehole logs are included in Appendix C, together with notes defining classification methods and terms used to describe the soils. Based on the results of the site investigation, the general subsurface profile encountered at the borehole locations is summarised as follows:

- **Topsoil (Fill)** – Silty clay containing roots, generally equal to or less than 50 mm thick.
- **Fill** – Encountered in all boreholes, comprising brown to grey silty and clayey sand, low plasticity sandy silt and low to medium plasticity silty clay and sandy clay. Depth of the fill ranged between 0.9 m and 2.0 m (limit of the investigation). The DCP results indicate the fill was variably compacted across site but generally is inferred to be moderately to well compacted in the 'upper' surface. It is noted however, the fill is assessed to be 'uncontrolled' in nature due to the absence of documentation indicating otherwise.
- **Alluvium** – Encountered below the fill as low to medium plasticity, firm to hard, black and brown mottled orange-brown clay, silty clay and sandy clay. Alluvial soils were encountered in four of the eight test locations (BH501 to BH503 and BH505) at depths ranging from 0.9 m to 2.0 m (limit of the investigation).

Free groundwater was not observed during the investigation. Groundwater levels at the are likely influenced by tidal variation and other seasonal / climatic factors and may be present within 2 m of surface at some locations.

5. Laboratory Testing

5.1 Geotechnical Laboratory Testing

Geotechnical testing was undertaken in accordance with relevant Australian Standard test methods at a NATA accredited laboratory on selected soil samples, as follows:

- Atterberg limits and linear shrinkage testing on two disturbed natural samples to assess the plasticity classification of cohesive materials.
- Two bulk samples of the anticipated subgrade material were tested for measurement of California bearing ratio (CBR). The samples were compacted to approximately 100% Standard maximum dry density (MDD) ratio at the estimated optimum moisture content (OMC), and then soaked for ten days under a surcharge loading of 4.5 kg.
- Aggressivity testing (pH, chloride, sulfate, electrical resistivity) on six disturbed samples to determine the exposure classification for concrete and steel, in accordance with the Australian standard for piling (AS 2159, 2009).

Detailed results are attached in Appendix D and are summarised in the Tables 1 to 3 below.

Table 1: Summary of plasticity classification test results

Sample ID	Sample Type	PL (%)	LL (%)	PI (%)	LS (%)	Plasticity Classification
BH501 / 0.9-1.0	Sandy CLAY	15	34	19	11	Low
BH505 / 1.9-2.0	Silty CLAY	22	39	17	10	Medium

Notes: PL – Plasticity limit, LL – Liquid limit, PI – Plasticity index (difference between Plastic and Liquid Limits)
LS – Linear shrinkage

Table 2: Summary of CBR test results

Sample ID	Soil Type	FMC (%)	SOMC (%)	SMDD (t/m³)	CBR (%)	Swell during soaking (mm)
BH502/0.2-0.8	FILL/Sandy CLAY	12.2	13.9	1.83	6	1.9
BH506/0.3-1.0	FILL/Clayey SAND	7.9	10.7	1.895	13	0.9

Note: FMC – Field Moisture Content, SOMC = Standard Optimum moisture content,
SMDD – Standard Maximum dry density CBR = California bearing ratio at 100% SMDD,
FMC = field moisture content

Table 3: Summary of aggressivity test results

Sample ID	Sample Type	Soil Type	Exposure Classification				
			Concrete		Steel		
			pH	SO4 (ppm)	pH	Cl (ppm)	Resistivity (Ωcm)
BH503/0.4-0.5	FILL/Clayey SAND	B	7.8	10	7.8	<10	15,385
BH506/0.3-1.0	FILL/Clayey SAND	B	7.5	56	7.5	<10	5,882
BH507/0.9-1.0	FILL/Sandy CLAY	B	8.4	1,000	8.4	40	1,961
BH508/0.9-1.0	FILL/Gravelly SAND	B	5.4	110	5.4	22	10,417

Notes: Soil Type based on guideline presented in AS 2159-2009 and summarise below:
Soil Type A – High permeability soils (e.g. sands and gravels) which are in groundwater.
Soil Type B – Low permeability soils (e.g. silts and clays) or all soils above groundwater.
Scale of aggressivity based on threshold values given in AS 2159-2019

Non-aggressive	Mild	Moderate	Severe	Very Severe

5.2 Acid Sulfate Soil Testing

To assess for the presence of acid sulfate soil, 12 soil samples were screen tested at an external NATA registered laboratory using a calibrated pH meter for measurement of the field pH in water (pH_F) and pH following oxidation in hydrogen peroxide (pH_{FOX}). This testing was undertaken to screen samples and provide indicative results of the potential or actual presence of ASS to inform further selection of samples for verification testing. Based on the results of the screening tests, Chromium Reducible Sulfur (Scr) testing was carried out on two soil samples which showed positive indicators for ASS. Results of the ASS screening testing are provided in the laboratory report included in Appendix D and are summarised in Table 4. Table 5 presents the results of the

Scr testing. Further discussion on the interpretation of these results and sample selection is provided in Section 7.1.

Table 4: Summary of ASS Screening Results

Borehole	Depth (m)	Material Description	Screening Test Results			
			Field pH (pH_F)	Oxidised pH (pH_{FOX})	Change in pH	Reaction Rate
BH501	0.4-0.5	FILL/Sandy SILT	7.8	5.5	2.3	Low reaction
BH501	0.9-1.0	FILL/Sandy SILT	7.7	6.2	1.5	Low reaction
BH501	1.9-2.0	Sandy CLAY (CL)	7.5	5.5	2.0	Low reaction
BH503	0.4-0.5	FILL/Clayey SAND	7.7	5.6	2.1	Low reaction
BH503	0.9-1.0	FILL/Clayey SAND	8.5	8.1	0.4	Medium reaction
BH503	1.9-2.0	CLAY (CL)	8.0	3.5	4.5	Low reaction
BH505	0.4-0.5	FILL/Sandy SILT	8.1	6.3	1.8	Medium reaction
BH505	0.9-1.0	FILL/Silty SAND	9.2	6.7	2.5	Low reaction
BH505	1.9-2.0	Silty CLAY (CI)	8.1	3.6	4.5	Low reaction
BH507	0.4-0.5	FILL/Gravelly SAND	7.6	4.6	3.0	Low reaction
BH507	0.9-1.0	FILL/Gravelly SAND	7.9	6.0	1.9	Low reaction
BH507	1.9-2.0	FILL/Sandy CLAY	8.2	4.9	3.3	Low reaction

Notes: Results interpreted against National guidelines (Sullivan, et al., 2018) with indicators highlighted accordingly.

Low likelihood of PASS or ASSS	Positive indicator for Potential Acid Sulfate Soil (PASS)	Positive indicator for Actual Acid Sulfate Soil (AASS)

Table 5: Laboratory Acid Sulphate Soil Test Results (Chromium Reducible Sulphur)

Borehole	Depth (m)	Material Description	pH_{KCl}	TAA (%w/w)	Scr (%w/w)	ANC (%w/w)	Net Acidity (%w/w)
BH503	1.9-2.0	CLAY (CL)	6.4	<0.01	0.01	NT	0.010
BH505	1.9-2.0	Silty CLAY (CI)	6.1	<0.01	0.01	NT	0.014

Notes: NT – Not Tested
pH_{KCl} = pH in a potassium chloride suspension.
TAA – Titratable Actual Acidity, measure of the readily available and dischargeable acidity.
ANC – Acid Neutralising Capacity, soils ability to buffer / resist reduction in pH.
Net Acidity – the net results of the TAA and Scr measurements, without ANC reduction.
Results about action criteria are in **BOLD**

6. Proposed development

Based on the client supplied Concept Design Drawings (Rev D, dated October 2024), it is understood the proposed development at George Kendall Riverside Park will include the following:

- Construction of a new 2 m wide at-grade concrete pedestrian pathway to match the existing pathway, offset with a 1 m wide turf median;
- Repair of damaged sections of the existing pathway to convert it into a dedicated cycleway;
- Demolition of existing concrete slabs, shelters, seating and bike racks;
- Construction of new 3 m aluminium benches on concrete slabs;
- Placement of topsoil and re-turfing to improve water runoff and minimise water ponding; and
- Planting of new trees.

A typical cross section of the proposed works with retaining wall is shown in Figure 4.

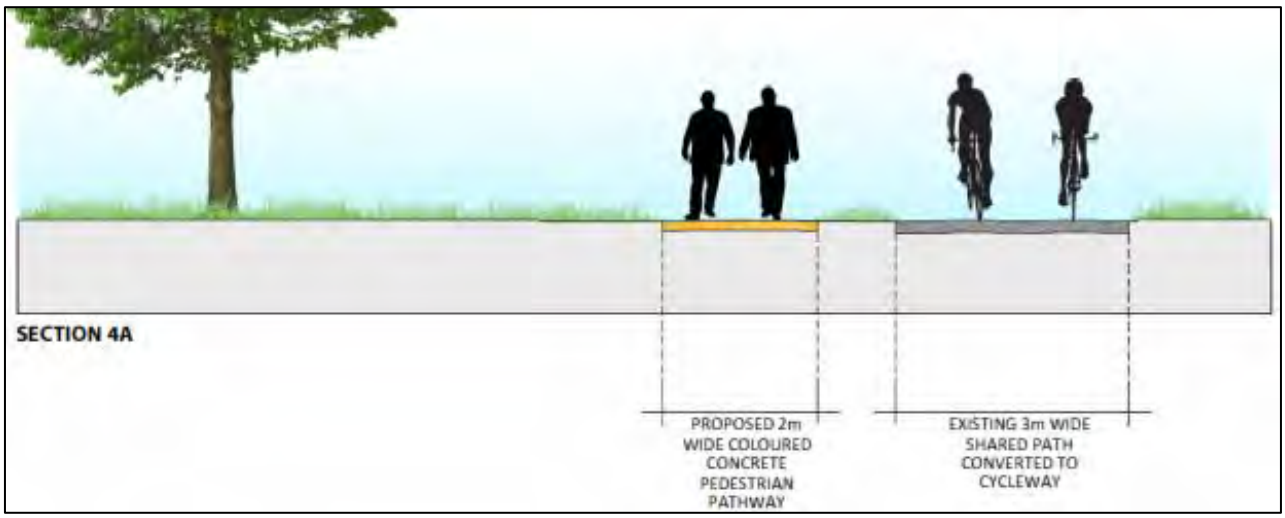

Figure 4: Cross section showing proposed works.

7. Comments

7.1 Acid Sulfate Soil (ASS) Assessment

The ASS assessment has been prepared in general accordance with the National guidelines.

The results of the screening tests showed field pH (pH_F) were in the range of 7.5 to 9.2 pH units and peroxide pH test (pH_{FOX}) were in the range of 3.5 to 8.1 pH units. The reduction in pH following addition of hydrogen peroxide (i.e. pH_F - pH_{FOX}) were typically between 1.5 and 4.5 pH units, with a single result less than pH 1.

The National guidelines (Sullivan, et al., 2018) suggest that actual acid sulfate soil (AASS) may be present where pH_F values are less than ≤ 4 pH units. This did not occur in any of the samples tested. The peroxide test was undertaken to assess the presence of potential acid sulfate soil

(PASS). The National guidelines (Sullivan, et al., 2018) suggest a positive PASS test result may include one or more of the following indicators:

- pH_{FOX} values of ≤ 3.0.
- Reduction in pH between the field and peroxide test of at least 1 pH unit.
- Effervescence (i.e. medium or stronger reaction rate)

The screening results indicated that 11 (of 12) samples showed positive indicators for PASS with four samples tested showed strong indicators (two or more positive indicators).

To assess the presence of PASS, additional Chromium Reducible Sulfur (Scr) testing was carried out on two soil samples. The action criteria to determine the presence or absence of PASS at the site is based on the textural classification of the soil material, net acidity and the volume of material expected to be disturbed. The adopted action criteria for interpreting the Scr testing is provided in Table 6. It is expected that the volume (or mass) of fill that will be disturbed during site stripping and general earthworks when preparing the subgrade of the path widening will exceed or be close to 1,000 tonnes (about 500 m^3).

Table 6: Adopted action criteria for assessing Scr testing results.

Soil Material	Texture	Volume Disturbed	Action criteria
Fill & Alluvium	Medium	> 1000 t	≥ 0.03

The results of the Scr testing of the fill and alluvial clay samples did not exceed the action criteria. **Based on the testing undertaken, the site soils are not considered to be ASS and therefore, no ASS management plan is required for disturbance of such soils.** These results are based on limited testing from discrete locations so there may be localised pockets where site soils do contain some form of ASS. Further testing may be prudent during construction to further confirm the findings of this assessment.

7.2 Site Preparation and Earthworks

Due to the inverted strength profile at the site (i.e. moderately to well compacted uncontrolled fill forming an 'upper mantle' overlying the variable strength alluvial soil), complete removal and replacement of the existing 'uncontrolled' fill is not considered necessary based on the results of the investigation (at discrete locations) and the performance of the existing pavement. Regardless, there is still a risk of differential (and possibly excessive) settlement and poor performance of the subgrade should the 'uncontrolled' fill remain in place. To further assess the suitability of the 'uncontrolled' fill as a subgrade for the pathways and retaining wall, and reduce the risks of poor performance, the following earthworks methodology is recommended:

- Excavate and remove all materials to design subgrade or foundation level, including stripping any organic-rich topsoil and other deleterious materials. Topsoil materials may be retained for re-use in landscaping, pending environmental suitability and approval.
    - Note: It is recommended that design subgrade level be at least 0.3 m below the underside of the concrete pathway slab so material re-compaction and / or replacement can be undertaken to prepare a suitable subbase layer for supporting the structures.
    - Excavations for earthworks are expected to be within fill and therefore readily excavated using conventional excavator larger than 5 t.

- Compact the existing 'uncontrolled' fill exposed at the design subgrade level to a minimum 95% density ratio relative to Standard compaction (or to a minimum 70% density index for granular soils) using non-vibratory compaction. The use of vibrations may cause over compaction and settlement of surrounding areas (impacting existing pathways) and may induce some potential liquefaction where shallow groundwater is present.
- Test roll the prepared subgrade surface using a smooth drum roller of minimum 12 tonne deadweight in non-vibratory mode (for reasons described in the previous point) in the presence of a geotechnical engineer. Any areas exhibiting unacceptable movements (e.g., excessive heave or depression) during the test-roll may require further treatment (e.g. via removal and replacement or the use of bridging layers).
- Fill can be placed in maximum 250 mm thick (loose) layers and compacted to achieve a dry density ratio of greater than 98% relative to Standard compaction (or to a minimum 70% density index for granular soils). Compaction conformance testing should be undertaken in accordance with Council requirements or at least to minimum requirements of the Australian earthworks standard (AS 3798, 2007).
    - From a geotechnical perspective, the existing fill (excluding topsoils) may be suitable for reuse onsite as 'general fill' providing they remain free of organics and other deleterious materials.
    - A layer of granular product (e.g., roadbase, recycled crushed concrete etc.) should be considered as a supporting subbase layer for the pathway and retaining wall. Such a layer may also improve trafficability on site during construction, particularly during and following periods of wet weather, if clayey soils / fill material are present;

7.3 Excavation Conditions and Batter Slopes

The proposed development of the site is generally at current surface levels, with excavations required for shaping, trimming, buried service trenches and the like.

Excavation of the fill should be achievable using conventional earthmoving equipment, such as hydraulic excavators of at least 5 tonnes mass. Cobbles and boulders may be present.

Off-site disposal of excavated material will require assessment for re-use or classification in accordance with an appropriately prepared and approved site Remediation Action Plan prior to disposal to an appropriately licensed landfill or receiving site.

Vertical excavations in the fill and alluvial soil (if exposed) are not expected to be self-supporting for any period of time. Temporary batter slopes could be adopted for shallow excavations up to a maximum depth of 3 m where they are sufficiently distant from site boundaries, existing structures and in-ground services, and should be no steeper than 1.5H:1V. Vertical trenches will require appropriately designed shoring. If surcharge loads are applied near the crest of a slope, then further specific geotechnical review, and probably flatter batters or stabilisation using rock bolts or soil nails, may be required. Permanent batter slopes cut into the fill should be no steeper than 5H:1V and should be grassed or landscaped to provide erosion protection.

7.4 Soil Aggressivity

The laboratory test results for the aggressivity of soils indicate that the soil samples are generally 'non-aggressive' however, some results indicate 'mild' aggressivity to both concrete and steel

structures, in accordance with the provisions of Australian Piling Standard (AS 2159, 2009). The Standard also provides classifications where buried structures may be exposed to waste (either domestic or industrial) and / or groundwater (fresh or sea water). It is anticipated that the proposed concrete slabs would be founded within fill, containing some waste (assume domestically sourced), and potentially with some exposure to a fluctuating groundwater table which could be considered as 'sea water'. As such, it may be prudent for the designer to adopt a 'severe' classification to account for potentially worse conditions.

The designer will need to allow for sufficient coverage for embedded concrete elements and corrosion allowance for steel elements. The designer should also consider, and allow for, the presence for ASS, and the potential generation of sulfuric acids should an oxidation event occur.

7.5 **Pavements**

The concrete pavement for the proposed new pathway is expected to be founded on the existing uncontrolled fill. Recommendations for subgrade preparation of the uncontrolled fill are provided in Section 7.1 of this report.

Laboratory testing of two samples within the fill indicated CBR values of 6% and 13% when compacted to 100% SMDD. In situ DCP testing of the upper 1.5 m subgrade zone indicates in situ subgrade CBR values ranging from about 3% to greater than 30% based on the Austroads (2024) correlation for cohesive materials.

Based on these test results and Douglas' experience in similar conditions, it is suggested that a design CBR value of 5% be adopted sitewide for pavement design purposes.

Suitable cross-fall drainage and subsoil drains along the high side of all pavement or path areas should be provided to reduce the risk of the subgrade becoming saturated during the life of the pavement.

8. References

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Sullivan, L., Ward, N., Toppler, N., & Lancaster, G. (2018). *National Acid Sulfate Soils guidance: National acid sulfate soils sampling and identification methods manual*. Department of Agriculture and Water Resources, Canberra ACT. CC BY 4.0.

9. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at George Kendall Riverside Park, Ermington NSW in line with Douglas' proposal dated 22 August 2024 and acceptance received from Shane Lauger of City of Parramatta Council. The work was carried out under Short Form Contract for Services (1.13). This report is provided for the exclusive use of City of Parramatta Council for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for

interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

The scope of work for this investigation/report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of fill of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such fill may contain contaminants and hazardous building materials.

Appendix A

About this Report

Terminology, Symbols and Abbreviations

Soil Descriptions

Sampling, Testing and Excavation Methodology

About this Report

November 2023

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Terminology, Symbols and Abbreviations

November 2023

Introduction to Terminology, Symbols and Abbreviations

Douglas Partners' reports, investigation logs, and other correspondence may use terminology which has quantitative or qualitative connotations. To remove ambiguity or uncertainty surrounding the use of such terms, the following sets of notes pages may be attached Douglas Partners' reports, depending on the work performed and conditions encountered:

- Soil Descriptions;
- Rock Descriptions; and
- Sampling, insitu testing, and drilling methodologies

In addition to these pages, the following notes generally apply to most documents.

Abbreviation Codes

Site conditions may also be presented in a number of different formats, such as investigation logs, field mapping, or as a written summary. In some of these formats textual or symbolic terminology may be presented using textual abbreviation codes or graphic symbols, and, where commonly used, these are listed alongside the terminology definition. For ease of identification in these note pages, textual codes are presented in these notes in the following style XW. Code usage conforms with the following guidelines:

- Textual codes are case insensitive, although herein they are generally presented in upper case; and
- Textual codes are contextual (i.e. the same or similar combinations of characters may be used in different contexts with different meanings (for example `PL` is used for plastic limit in the context of soil moisture condition, as well as in `PL(A)` for point load test result in the testing results column)).

Data Integrity Codes

Subsurface investigation data recorded by Douglas Partners is generally managed in a highly structured database environment, where records "span" between a top and bottom depth interval. Depth interval "gaps" between records are considered to introduce ambiguity, and, where appropriate, our practice guidelines may require contiguous data sets. Recording meaningful data is not always appropriate (for example assigning a "strength" to a concrete pavement) and the following codes may be used to maintain contiguity in such circumstances.

Term	Description	Abbreviation Code
Core loss	No core recovery	KL
Unknown	Information was not available to allow classification of the property. For example, when auguring in loose, saturated sand auger cuttings may not be returned.	UK
No data	Information required to allow classification of the property was not available. For example if drilling is commenced from the base of a hole predrilled by others	ND
Not Applicable	Derivation of the properties not appropriate or beyond the scope of the investigation. For example providing a description of the strength of a concrete pavement	NA

Graphic Symbols

Douglas Partners' logs contain a "graphic" column which provides a pictorial representation of the basic composition of the material. The symbols used are directly representing the material name stated in the adjacent "Description of Strata" column, and as such no specific graphic symbology legend has been provided in these notes.

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Soil Descriptions

Terminology
Symbols
Abbreviations

March 2024

Introduction

All materials which are not considered to be "in-situ rock" are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:

The "classification" comprises a two character "group symbol" providing a general summary of dominant soil characteristics. The "name" summarises the particle sizes within the soil which most influence its behaviour. The detailed description presents more information about composition, condition, structure, and origin of the soil.

Classification, naming and description of soils require the relative proportion of particles of different sizes within the whole soil mixture to be considered.

Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either "fine grained" (also known as "cohesive" behaviour) or "coarse grained" ("non cohesive" behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Designation	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as "oversize"	
Cobble	63 - 200		
Gravel[1]	2.36 - 63	Coarse	>65%
Sand[1]	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

[1] – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer "component proportions" below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a "Sandy CLAY", this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a "primary", "secondary", or "minor" component of the soil mixture, depending on its influence over the soil behaviour.

Component Proportion Designation	Definition[1]	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor[2]	Present in the soil, but not significant to its engineering properties	All other components	All other components

[1] As defined in AS1726-2017 6.1.4.4

[2] In the detailed material description, minor components are split into two further sub-categories. Refer "identification of minor components" below.

Composite Materials

In certain situations, a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example, "INTERBEDDED Silty CLAY AND SAND".

Soil Descriptions

Classification

The soil classification comprises a two character group symbol. The first character identifies the primary component. The second character identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

Soil Name

For most soils, the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way, the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component [1]	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

[1] – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters (?), with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	Clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	Clay/silt: 0-5% sand/gravel: 0-15%

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

Soil Composition

Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

Grain Size

Type		Particle size (mm)
Gravel	Coarse	19 - 63
	Medium	6.7 - 19
	Fine	2.36 – 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21

Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular size or size range within the total range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

Soil Condition

Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	w<PL
	Near plastic limit	Can be moulded	w=PL
	Wet of plastic limit	Water residue remains on hands when handling	w>PL
	Near liquid limit	"oozes" when agitated	w=LL
	Wet of liquid limit	"oozes"	w>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code NDF, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials, the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered material origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description.

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example (VS).

Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	St
Very stiff	Indented by thumbnail	>100 - ≤200	VSt
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	Fr

Relative Density (coarse grained soils)

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15 - ≤35	L
Medium dense	>35 - ≤65	MD
Dense	>65 - ≤85	D
Very dense	>85	VD

Note, tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

AS1726-2017 considers weathered material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. less than very low strength rock). These materials may be identified as "extremely weathered material" in reports and by the abbreviation code XWM on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RS
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than 'very low' as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Fluvial	Deposited by channel fill and overbank (natural levee, crevasse splay or flood basin)	FLV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LAC
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Slopewash	Thin layers of soil and rock debris gradually and slowly deposited by gravity and possibly water	SW
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or seashore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

The presence of particles considered to be "oversize" may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with "MIXTURE OF".

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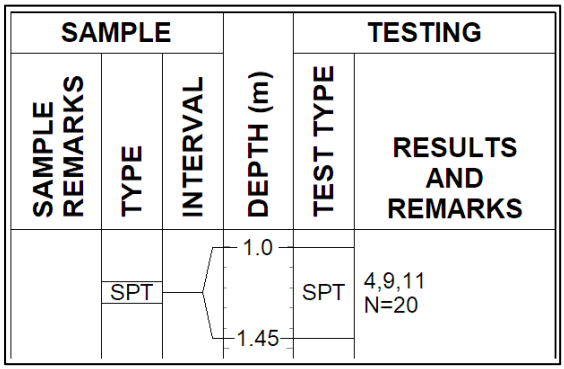
Sampling, Testing and Excavation Methodology

Terminology
Symbols
Abbreviations

March 2024

Sampling and Testing

A record of samples retained, and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:



Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Acid Sulfate sample	ASS
Bulk sample	B
Core sample	C
Disturbed sample	D
Environmental sample	ES
Gas sample	G
Piston sample	P
Sample from SPT test	SPT
Undisturbed tube sample	U[1]
Water sample	W
Material Sample	MT
Core sample for unconfined compressive strength testing	UCS

[1] – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y =x blows for y mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS

Field and laboratory testing (continued)

Test Type	Code
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(_)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150

Groundwater Observations

▷	seepage/inflow
▽	standing or observed water level
NFGWO	no free groundwater observed
OBS	observations obscured by drilling fluids

Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left-hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

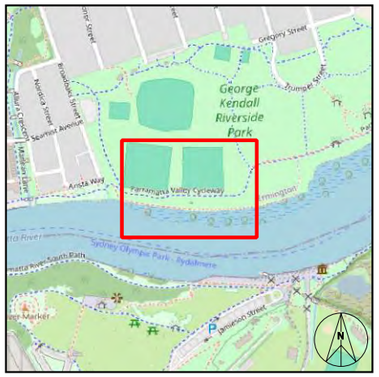
Method	Abbreviation Code
Direct Push	DP
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD[1]
Air Track	AT
Diatube	DT[1]
Hand auger	HA[1]
Hand tools (unspecified)	HAND
Existing exposure	X
Hollow flight auger	HSA[1]
HQ coring	HQ3
HMLC series coring	HMLC
NMLC series coring	NMLC
NQ coring	NQ3
PQ coring	PQ3
Predrilled	PD
Push tube	PT[1]
Ripping tyne/ripper	R
Rock roller	RR[1]
Rock breaker/hydraulic hammer	EH
Sonic drilling	SON[1]
Mud/blade bucket	MB[1]
Toothed bucket	TB[1]
Vibrocore	VC[1]
Vacuum excavation	VE
Wash bore (unspecified bit type)	WB[1]

[1] – numeric suffixes indicate tool diameter/width in mm

Douglas PARTNERS

Appendix B

Drawings



SITE LOCATION

LEGEND

Borehole Location

0 10 20 30 40 50 m

NOTE:
1. Drawing projection in GDA2020 / MGA zone 56
2. Basemap from Metromap (dated 02.09.2024), and base plan from client supplied drawing.
3. Test locations were located using differential GPS typically accurate to ± 0.1 m depending on satellite coverage

Douglas PARTNERS

CLIENT: Parramatta Council		
OFFICE: Sydney	DRAWN BY: JV	
SCALE: 1:1000 @A3	DATE: 20.12.2024	

TITLE: **Site Location and Test Plan**
Eastern Parramatta River & CBD Precinct Cycleway
George Kendall Riverside Park, Ermington, NSW

N

PROJECT:	231248.00
DRAWING No:	1E
REVISION:	0

Appendix C

Borehole Logs

BOREHOLE LOG

CLIENT: City of Parramatta Council
PROJECT: Proposed Pedestrian and Cycleway
LOCATION: George Kendall Riverside Park, Ermington, NSW

SURFACE LEVEL: 6.0 AHD
COORDINATE: E:320487.7, N:6255770.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH501
PROJECT No: 231248.00
DATE: 20/11/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
20/11/24 No free groundwater observed whilst augering		0.05	FILL / TOPSOIL / SILTY CLAY: dark brown; with rootlets.		FILL	NA	w=PL		A/D		0.10	DCP9/150	5 10 15
			FILL / Sandy SILT, trace clay: brown; low to medium plasticity; fine sand. From 0.20m: trace medium to coarse gravel		FILL	WC			A/D		0.20		24
									A/D		0.40		
		0.90	Sandy CLAY (CL-CI), trace gravel: grey mottled orange-brown; low to medium plasticity; medium sand; fine gravel. From 1.60m: brown mottled orange brown; with silt		ALV	VSt to H	w<PL		A/D		0.50		
	5	1							A/D		0.90		
											1.00	DCP9/150	5 10 15
	4	2							A/D		1.90		23
			Borehole discontinued at 2.00m depth. Target depth reached.								2.00		25/50mm

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT10 Truck Rig
METHOD: AD (100mmØ) to 2.0m
REMARKS: Borehole drilled adjacent to BH417

OPERATOR: Ground Test (TK/GM)

LOGGED: I. Howsam
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: City of Parramatta Council
PROJECT: Proposed Pedestrian and Cycleway
LOCATION: George Kendall Riverside Park, Ermington, NSW

SURFACE LEVEL: 5.9 AHD
COORDINATE: E:320534.7, N:6255765.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH502
PROJECT No: 231248.00
DATE: 20/11/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] DENSITY.[*]	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
20/11/24 No free groundwater observed whilst augering		0.05	FILL / TOPSOIL / SILTY CLAY: dark brown; with rootlets.		FILL	NA	w<PL				0.10	DCP9/150	5 10 15
			FILL / Sandy SILT, trace clay: brown; low to medium plasticity; fine sand.		FILL				A/D		0.20		
		0.30	FILL / Sandy CLAY, with gravel: brown; low to medium plasticity; medium sand; medium to coarse gravel.		FILL	WC	w<PL		A/B				33
					FILL	ND					0.80		26
	5	1.00	CLAY (CI), with sand, trace gravel; medium plasticity; fine to medium sand; fine to medium gravel.		ALV	St to VSt	w=PL				1	DCP9/150	5 10 15
	4					VSt							
		2	Borehole discontinued at 2.00m depth. Target depth reached.						A/D		1.90 2.00		
	3												

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT10 Truck Rig
METHOD: AD(300mmØ) to 0.9m AD(100mmØ) to 2.0m
REMARKS:

OPERATOR: Ground Test (TK/GM)

LOGGED: I. Howsam
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: City of Parramatta Council
PROJECT: Proposed Pedestrian and Cycleway
LOCATION: George Kendall Riverside Park, Ermington, NSW

SURFACE LEVEL: 6.2 AHD
COORDINATE: E:320587.8, N:6255765.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH503
PROJECT No: 231248.00
DATE: 20/11/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] DENSITY.[*]	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
20/11/24 No Free Groundwater Observed Whilst Augering	6	0.05	FILL / TOPSOIL / SILTY CLAY: dark brown; with rootlets.		FILL	NA	w≈PL				0.10	DCP9/150	5 10 15
			FILL / Silty SAND, trace gravel: dark brown; fine to medium; low plasticity silt; fine gravel.		FILL		M		A/D		0.20		
		0.30	FILL / Clayey SAND, with gravel: pale brown; fine to medium; low to medium plasticity clay; fine to medium gravel.		FILL	WC	D				0.40		
									A/D		0.50		23
						ND							25/11mm
		0.90	CLAY (CL-CI), with sand, trace gravel: brown mottled orange brown; low to medium plasticity; medium sand; fine gravel.		ALV	St	w≈PL		A/D		0.90	DCP9/150	5 10 15
	5	1									1.00		
						F to St	w>PL						
									A/D		1.90		
	4	2									2.00		
			Borehole discontinued at 2.00m depth. Target depth reached.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT10 Truck Rig
METHOD: AD(100mmØ) to 2.0m
REMARKS:

OPERATOR: Ground Test (TK/GM)

LOGGED: I. Howsam
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: City of Parramatta Council
PROJECT: Proposed Pedestrian and Cycleway
LOCATION: George Kendall Riverside Park, Ermington, NSW

SURFACE LEVEL: 6.9 AHD
COORDINATE: E:320625.5, N:6255766.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH504
PROJECT No: 231248.00
DATE: 20/11/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
20/11/24 No Free Groundwater Observed Whilst Augering		0.05	FILL / TOPSOIL / SILTY CLAY: dark brown; with rootlets.		FILL	NA	w=PL						
			FILL / Sandy SILT, trace clay: brown; low plasticity; fine to medium sand.			WC			A/D		0.10	DCP9/150	24
			From 0.30m: with medium gravel								0.20		25/90mm
					FILL				A/D		0.40		
						ND	w<PL				0.50		
	6	0.80	FILL / Silty CLAY, trace sand, trace gravel: dark grey; medium plasticity; fine to medium sand.						A/D		0.90		
	1				FILL						1.00	DCP9/150	
		1.40	FILL / Gravelly SAND, trace clay: yellow brown; medium; medium gravel; low plasticity clay.			WC							26/100mm
	5				FILL		D						
	2	2.00	Borehole discontinued at 2.00m depth. Target depth reached.						A/D		1.90		
	4												

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT10 Truck Rig
METHOD: AD(100mmØ) to 2.0m
REMARKS:

OPERATOR: Ground Test (TK/GM)

LOGGED: I.Howsam/D.Pham
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: City of Parramatta Council
PROJECT: Proposed Pedestrian and Cycleway
LOCATION: George Kendall Riverside Park, Ermington, NSW

SURFACE LEVEL: 7.3 AHD
COORDINATE: E:320741.1, N:6255765.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH505
PROJECT No: 231248.00
DATE: 20/11/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
20/11/24 No Free Groundwater Observed Whilst Augering	7	0.05	FILL / TOPSOIL / SILTY CLAY: dark brown; with rootlets.		FILL	NA	w=PL		A/D		0.10	DCP9/150	5 10 15
			FILL / Sandy SILT, trace clay, trace gravel; low plasticity; fine to medium sand.		FILL	WC	w<PL		A/D		0.20		
		0.70	FILL / Silty SAND, trace clay, trace gravel; fine; low plasticity silt.		FILL	ND	D		A/D		0.40		
	6	1									0.50		HB 20/50mm
		1.10	Silty CLAY (CI): black motted grey-brown; medium plasticity.		ALV	VSt to H	w=PL		A/D		0.90	DCP9/150	5 10 15
	5	2									1.00		
			Borehole discontinued at 2.00m depth. Target depth reached.						A/D		1.90		21
											2.00		

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT10 Truck Rig
METHOD: AD(100mmØ) to 2.0m
REMARKS:

OPERATOR: Ground Test (TK/GM)

LOGGED: I.Howsam/D.Pham
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: City of Parramatta Council
PROJECT: Proposed Pedestrian and Cycleway
LOCATION: George Kendall Riverside Park, Ermington, NSW

SURFACE LEVEL: 6.6 AHD
COORDINATE: E:320770.3, N:6255785.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH506
PROJECT No: 231248.00
DATE: 20/11/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
20/12/24 No Free Groundwater Observed Whilst Augering		0.05	FILL / TOPSOIL / SILTY CLAY: dark brown; with rootlets.		FILL	NA	w=PL				0.10	DCP9/150	5 10 15
			FILL / Sandy SILT, trace clay, trace gravel: brown; low plasticity; fine to medium sand.		FILL	WC	ND		A/D		0.20		25/90mm
		0.30	FILL / Clayey SAND, trace gravel: pale brown; low plasticity clay; medium to coarse, sandstone gravel.		FILL	ND			A/B		0.30		
	6												
		1.00	FILL / Gravelly SAND, trace clay: brown; fine to medium; fine to medium gravel; low plasticity clay.		FILL	MC to WC	D				1.00	DCP9/150	5 10 15
	5												
									A/D		1.90		
	2		Borehole discontinued at 2.00m depth. Target depth reached.								2.00		
	4												

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT10 Truck Rig
METHOD: AD(300mmØ) to 1.0m AD(100mmØ) to 2.0m
REMARKS:

OPERATOR: Ground Test (TK/GM)

LOGGED: I.Howsam/D.Pham
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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BOREHOLE LOG

CLIENT: City of Parramatta Council
PROJECT: Proposed Pedestrian and Cycleway
LOCATION: George Kendall Riverside Park, Ermington, NSW

SURFACE LEVEL: 7.0 AHD
COORDINATE: E:320782.0, N:6255822.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH507
PROJECT No: 231248.00
DATE: 20/11/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
20/11/24 No Free Groundwater Observed Whilst Augering		0.05	FILL / TOPSOIL / SILTY CLAY: dark brown; with rootlets.		FILL	NA	w=PL				0.10	DCP9/150	5 10 15
			FILL / Gravelly SAND, trace clay: brown; fine to medium; fine to medium gravel.		FILL				A/D		0.20		
		0.30	FILL / Gravelly SAND, trace clay: brown; fine to medium; fine to medium gravel.		FILL	WC			A/D		0.40		25/125mm
	6										0.50		
		1			FILL		D		A/D		0.90		
											1.00	DCP9/150	5 10 15
		1.50	FILL / Sandy CLAY: brown; medium plasticity; fine to medium sand.		FILL	VC			A/D		1.90		
	5	2									2.00		
			Borehole discontinued at 2.00m depth. Target depth reached.										
	4												

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: GT10 Truck Rig
METHOD: AD(100mmØ) to 2.0m
REMARKS:

OPERATOR: Ground Test (TK/GM)

LOGGED: I. Howsam
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

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BOREHOLE LOG

CLIENT: City of Parramatta Council
PROJECT: Proposed Pedestrian and Cycleway
LOCATION: George Kendall Riverside Park, Ermington, NSW

SURFACE LEVEL: 7.0 AHD
COORDINATE: E:320662.5, N:6255765.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH508
PROJECT No: 231248.00
DATE: 20/11/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
20/11/24 No Free Groundwater Observed Whilst Augering	7	0.05	FILL / TOPSOIL / SILTY CLAY: dark brown; with rootlets.		FILL	NA	w=PL		A/D	0.10	0.10	DCP9/150	refusal 25
			FILL / Gravelly SAND, with clay: grey- brown; fine to medium; medium to coarse gravel; low plasticity clay; some cobbles.							0.20	0.20		
									A/D	0.40	0.40		
					FILL	ND	D			0.50	0.50		
	6	1							A/D	0.90	0.90		
		1.40	FILL / Sandy CLAY, with gravel: brown; low to medium plasticity; fine to medium sand; fine to medium gravel.		FILL	WC	w<PL			1.00	1.00	DCP9/150	
									A/D	1.70	1.70		
			Borehole discontinued at 1.80m depth. Auger refusal in fill, possible boulder.								1.80		HB 15/75mm
	5	2											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 2.5t Excavator
METHOD: AD(150mmØ) to 1.8m
REMARKS:

OPERATOR: Cirillo (LD)

LOGGED: I.Howsam/D.Pham
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

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Appendix D

Laboratory Results

Material Test Report

Report Number:	**231248.00-2**
Issue Number:	1
Date Issued:	17/12/2024
Client:	City of Parramatta Council
	CITY OF PARRAMATTA COUNCIL, Parramatta NSW
Contact:	Shane Lauger
Project Number:	231248.00
Project Name:	Proposed Pedestrian and Cycleway
Project Location:	Multiple Locations, Parramatta NSW
Work Request:	11984
Sample Number:	SY-11984C
Date Sampled:	20/11/2024
Dates Tested:	22/11/2024 - 09/12/2024
Sampling Method:	Sampled by Engineering Department
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**BH501 (0.9 - 1.0m)**
Material:	Sandy CLAY: trace gravel, grey mottled orange-brown, medium sand, fine gravel

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	34		
Plastic Limit (%)	15		
Plasticity Index (%)	**19**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**11.0**		
Cracking Crumbling Curling	None		

Douglas Partners Pty Ltd
Sydney Laboratory
96 Hermitage Road West Ryde NSW 2114
Phone: (02) 9809 0666
Email: andrew.hutchings@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Andrew Hutchings
Associate / Laboratory Manager
Laboratory Accreditation Number: 828

Material Test Report

Douglas Partners Pty Ltd
Sydney Laboratory
96 Hermitage Road West Ryde NSW 2114
Phone: (02) 9809 0666
Email: andrew.hutchings@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Andrew Hutchings
Associate / Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **231248.00-2**
Issue Number: 1
Date Issued: 17/12/2024
Client: City of Parramatta Council
CITY OF PARRAMATTA COUNCIL, Parramatta NSW
Contact: Shane Lauger
Project Number: 231248.00
Project Name: Proposed Pedestrian and Cycleway
Project Location: Multiple Locations, Parramatta NSW
Work Request: 11984
Sample Number: SY-11984D
Date Sampled: 20/11/2024
Dates Tested: 22/11/2024 - 09/12/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **BH505 (1.9 - 2.0m)**
Material: Silty CLAY: black mottled grey brown

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	39		
Plastic Limit (%)	22		
Plasticity Index (%)	**17**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**10.0**		
Cracking Crumbling Curling	None		

Material Test Report

Douglas Partners Pty Ltd
Sydney Laboratory
96 Hermitage Road West Ryde NSW 2114
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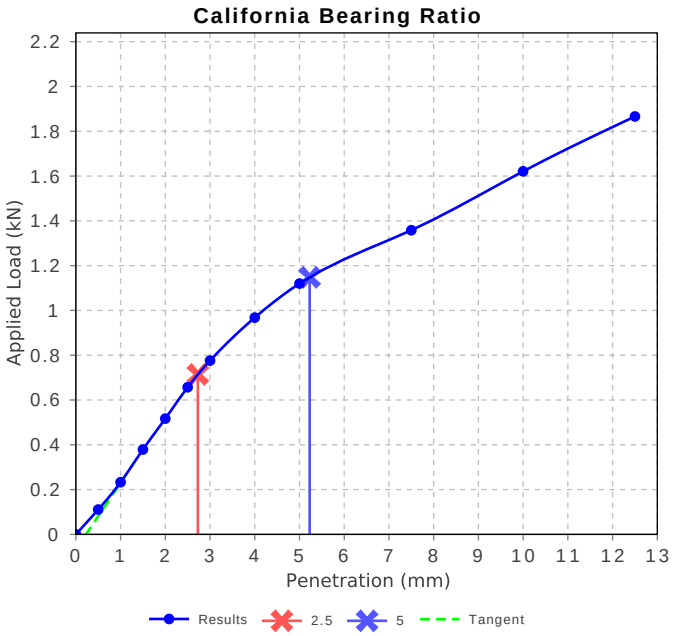
Approved Signatory: Andrew Hutchings
Associate / Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **231248.00-2**
Issue Number: 1
Date Issued: 17/12/2024
Client: City of Parramatta Council
CITY OF PARRAMATTA COUNCIL, Parramatta NSW
Contact: Shane Lauger
Project Number: 231248.00
Project Name: Proposed Pedestrian and Cycleway
Project Location: Multiple Locations, Parramatta NSW
Work Request: 11984
Sample Number: SY-11984A
Date Sampled: 20/11/2024
Dates Tested: 22/11/2024 - 12/12/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **BH502 (0.2 - 0.8m)**
Material: FILL / Sandy CLAY: with gravel, brown, medium sand, medium to coarse gravel

California Bearing Ratio (TS 02795.11 & 02795.14)		Min	Max
CBR taken at	5 mm		
CBR %	**6**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	TS 02795.06 & 02795.14		
Maximum Dry Density (t/m^3)	1.830		
Optimum Moisture Content (%)	13.9		
Target Laboratory Density Ratio (%)	100		
Laboratory Density Ratio (%)	100		
Target Laboratory Moisture Ratio (%)	100		
Laboratory Moisture Ratio (%)	99		
Dry Density after Soaking (t/m^3)	1.799		
Field Moisture Content (%)	12.2		
Moisture Content Top 30mm (%)	19.8		
Moisture Content Full Depth (%)	16.2		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	10		
Swell (%)	1.9		
Material Retained on 19 mm (%)	5		
Oversize Material Included	Excluded		



Material Test Report

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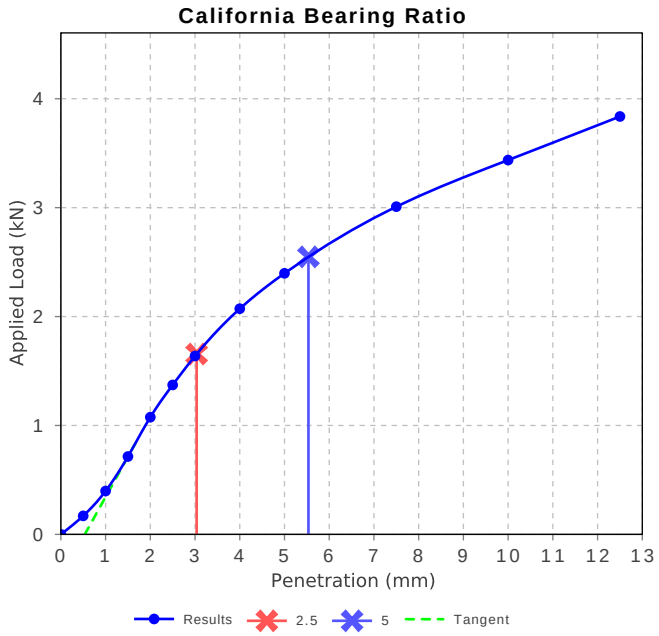
Approved Signatory: Andrew Hutchings
Associate / Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **231248.00-2**
Issue Number: 1
Date Issued: 17/12/2024
Client: City of Parramatta Council
CITY OF PARRAMATTA COUNCIL, Parramatta NSW
Contact: Shane Lauger
Project Number: 231248.00
Project Name: Proposed Pedestrian and Cycleway
Project Location: Multiple Locations, Parramatta NSW
Work Request: 11984
Sample Number: SY-11984B
Date Sampled: 20/11/2024
Dates Tested: 22/11/2024 - 12/12/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **BH506 (0.3 - 1.0m)**
Material: FILL / Clayey SAND: trace gravel, pale brow, medium to coarse, sandstone gravel

California Bearing Ratio (TS 02795.11 & 02795.14)		Min	Max
CBR taken at	5 mm		
CBR %	**13**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	TS 02795.06 & 02795.14		
Maximum Dry Density (t/m^3)	1.895		
Optimum Moisture Content (%)	10.7		
Target Laboratory Density Ratio (%)	100		
Laboratory Density Ratio (%)	100		
Target Laboratory Moisture Ratio (%)	100		
Laboratory Moisture Ratio (%)	96		
Dry Density after Soaking (t/m^3)	1.885		
Field Moisture Content (%)	7.9		
Moisture Content Top 30mm (%)	17.0		
Moisture Content Full Depth (%)	13.7		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	10		
Swell (%)	0.9		
Material Retained on 19 mm (%)	11		
Oversize Material Included	Excluded		
Sample moulded 0.5% dry of OMC, 95.5% moisture ratio			



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CERTIFICATE OF ANALYSIS 367417-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	Peter Valenti
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**231248.00 Various**
Number of Samples	71 Soil
Date samples received	26/11/2024
Date completed instructions received	27/11/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	04/12/2024
Date of Issue	04/12/2024

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Results Approved By
Diego Bigolin, Inorganics Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

sPOCAS field test						
Our Reference		367417-A-13	367417-A-14	367417-A-15	367417-A-16	367417-A-17
Your Reference	UNITS	BH501	BH501	BH501	BH503	BH503
Depth		0.4-0.5	0.9-1.0	1.9-2.0	0.4-0.5	0.9-1.0
Date Sampled		20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/11/2024	26/11/2024	26/11/2024	26/11/2024	26/11/2024
Date analysed	-	29/11/2024	29/11/2024	29/11/2024	29/11/2024	29/11/2024
pH_F (field pH test)	pH Units	7.8	7.7	7.5	7.7	8.5
pH_{FOX} (field peroxide test)	pH Units	5.5	6.2	5.5	5.6	8.1
Reaction Rate*	-	Low reaction	Low reaction	Low reaction	Low reaction	Medium reaction

sPOCAS field test						
Our Reference		367417-A-18	367417-A-19	367417-A-20	367417-A-21	367417-A-22
Your Reference	UNITS	BH503	BH505	BH505	BH505	BH507
Depth		1.9-2.0	0.4-0.5	0.9-1.0	1.9-2.0	0.4-0.5
Date Sampled		20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/11/2024	26/11/2024	26/11/2024	26/11/2024	26/11/2024
Date analysed	-	29/11/2024	29/11/2024	29/11/2024	29/11/2024	29/11/2024
pH_F (field pH test)	pH Units	8.0	8.1	9.2	8.1	7.6
pH_{FOX} (field peroxide test)	pH Units	3.5	6.3	6.7	3.6	4.6
Reaction Rate*	-	Low reaction	Medium reaction	Low reaction	Low reaction	Low reaction

sPOCAS field test			
Our Reference		367417-A-23	367417-A-24
Your Reference	UNITS	BH507	BH507
Depth		0.9-1.0	1.9-2.0
Date Sampled		20/11/2024	20/11/2024
Type of sample		Soil	Soil
Date prepared	-	26/11/2024	26/11/2024
Date analysed	-	29/11/2024	29/11/2024
pH_F (field pH test)	pH Units	7.9	8.2
pH_{FOX} (field peroxide test)	pH Units	6.0	4.9
Reaction Rate*	-	Low reaction	Low reaction

Method ID	Methodology Summary
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions.

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			26/11/2024	[NT]	[NT]	[NT]	[NT]	26/11/2024	[NT]
Date analysed	-			29/11/2024	[NT]	[NT]	[NT]	[NT]	29/11/2024	[NT]
pH_F (field pH test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	99	[NT]
pH_{FOX} (field peroxide test)	pH Units		Inorg-063	[NT]	[NT]	[NT]	[NT]	[NT]	99	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

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Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

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CERTIFICATE OF ANALYSIS 367417-E

Client Details

Client	Douglas Partners Pty Ltd
Attention	Joshua Valencic
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**231248.00 Various**
Number of Samples	Additional analysis
Date samples received	26/11/2024
Date completed instructions received	11/12/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	18/12/2024
Date of Issue	18/12/2024

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Jenny He, Inorganic Team Leader

Authorised By
Nancy Zhang, Laboratory Manager

Chromium Suite			
Our Reference		367417-E-18	367417-E-21
Your Reference	UNITS	BH503	BH505
Depth		1.9-2.0	1.9-2.0
Date Sampled		20/11/2024	20/11/2024
Type of sample		Soil	Soil
Date prepared	-	12/12/2024	12/12/2024
Date analysed	-	13/12/2024	13/12/2024
pH $_{kcl}$	pH units	6.4	6.3
s-TAA pH 6.5	%w/w S	<0.01	<0.01
TAA pH 6.5	moles H^+ /t	<5	<5
Chromium Reducible Sulfur	%w/w	0.01	0.01
a-Chromium Reducible Sulfur	moles H^+ /t	6	9
S_{HCl}	%w/w S	[NT]	[NT]
S_{KCl}	%w/w S	[NT]	[NT]
S_{NAS}	%w/w S	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	[NT]	[NT]
s-ANC_{BT}	%w/w S	[NT]	[NT]
s-Net Acidity	%w/w S	0.010	0.014
a-Net Acidity	moles H^+ /t	6.2	8.8
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75
a-Net Acidity without ANCE	moles H^+ /t	6.2	8.8
Liming rate without ANCE	kg $CaCO_3$ /t	<0.75	<0.75
s-Net Acidity without ANCE	%w/w S	0.010	0.014

Method ID	Methodology Summary
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Net acidity including ANC has a safety factor of 1.5 applied. Neutralising value (NV) of 100% is assumed for liming rate. The recommendation that the SHCL concentration be multiplied by a factor of 2 to ensure retained acidity is not underestimated, has not been applied in the SHCL result. However, it has been applied in the SNAS calculation: SNAS % = (SHCL-SKCL)x2

QUALITY CONTROL: Chromium Suite					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			12/12/2024	[NT]	[NT]	[NT]	[NT]	12/12/2024	[NT]
Date analysed	-			13/12/2024	[NT]	[NT]	[NT]	[NT]	13/12/2024	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	98	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	88	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	93	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

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In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

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CERTIFICATE OF ANALYSIS 367911

Client Details

Client	Douglas Partners Pty Ltd
Attention	Peter Valenti
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**231248.00 Various**
Number of Samples	43 Soil
Date samples received	02/12/2024
Date completed instructions received	02/12/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	09/12/2024
Date of Issue	09/12/2024

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Nick Sarlamis, Assistant Operation Manager
Priya Samarawickrama, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

Misc Inorg - Soil					
Our Reference		367911-16	367911-17	367911-18	367911-19
Your Reference	UNITS	BH503	BH508	BH506	BH507
Depth		0.4-0.5	0.9-1.0	0.3-1.0	0.9-1.0
Date Sampled		20/10/2024	27/10/2024	20/10/2024	20/10/2024
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	04/12/2024	04/12/2024	04/12/2024	04/12/2024
Date analysed	-	04/12/2024	04/12/2024	04/12/2024	04/12/2024
pH 1:5 soil:water	pH Units	7.8	5.4	7.5	8.4
Electrical Conductivity 1:5 soil:water	µS/cm	65	96	170	510
Chloride, Cl 1:5 soil:water	mg/kg	<10	22	<10	40
Sulphate, SO4 1:5 soil:water	mg/kg	10	110	56	1,000

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Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

MISC_INORG_DRY: pH/EC
Samples were out of the recommended holding time for this analysis.

Major Construction Management Plan

The following have been identified as significant environmental aspects for the site:
These aspects shall be managed with the environmental protection measures outlined on this plan.

Management

1. Responsibilities:

Emergency Contact 1: Name – Mobile – Email
Emergency Contact 2: Name – Mobile – Email

5. Staging of Works:
Approximate Months of Construction

2. Communication of CMP Requirements:
A Copy of the CMP to be kept onsite at all times & made available to all contractors. Site inspections will be undertaken weekly & after rain event/s to ensure adherence to all items in the CMP.

6. Informing Residents and Businesses:
Nearby residents shall be informed at least two days prior to any construct on works via let er drop and door knock.

3. Inspections and Maintenance:

7. Associated Documents:

4. Traffic Management
The Principal Contractor is to define control measures in a Construction Traffic Management Plan prepared in accordance with Councils and TfNSW requirements. This shall appropriately manage internal site traffic, including pedestrian and cycle movements to ensure the safety of workers and public as well as outline required signage and fencing to assist with ensuring safety for all. Signs advising of the proposed works and changes to traffic conditions, as well as areas under construction, should be visibly placed around the area of works. The Construction Traffic Management Plan is to be approved by the CoP before works commence.

Noise **Risk: Significant / Med / Low**

Requirement: EPA NSW and Council requirements must be adhered to in relation to the level of noise and working h ours, to ensure that residents and other applicable neighbours to the site are not disturbed unreasonably. The generation of noise must be minimized.

7. Working Hours:
7 am to 6pm Monday - Friday
8 am to 5pm Saturday |24-hour contact details of site manager:
Council's superintendent: Peter Kazanzidis (0477 760 228)
Community consultation and complaints handling;
Council's project managers Hans Smit (8839 4014)
Arusha Bhowmik (8839 3379)

8. Noise Minimization Methods:

9. Other:

Dust **Risk: Significant / Med / Low**

Requirement: Dust generation must be minimized to ensure there is no health risk or loss of amenity and prevented on dry, windy days.

10. Minimizing Dust Generation:
Works on hot, dry, windy days to be minimized to prevent dust. Restrict vehicle movements onsite.

12. Contingencies:

11. Dust Suppression: Dust suppression will be controlled by means of water, using sprinkler/s or handheld hose/s with a trigger nozzle.

13. Other: Any debris deposited by vehicles on roads is to be minimized when vehicles are leaving the site and council roads/footpaths are to be kept clean and maintained to the satisfaction of council officers.

Erosion and Sediment **Risk: Significant / Med / Low**

Requirement: Erosion and sediment control plans are to be established by the Principal Contractor and approved by the CoP prior to commencement of works. The controls must be maintained in place until the works are complete and all exposed erodible materials are stabilised. All sediment control measures must be checked regularly and repaired or re-installed (if required) if heavy rainfall is forecast. Erosion and sediment must be managed in accordance with current best practice environmental management practices, to prevent sediment-laden water from entering any drainage system or natural waterway. Mud must not be transported on to nearby roads.

. Drainage Management:
Debris deposited by vehicles on the road is to be minimized when vehicles are leaving the site and kept clean and maintained to the satisfaction of Council Officers.

17. Sediment Traps:
Sediment traps to be placed on All Internal Drainage Pit/s & Council Pit/s

18. Dewatering:

Major Construction Management Plan (1) – Site Setout and Construction Protection Measures

Project Name: Construction Management Plan - WICR322-Eastern Parramatta River & CBD Precinct Cycleway

Date and Revision:

Approved Drainage Plan Here

Legend: Ex Fence —— Temp Fence —— Gate Waste Toilet

Site Shed Sediment Trap TPZ Area Contractor Parking

15. Soil Stabilization:
During Construction:

Post Works:

16. Stockpile Protection:

19. Vehicle and Road Management.

Roads - must be kept clean, to satisfaction of Council, at all times. Use only nominated access points.

Site Access - Vehicle movements to & from the site & deliveries will only occur during the approved working hours.

Cleaning - Vehicles are to be inspected & cleaned of debris by scraping with a shovel & broom before leaving the site.

Cleaning - Streets any material deposited on roadway to be swept up by means of shovel & broom or use of a street sweeper. Or as directed by an Authorized Council Officer. Using Street Sweeper as required and as directed by Authorized officer, any urgent cleaning may be undertaken by Council's contractor and the cost of this will be subtracted from the bond.

20. Other:

Waste **Risk: Significant / Med / Low**

21.Detail Construction Waste Management Plan (CWMP) - A detailed Construction Waste Management Plan (CWMP) is to be prepared by the Principal Contractor specifying the likely waste generation and how the waste generated will be disposed of. Waste material taken off site will be appropriately classified and managed in accordance with the Waste Classification Guidelines (EPA November 2014). The CWMP is to be approved by the CoP before works commence. Demolition work plans - to be provided along with final landscape drawings

Requirement: Litter and waste must be contained on site, before disposal in a responsible manner. Skip bins must have hinged lids and be kept closed each night and on wind affected days.

21. Movement of Soil: Of- site / On Site / N/A Contaminant Status:

22. Waste Minimization Methods:

. Waste Storage and Disposal: All rubbish bin/s and skip bin/s will have lids or be covered to contain airborne material/s.
All timber and metalworks to be recycled where possible.

24. Other:

Chemicals **Risk: Significant / Med / Low**

Requirement: Storage and spill management practices must be implemented to ensure that no environmental damage can result from the escape or spillage of chemicals or fuels.

25. Storage:

26: Spill Management:

27. Refueling Procedure:

28. Other:

Other Site-Specific Issues

Flora and Fauna Risk: Significant / Med / Low	**Archaeological/Heritage Risk: Significant / Med / Low**	**Blank 1 Risk: Significant / Med / Low**
Requirement: All significant flora and fauna on and adjacent to the site must be protected in accordance with AS4970-2009	**Requirement:** Places, sites and objects of archaeological or heritage significance must be protected.	31.
29. Yes / No. Details: Prior to the commencement of any building works appropriate tree protection fencing must be erected in accordance with Australian Standard AS47902009 & remain in place until completion of works.	30. Yes / No. Details:	

RISK ASSESSMENT CHECKLIST

Noise

Issues: • Nature of Noise Generating Works: • Potential Noise Receptors: • Proximity of Works to Noise Receptors:	Likelihood Consequence Overall Risk

Dust

Issues: • • Dust Sources: • Potential Dust Receptors: • Proximity of Works to Dust Receptors: • Extent of Exposed Earth and Duration of Time Exposed: Wind Conditions:	Likelihood Consequence Overall Risk

Erosion and Sediment

Issues: • Erosion and Sediment Sources: • Potential Erosion and Sediment Receptors: • Proximity of Works to Erosion and Sediment Receptors: • Extent of Exposed Earth and Duration of Time Exposed: • Soil Type and Erosivity: • Slope: • Site Drainage Regime: • Rainfall: • Vehicle Movements on and Off Site:	Likelihood Consequence Overall Risk

Waste

Issues: • Nature of Waste to be Generated: • Presence of Waste on Site Prior to Work Commencement: • Quantity of Waste Anticipated: • Potential Waste Receptors: • Proximity to Potential Waste Receptors:	Likelihood Consequence Overall Risk

Chemicals

Issues: • Types of Chemicals and Fuels Used and/or Stored on Site: • Quantities of Chemicals and Fuels Used and/or Stored on Site: • Potential Chemical Receptors: • Proximity to Potential Chemical Receptors:	Likelihood Consequence Overall Risk

Significant Flora/ Fauna

Issues: • Types of Flora/ Fauna: • Vulnerability of Flora / Fauna: • Proximity of Flora/Fauna to Works: • Work Activities Which May Threaten Flora / Fauna: • Potential Impacts on Flora / Fauna:	Likelihood Consequence Overall Risk

Major Construction Management Plan (2) - Risk Assessment and Designs of Environmental Protection Measures

Project Name: Construction Management Plan - WICR322-Eastern Parramatta River & CBD Precinct Cycleway
Date and Revision:

Environmental protection measures shall be constructed in accordance with the following designs.

△ Archaeological/ Heritage						
Issues: • Traditional Land Owners Consulted? Yes/ No • Survey or Assessment Conducted? Yes/ No / Not Required • Probability of Encountering Archaeological/ Heritage Items During Works: • Types of Archaeological/ Heritage Items on Site: • Proximity of Archaeological/ Heritage Items to Works on Site: • Work Activities Which May Threaten Archaeological/ Heritage Items: • Potential Impacts on Archaeological/ Heritage Items:	Likelihood Consequence Overall Risk	†Blank 1 Issues: •	Likelihood Consequence Overall Risk	†Blank 2 Issues: •	Likelihood Consequence Overall Risk

I have read this Construction Management Plan and agree to undertake works and ensure sub-contractors undertake works in accordance with this plan.

Developer: _____ Date: _____

Consultant: _____ Date: _____

Contractor: _____ Date: _____

planning consultants

Statement of Heritage Impact

Construction of a Pedestrian Pathway & Landscaping

George Kendall Riverside Park, Ermington

Prepared for: City of Parramatta
January 2025

PO Box 230 North Ryde BC NSW 1670 | P 02 9980 6933 | www.dfpplanning.com.au

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File Name: 22169B SoHI. George Kendall Riverside Park, Ermington
Project Manager: Brian McDonald
Client: City of Parramatta
Project Number: 22169B

Document Control

Version	Prepared By	Reviewed By	Issued To	Date
Rev_1, Draft	Brian McDonald	Tom West		30 November 2024
Rev_2, Final	Brian McDonald	Henry Burnett	Client	28 January 2025

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1 Introduction

1.1 Commission

DFP has been commissioned by the City of Parramatta (Council) to prepare a Statement of Heritage Impact (SoHI) for the proposed works to George Kendal Riverside Park, Ermington, located on the northern side of the Parramatta foreshore.

This SoHI report assesses the potential environmental impacts which could arise from the 'Proposal' which include:

- Construction of a 2m wide concrete pedestrian path;
- Use of an existing 3m wide shared path as a cycleway; and
- Landscaping works.

1.2 Methodology and Structure

The methodology used in the preparation of this SoHI is in accordance with the principles and definitions as set out in the guidelines to *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance October 2013)* and the latest version of the Statement of Heritage Impact Guidelines (2002), produced by the Heritage NSW, Department of Premier and Cabinet (DPC), accessed October 2015.

This SoHI reviews the relevant statutory heritage controls, assesses the impact of the proposal on the subject property and makes recommendations as to the level of impact. The proposed works have been assessed in relation to the relevant controls and provisions contained within the *Parramatta Local Environmental Plan 2023* (LEP) and the Parramatta Development Control Plan 2023 (DCP).

1.3 Site Identification

1.3.1 Location and Legal Description

The site is located approximately 2km to the west of Rhodes, 1.2km to the west of Wentworth Point and approximately 5km to the east of the Parramatta Central Business District (CBD). The site is located within the City of Parramatta Local Government Area (LGA).

The site is Crown Land (Crown Reserve R76841) managed by Council as the Crown Land manager under the *Crown Land Management Act 2016* (CLM Act). The site is known as George Kendall Riverside Park (GKRP), Ermington and has a legal property description of Lot 7313 in DP 1157169.

A survey of the site is included at **Appendix 1** of this REF.

The site is irregularly shaped with frontages to Broadoaks Street to the west, as well as Honor Street, Trumble Avenue, Boyle Street and Murdoch Street to the north. To the east, the site adjoins Gregory Street. The intention is that the proposed upgrades at GKRP will provide a link to the Stage Government funded upgrades to the park, which are due to be open to the public prior to these works commencing.

To the south of the site is Parramatta River.

Figure 1 below is a locality plan showing the site outlined in red line.

1 Introduction

Figure 1 Site Location

Figure 2 is an aerial photograph of the site, showing the location of the proposed pedestrian path in red.

Figure 2 Aerial Photograph

1.4 Report Limitations

The proposed works are in the vicinity of LEP heritage item no. I011 known as Parramatta River Wetlands, no. 160, known as Well in George Kendall Reserve, no. I161, known as Spurway Street Wharf and no. I162, known as Rose Farm Wharf. This report is limited to assessment of the potential physical and visual impacts on the significance of the item. Due to the natural characteristics of the heritage item documentary and historical research is not warranted.

Archaeological assessment of the subject site is outside the scope of this report. The Review of Environmental Factors report includes a mitigation measure in the event of archaeological evidence being encountered.

This report only addresses the relevant heritage planning provisions and does not address general planning or environmental management considerations.

1 Introduction

1.5 Abbreviations and Definitions

SoHI	Statement of Heritage Impact
ICOMOS	International Council on Monuments and Sites
Burra Charter	refers to '*The Burra Charter*' prepared by Australia ICOMOS October 2013

The conservation terms used throughout this report are based on the terms and definitions adopted by *The Burra Charter, The Australia ICOMOS Charter for places of cultural significance* (Australia ICOMOS October 2013). *The Burra Charter* forms the basis for cultural conservation within Australia and is acknowledged by government heritage agencies around Australia. Terms used in this plan are defined below:

Place, means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

Cultural Significance, means aesthetic, historic, scientific, social or spiritual value for past, present or future generations. Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.

Fabric means all the physical material of the place including fixtures, contents and objects.

Conservation means all the processes of looking after a place so as to retain its cultural significance, as listed in the History Section of this report.

Maintenance means the continuous protective care of the fabric, and setting of a place, and is to be distinguished from repair. Repair involves restoration or reconstruction.

Integrity (not a Burra Charter definition) means the degree to which a place or component of a place retains the form and completeness of its physical fabric, historical associations, use or social attachments that give the place its cultural significance.

Preservation means maintaining the fabric of a place in its existing state and retarding deterioration.

Restoration means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction means returning a place to a known earlier state and is distinguished from restoration by the introduction of new material into the fabric.

Adaptation means modifying a place to suit the existing use or a proposed use. [Article 7.2 states regarding use that: *a place will have a compatible use*]

Compatible use means a use, which respects the cultural significance of a place. Such a use involves no, or minimal impact on cultural significance.

Interpretation means all the ways of presenting the cultural significance of a place.

2 Physical Description

2.1.1 Physical Description

Existing infrastructure on the site include a shared pedestrian and cycle path that extends between the eastern and western ends of the site. The land consists of existing trees, grass covers and low-lying shrubs and sports courts.

Figures 3 to Figure 8 are photographs of the site.

Figure 3 Photograph of George Kendall Riverside Park looking east

Figure 3 Photograph towards the eastern side of George Kendall Riverside Park

2 Physical Description

Figure 4 Photograph taken from George Kendall Riverside Park looking south to Parramatta River

Figure 5 Photograph of recent State Government funded upgrades to George Kendall Riverside Park

2.1.2 Vegetation

There is a variety of trees and shrubs across the southern side of the GKRP site. Scattered trees are located within the vicinity of the proposed 2m wide pedestrian path, which are to be retained as part of the proposal. The central portion of the site is mostly grassed, as it is used for recreational purposes, including sporting activities.

Parts of the southern portions of the site are mapped coastal wetlands and comprises biodiversity values (non-EPI).

2.2 Surrounding Development

To the north of the site is Honor Street, Trumble Avenue, Boyle Street and Murdoch Street, with land to the north predominantly containing low-density residential properties, including single and two storey dwelling houses.

To the east of the proposed works is a part of GKRP that has recently been redeveloped as part of the State Government's 'Parks for People Program'. The upgraded park comprises large open space areas, habitat restoration and wetland areas, an off-leash dog area, car parking and play equipment. The intention is that the works proposed as part of this SoHI, will provide a connection the State Government funded upgrades within the park.

2 Physical Description

To the south of the site is Parramatta River. The existing pathway skirts the northern edge of the heritage listed wetlands.

To the west of the site is Royal Shores (a medium to high density master-planned residential development). The proposed path extension towards the west of the site will link to an existing shared pedestrian and cycle path along Royal Shores.

3 Heritage Significance

3.1 Significance Assessment

Heritage item I011, I160, I161 and I162 are depicted in the extract from Parramatta Local Environmental Plan Heritage Map in **Section 5.2.**

3.1.1 Parramatta River Wetlands

The following statement of heritage significance is extracted from the NSW Heritage Inventory Sheet for the Parramatta River Wetlands heritage item No. I011 in the LEP:

> *The wetlands along Parramatta River are of significance for Parramatta area as remnant representative areas of mangroves and salt marshes which once extensively lined the foreshores and tidal water flats of the region.*

A photograph of the wetlands along the Parramatta River foreshore is provided at **Figure 6** below.

Figure 6 Photograph of wetlands along the Parramatta River foreshore

3.1.2 Spurway Street Wharf

A review of a City of Parramatta Heritage Study has described this wharf as being constructed of stone walls and earth infill. The upper courses and the earthen infill are missing, and the remaining stones from the wharf have been disturbed.

The historical details relating to this wharf from the City of Parramatta Heritage Study are quoted below.

> *The structure was a public wharf used as a ferry stop by Parramatta River Steamers and Tramway Co as early as 1885. It seems probable that this public wharf was built some time after the privately owned wharf a short distance away to the east. Its construction date was probably c. 1877.*

Figure 7 below is a photograph of part of Spurway Street Wharf

4 Heritage Significance

Figure 7 Photograph of part of Spurway Street Wharf

3.1.3 Rose Farm Wharf

The following statement of heritage significance is extracted from the NSW Heritage Inventory Sheet for Rose Farm Wharf, heritage item I162 in the LEP:

> *The Rose Farm Wharf is of significance for Parramatta local area for historic reasons and as a representative example of this type of structure in the 19th Century. The wharf ,built before 1877, demonstrates the importance of the river as an early transport route. The site also processes potential to contribute to an understanding of traditional wharf construction techniques.*

Figure 8 below is a photograph of part of Rose Farm Wharf.

Figure 8 Photograph of part of Rose Farm Wharf

3.1.4 Well in George Kendall Reserve

A review of a City of Parramatta Heritage Study has described the well in George Kendall Reserve as comprising concrete slab marks from the former well.

The historical details relating to this well from the City of Parramatta Heritage Study are quoted below.

4 Heritage Significance

Land was utilised as farm land in nineteenth century. In 1872 the farm included a garden and shrubbery.

The well possesses potential to contribute to an understanding of early farming settlement in the area.

4 Proposed Development

4.1 Summary of Proposed Development

In summary the proposed development comprises:

- Construction of a 2m wide concrete pedestrian path;
- An existing 3m wide shared path is proposed to be utilised as a cycleway;
- Removal of concrete slabs, seating and bicycle racks, and
- Landscaping works

The following subsections provide a more detailed description of the proposed works and should be read in conjunction with the accompanying consultant plans and reports.

4.2 New Pedestrian Path

A new pedestrian path is proposed to the north of the existing shared pedestrian and cycle path. The existing 3m wide path will become utilised as a cycle path, so as to separate cyclists from pedestrians.

The proposed pedestrian path will be 2m wide and will be coloured to appear as though it has a sandstone finish. This will assist in differentiating the pedestrian path from the cycle path.

Figure 9 is an extract of the Proposed Site Plan.

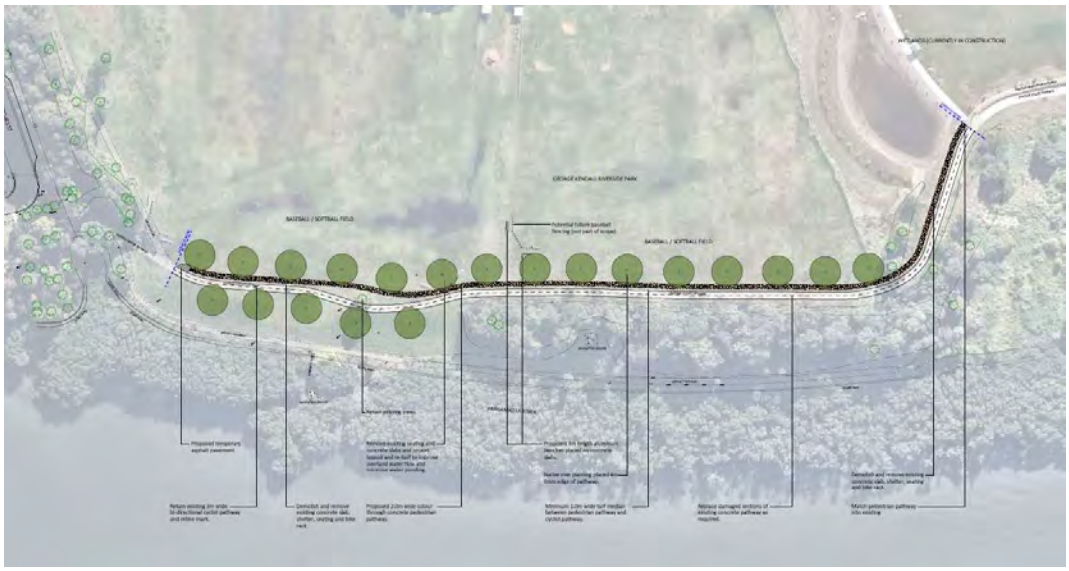


Figure 9 Proposed Site Plan. Source: City of Parramatta

4.3 Landscaping

Additional tree planting is proposed on both sides of the proposed pedestrian path. Existing trees and native vegetation within the immediate surrounds of the proposed path are to be retained.

5 Assessment of Heritage Impact

5.1 Introduction

The site includes heritage item I011 Parramatta River Wetlands under the LEP, which extends along the northern shoreline of the Parramatta River. Item I161 Spurway Street Wharf and I162 Rose Farm Wharf are in the vicinity at the western end of George Kendal Park. Item I160 Well in George Kendall Reserve is also in the vicinity of the site, located to the north.

An extract of the heritage map for the site is provided at **Figure 10** below.

Figure 10 Heritage Map extract PLEP 2023.

The proposed scope of works has been assessed against the following impact assessment criteria:

- The New South Wales Heritage Council Guidelines and Statements of Heritage Impact

The accepted practice in assessing the levels of impact on items, places or fabric of heritage significance is to adopt the following grading[1]:

Impact Grading	*Built Heritage or Historic Landscape Attributes*
No Change	No change to Fabric or setting.
Negligible	Slight changes to historic building elements or setting that hardly affect it and have no impact upon significance.
Minor	Change to key historic building elements, such that the asset is slightly altered.
Moderate	Changes to many key historic building elements, such that the resource is moderately altered.
Major	Change to key historic building elements that contribute to the listing such that the resource is totally altered. Comprehensive changes to setting.

5.2 Statutory Controls

The provisions of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI) allow the proposed works to be carried out as development without consent under Part 5 of the *Environmental Planning & Assessment Act 1979* (EP&A Act). The works are subject to a Review of Environmental Factors under section 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation). This assessment considers

[1] ICOMOS – Guidance on Heritage Impact Assessment for Cultural World Heritage Properties, A publication of the International Council on Monuments and Sites, January 2011, downloaded 23/2/2015.

5 Assessment of Heritage Impact

the relevant provisions of Section 171(2) of the EP&A Regulation, specifically the following environmental factor as it relates to heritage.

(e) the effects on any locality, place or building that has-

(i) aesthetic, anthropological, archaeological, cultural, historical, scientific or social significance, or

(ii) other special value for present and future generations.

Section 2.11 of SEPP TI addresses consultation with councils – development with impacts on local heritage. The relevant provisions of subclause (1) state:

(1) *This section applies to development carried out by or on behalf of a public authority if the development—*

(a) is likely to affect the heritage significance of a local heritage item, or of a heritage conservation area, that is not also a State heritage item, in a way that is more than minor or inconsequential, and

(b) is development that this Chapter provides may be carried out without consent.

(2) A public authority, or a person acting on behalf of a public authority, must not carry out development to which this section applies unless the authority or the person has—

(a) had an assessment of the impact prepared.

This SoHI satisfies the requirements of Section 171(2) of the EP&A Regulation as set out in this SoHI.

Notwithstanding the above, Section 2.17 of SEPP TI sets out exceptions whereby Sections 2.10 – 2.15 do not apply. Subclause (c) provides that consultation in accordance with Section 2.10 – 2.15 is not required to be given to Council or a public authority that is carrying out the development. In this instance, Council is carrying out the proposed development.

Additionally, the proposed development is not likely to affect the heritage items in the vicinity. Being adjacent to and not within the items and augmenting works already in existence, physical impacts will be avoided, and visual impacts will be negligible and, in these circumstances, consultation is not required.

This assessment also takes into account the relevant environmental criteria at subsection 171(2)(e) of the EP&A Regulation:

(e) the effects on any locality, place or building that has—

(i) aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance, or

(ii) other special value for present or future generations,

These criteria are very broad and are capture suitably by the provisions of Clause 5.10 of LEP.

Table 1 Review against relevant clauses of Parramatta LEP 2023

LEP Clause	Discussion
5.10 Heritage conservation (1) **Objectives** The objectives of this clause are as follows: (a) to conserve the environmental heritage of the City of Parramatta; (b) to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views, (c) to conserve archaeological sites,	The pathway and landscaping works for the existing pathway in George Kendal Park are minor in scale and are located adjacent to the wetlands. The proposed works are consistent with the objectives of the Clause 5.10 of the LEP. The works will cause negligible physical and visual impacts on the wetlands vegetation, environment and ecology.

5 Assessment of Heritage Impact

Table 1 Review against relevant clauses of Parramatta LEP 2023	
(d) to conserve Aboriginal objects and Aboriginal places of heritage significance.	
(2) **Requirement for consent** Development consent is required for any of the following: (a) demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance): (i) a heritage item, (ii) an Aboriginal object, (iii) a building, work, relic or tree within a heritage conservation area, (e) erecting a building on land: (i) on which a heritage item is located or that is within a heritage conservation area, or (ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance	Consent is not strictly required under sub clause (2) as the proposed activity is not located on or within a heritage item. The proposed activity will also not demolish, or alter the exterior of any of the detail, fabric, finish or appearance of any of the heritage items within the vicinity. The works do not comprise any removal or alteration of any significant vegetation. An AHIMS Search (**Appendix 13**) was undertaken on 3 October 2024 which identified one (1) known Aboriginal Sites or Places within a 200m radius of the site. There are no known indigenous or cultural heritage items, objects or relics within the site. Notwithstanding, if during the construction works, Aboriginal objects are relics are uncovered, a Mitigation Measure has been included in the Review of Environmental Factors to cease works immediately and contact the relevant authority.
(4) **Effect of proposed development on heritage significance** The consent authority must, before granting consent under this clause in respect of a heritage item or heritage conservation area, consider the effect of the proposed development on the heritage significance of the item or area concerned. This subclause applies regardless of whether a heritage management document is prepared under subclause (5) or a heritage conservation management plan is submitted under subclause (6).	This SoHI provides the necessary information to make an assessment under sub clause (4). This SoHI is a heritage management document.
(5) **Heritage assessment** The consent authority may, before granting consent to any development: (a) on land on which a heritage item is located, or (b) on land that is within a heritage conservation area, or (c) on land that is within the vicinity of land referred to in paragraph (a) or (b), require a heritage management document to be prepared that assesses the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item or heritage conservation area concerned.	This SoHI is a heritage management document
(6) **Heritage conservation management plans** T he consent authority may require, after considering the heritage significance of a heritage item and the extent of change proposed to it, the submission of a heritage conservation management plan before granting consent under this clause.	A Heritage Conservation Management plan is not warranted in these circumstances.

5 Assessment of Heritage Impact

The assessment of heritage impacts is summarised below:

ITEM	IMPACT
Two-metre-wide concrete footpath	Visual: Negligible Physical: None
Existing three-metre-wide shared path to be used as a cycle way	Visual: None Physical: None
Landscape works	Visual: None Physical: None
Removal of miscellaneous items:	Visual: None Physical: None

5.2.1 Parramatta Development Control Plan 2023

Table 2 provides an assessment against the DCP. Part 7 of the DCP entitled 'Heritage and Archaeology' provides general objectives for development on and in the vicinity of heritage and archaeology. The proposed works are consistent with the general objectives of Part 7 insofar as potential impacts on the setting of the heritage items in the vicinity of the proposed activity:

> *O.01 Ensure the appropriate management of heritage in the City.*
>
> *O.02 Retention and reinforcement of the attributes that contribute to the heritage significance of items, areas and their settings.*
>
> *O.03 Ensure development is compatible with the significance and character of the area so that the new work does not detract from the historic buildings and their amenity to/or from the streetscape.*

Part 5.3.2 of Parramatta Development Control Plan 2023 addresses development associated with Waterways and The Riparian Zone. For an assessment of the impact on the values of the heritage item objective O.01 is relevant.

> *O.01 Ensure development contributes to the protection and rehabilitation of waterways in order to:*
>
> • *improve waterway health, and*
>
> • *develop and maintain ecologically sustainable waterways.*

In this regard the proposed provision of lighting, being contained to the northern side of the route of the existing pathway, use of the existing shared path as a cycleway, minor works and landscaping works are consistent with the controls of Part 5.2.3 and will have no impact on the heritage items that are located within the vicinity of the site.

6 Conclusion

6.1 Conclusions

This Statement of Heritage Impacts has been prepared by DFP for the City of Parramatta Council, the proponent and determining authority for the proposed minor upgrade works to George Kendall Riverside Park.

This Statement of Heritage Impact describes the existing site context and provides details of the proposed works which should be read in conjunction with the Review of Environmental Factors prepared by DFP Planning for the proposed upgrade works to George Kendall Riverside Park.

The proposed works are confined to the northern side of the existing pathway and will have a negligible visual impact and no physical impact on the natural significance of the remnant mangroves and saltmarsh, as well as the two (2) wharves to the south (Spurway Street Wharf and Rose Farm Wharf) and the well located in George Kendall Riverside Park to the north.

Brian McDonald
Principal Urban Designer and Heritage Consultant
DFP Planning

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 22169A

Client Service ID : 936696

Thomas West

Date: 03 October 2024

11 Dartford Road
Thornleigh New South Wales 2120

Attention: Thomas West

Email: twest@dfpplanning.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 7313, DP:DP1157169, Section : - with a Buffer of 200 meters, conducted by Thomas West on 03 October 2024.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

FINAL

CITY OF PARRAMATTA

Eastern Parramatta River

Communications & Engagement Evaluation
February 2025

CONTENTS

1. Background and summary

NSW Government funding flows to five foreshore park upgrades – *Eastern Parramatta River*

In 2022, City of Parramatta began to work on concept designs that looked to enhance amenity and active transport links across five (5) foreshore parks east of the Parramatta CBD. The project was designed to capitalise on the popularity of the ***Parramatta Valley Cycleway***, along the Parramatta River foreshore.

Supported by the ***NSW Government's Western Sydney Infrastructure Grants Program*** (WSIG), the $9M ***Eastern Parramatta River*** project proposed a program of pedestrian and cyclist amenity and safety improvements along Parramatta River foreshore paths in five (5) key locations:

1. Rangihou Reserve, Parramatta.
2. Baludarri Wetlands, Parramatta
3. Reid Park, Rydalmere
4. Royal Shores, Ermington
5. George Kendall Riverside Park, Ermington.

The ***Eastern Parramatta River*** project provides a total of **2.8km of improved paths** and more opportunities for the community to access and enjoy the natural beauty of the Parramatta River. In some locations, the project delivers separated pedestrian and cycling paths, native planting, additional lighting, and other upgrades requested by the community.

The ***Eastern Parramatta River*** project featured on the City's community engagement platform ***Participate Parramatta*** and was on public exhibition from **Monday 21 October to Thursday 21 November 2024.**

The community was asked to provide feedback on the concept designs via an interactive map and short survey.

In addition to engaging with ***Participate Parramatta***, residents could submit their feedback via social media posts, email, in writing, providing a verbal submission or contacting the project team.

A marketing campaign including advertising, park signage, web and social media content, along with eNewsletters and letterboxing, encouraged the community to have their say on the project.

2. Executive summary

Community engagement activities and evaluation

This report focuses on the reach and effectiveness of the communications and engagement strategy and channels used to promote the *Eastern Parramatta River* project. It considers the success of the level of engagement achieved through the *Participate Parramatta* portal, interactions with communication channels such as social media, audience reach, and the number of submissions received.

A high-level summary of community feedback and concerns is included in the Methodology and Response section page 5, along with recommendations on page 19.

Detailed reporting on community submissions is provided as attachments to the Council report.

Communications and engagement activities:

The ***Eastern Parramatta River*** campaign was live from **Monday 21 October to Thursday 21 November** with the community directed to find out more by visiting the City's ***Participate Parramatta*** engagement portal.

Numerous channels were activated to reach as many in the community within the footprint surrounding the five (5) parks associated with the project. The key objective was to notify residents of the scope and benefits of the proposed ***Eastern Parramatta River*** project (delivered in stages over three years) and the opportunity to have a say on the concept design for the five (5) parks:

1. Rangihou Reserve, Parramatta.
2. Baludarri Wetlands, Parramatta
3. Reid Park, Rydalmere
4. Royal Shores, Ermington
5. George Kendall Riverside Park, Ermington.

Residents could complete a short survey by following a weblink or the QR code provided on various pieces of collateral. Residents could also drop a pin and post a comment on the concept design, highlighting any items they did/did not support and adding additional comments.

Engagement reach

A community engagement campaign was designed to facilitate community feedback on the ***Eastern Parramatta River*** project over the four-week live period from **21 October to 21 November 2024.**

Council's engagement portal ***Participate Parramatta*** was the call to action for the campaign and showcased a range of educational materials as well as the concept designs for each of the five (5) parks.

Overall, information on the opportunity to provide feedback on the Eastern Parramatta River project was presented to around **156,370 people** (based on targeted letter box distributions, website traffic, social media reach, email database contacts, eNewsletters etc, where figures are available).

Participate Parramatta response

- The ***Eastern Parramatta River*** page on Participate Parramatta attracted **4,278 page views** and **2,443 unique visitors**
- **482 documents** were downloaded including **concept plans**
- The **image gallery** was viewed **189 times**
- **67 surveys were completed**
- Of residents who completed the survey:
  - **53 (79%) were supportive** of the overall project, and the improvements as presented, to the five (5) parks
  - **Twelve (12) people (18%) supported the project to an extent**
  - **One (1) was unsure, and one (1) did not support.**

During the exhibition period there were **1,083 views** of the **interactive map:**

- **80 pin and posts**
- **22 posts were in support** of the project and/or elements of the project design
- **six (6) posts did not support particular features** on the concept designs and provided comments
- **49 additional comments** were provided.

Note: 22 individuals provided multiple submissions along with 19 anonymous respondents.

For details on responses via the interactive map, please refer to Methodology and Response on page 5.

It should be noted that this public exhibition was held close to the cut-off date for community engagement (acknowledgement of the approaching festive season and its recognised impact on the community's willingness to participate in Council's community engagement programs).

There were also many significant events which affected community attention, media coverage and social media engagement during this time including: the visit of the King and Queen to Parramatta; the US elections and Donald Trump as a candidate; Local Government elections; a new Parramatta Council; and Diwali.

Major Council programs also competed for the community's attention, including: the Lanes festival; the roll out of FOGO; the opening of Lake Parramatta and public art at Charles Street Square; the closure and clean of the Parramatta River (more than 60,000 views on social media); Foundation Day; Remembrance Day; and large Citizenship events (the first for the Lord Mayor and a number of Councillors).

Due to these events, the volume of projects etc. Council channels are congested, and despite segmenting where possible, various campaigns compete for residents' attention and limit the serve rate on social media. The frequency of Council messaging (across numerous projects) also causes a proportion of the community to switch off.

The monitoring of when campaigns are sent live, and the number of campaigns in market at one time, is continually highlighted as a consideration for community engagement.

3. Methodology and response

The ***Eastern Parramatta River*** project was hosted on the City of Parramatta's engagement portal, ***Participate Parramatta***, from **Monday 21 October to Thursday 21 November 2024.**

There were two main paths to provide feedback on the project online - dropping a pin and posting comments on the concept design via the interactive map, or participating in the short survey which detailed the proposed concept designs for each of the five (5) parks.

Emails, submissions via post and verbal submissions (primarily for people with disabilities) and comments via social media were also accepted.

Direct mail provided to residents within the catchment of the project, CBD and east, (approximately 6,000 businesses and homes) offered a direct link/QR code to the ***Participate Parramatta*** project page.

Other marketing materials, including social media, Council's website and eNewsletters, and signs at each of the parks, also used ***Participate Parramatta*** as the call to action, promoted by web links and a QR code.

Social media materials were presented in community languages (Arabic, English, Hindi, Korean, Simplified Chinese). Translation and TTY services were promoted to for assistance if required in the direct mail piece.

Participate Parramatta

The ***Eastern Parramatta River*** project page on ***Participate Parramatta*** contained information about the planned pedestrian and cycling path upgrades to be delivered as part of the project, with information on the native planting, lighting and other improvements planned for each of the five (5) parks. It offered resources including interactive maps, concept designs, delivery timeline, and answers to frequently asked questions etc.

Community Response

- The ***Eastern Parramatta River*** page on ***Participate Parramatta*** attracted **4,278 page views** and **2,443 unique visitors.**

- Of the **2,443 unique visitors** to Participate Parramatta, **2,255 were aware** (those who viewed the page, but didn't take action), **251 were informed** (those who viewed and took action), **65 were engaged** (those who completed the survey). See below for more information on definitions.

- Aware: Number of unique visitors who have viewed the project page, minus any visitors who have undertaken any activity e.g.: downloaded a document, viewed a video, completed a survey etc.
- Informed: Any unique visitor who has viewed a latest news item, viewed a document, viewed a video, viewed a FAQ minus any user that has engaged e.g.: completed a poll or survey, engaged with an interactive document.
- Engaged: Any unique visitor who has completed a poll, survey, ideas wall or engaged with interactive mapping.

Demographic data

It should be noted the section of community engagement surveys which seeks information on sex, age, and other demographic markers - including speaking another language, identifying as being Aboriginal or Torres Strait Islander, or living with a disability - is commonly the section where a high percentage of respondents exit the survey.

Overall, of **67 respondents, Parramatta** residents led the way **(27 submissions). Ermington** residents were the second largest cohort **(14)** followed by **North Parramatta (7)** and **Rydalmere (4).**

Out of **67 respondents, 32 answered** specific demographic questions, except for 'what is your relationship to City of Parramatta' and 'Live Work Play' question, where all **67 responded.**

Social and cultural associations only attracted one (1) respondent for each question.

What is your relationship to the City of Parramatta?

Those who submitted a formal response via Participate Parramatta (67) identified as:

- City of Parramatta residents – 58
- Rate payers - 20
- Those who work or study in the area - 15
- Business owners - 2.

*More than one option could be selected.

Live - geographical location

All 67 respondents answered this question. However, **47 elected** to choose 'prefer not to say' or 'none of the above' – options for with-holding details about where they lived.

- **Parramatta** led the way with **14 responses**, followed by Wentworth Point five (5) and North Parramatta four (4).

- Almost every suburb in the LGA was represented, with the survey attracting one (1) or two (2) respondents from each suburb. Six (6) acknowledged they lived outside the Parramatta LGA but indicated they visited/worked or studied in Parramatta.

- One respondent shared that they recently purchased a new home to be closer to these parks and the more pleasant commute along with recreational opportunities offered by pedestrian/cycle paths and the Parramatta River.

Sex

Only **32 from 67 respondents** answered this question.

- Seventeen **(17) respondents** identified as **male, 13 as female.** Others responded as 'other' or 'prefer not to say'.

- For some respondents, first names indicated gender and where possible this was used to add context to some of the responses.

Age

Overall, out of **67 submissions, 32 respondents** provided information on **age.**

- **Ten (10) respondents, seven (7) males and two (2) females, indicated** they were in the **35 - 44** age group. This age group was the highest overall who provided their age.

- The second highest number of respondents who identified their age group were from the **55-64** age group, **seven (7) participants, five (5) female** and **one (1) male.**

- In the **65 - 70** age group there were **five (5) respondents overall, three (3) male** and **one (1) female.**

- The **18 - 25** age group had **three (3) respondents overall, all male.**

- **In the 26 - 29** age group there was **one (1) respondent** overall, unidentified sex.

- The **71- 75** age group had **one (1) respondent** overall**, male.**

Social and cultural markers

- **Seventeen (17) people** shared that they speak a **language** other than English.

- **One (1) person** identified as **Aboriginal or Torres Strait Islander.**

- **One (1) person** shared they lived with a **disability.** They made special note that while some pedestrian paths were becoming more accessible, they would like to see more areas within the Parramatta LGA become more accessible.

Participate Parramatta interactions

- More than **250 visitors** took an action including downloading information
- **482 documents were downloaded including concept plans**
- The image gallery was viewed **189 times**
- The interactive map attracted **1,083 views** with **80 pin and post submissions.**

Concept designs views and downloads

- The **foreshore elevations** diagrams were downloaded **37 times**
- **Rangihou Reserve**, Parramatta concept plan was downloaded **110 times**
- **Baludarri Wetlands**, Parramatta concept plan was **downloaded 82 times**
- **Reid Park,** Rydalmere, concept plan was **downloaded 60 times**
- **Royal Shores**, Ermington, concept plan was **downloaded 75 times**
- **George Kendall Riverside Park**, Ermington, concept plan was **downloaded 102 times.**

Once on the Participate Parramatta project page **(4,278 views)**, only a small percentage will engage further with the project.

It is more usual for residents who do not support the project to provide feedback, along with those who would like to raise some concerns or provide a suggestion for improvement.

A smaller percentage of highly-engaged people will provide detailed responses and express excitement/strong support/welcome the project.

Social media is a quick response tool and is also used to ask questions about the project and to raise other issues. Though always encouraged, a number of residents who respond on social media platforms will not make the required link click to the engagement portal.

Social media feedback generally comes from a younger demographic (Instagram) and those already engaged with Council.

Community feedback via Participate Parramatta – survey results

From 4,**278 page views** and **2,443 unique visitors**, **67 surveys** were submitted.

Respondents were identified by captured IP addresses, though more than one visit from each household is likely. All bar six (6) respondents were City of Parramatta residents.

Eastern Parramatta River - overall response

- Of **67 residents** who completed the survey, **53 respondents (79%) were supportive** of the overall Eastern Parramatta River project, and the improvements as presented, to five (5) parks.
- Twelve (12) people (18%) supported the project to an extent.
- One (1) was unsure, and one (1) did not support.
- Fifty-three (53) respondents chose to make additional comments as part of their survey submissions, either as comments detailing why they supported particular elements to an extent, taking the last question opportunity to provide any further comments and via email.
- Three (3) emails were received including one (1) attachment, a lengthier response, was also provided.

Individual parks

When asked about the concept designs and proposed upgrades for each of the five (5) parks, all 67 respondents continued to provide feedback on the concept design for each park:

Rangihou Reserve Parramatta

- More than 73% (49 respondents) supported the concept design
- More than 16% (11 respondents) supported to an extent
- Four (6%) were unsure and three (4%) did not support.

Baludarri Wetlands, Parramatta

- More than 79% (53 respondents) supported the concept design
- More than 12% (eight respondents) supported to an extent
- Five (7%) were unsure and one (1%) did not support.

Reid Park, Rydalmere

- More than 84% (56 respondents) supported the concept design and proposed improvements
- More than 12% (five (5) respondents) supported to an extent
- Six (9%) were unsure. No residents (0%) said they did not support the proposed upgrade.

Royal Shores, Ermington

- More than 75% (50 respondents) supported the concept design and proposed improvements
- More than 16% (11 respondents) supported to an extent
- Six (9%) were unsure. No residents (0%) said they did not support the proposed upgrade.

George Kendall Riverside Park, Ermington

- More than 79% (53 respondents) supported the concept design and proposed improvements
- Twelve per cent (eight respondents) supported to an extent
- Four respondents (6%) were unsure. Two (3%) said they did not support the proposed upgrade.

Other responses

Social media campaigns generated **1,380 interactions,** the relevant comments were generally positive, with others seeking clarification on shared and expanded paths. There was one negative comment and one negative sentiment (unhappy face).

The project team working closely with the social media team, **providing five (5) social media responses to residents**. Each post included the reminder to visit ***Participate Parramatta*** for more information and to seek further assistance from the project team.

The ***Participate Parramatta*** **inbox** received **three (3) emails.**

Community feedback – via interactive map

1,083 viewers engaged with the interactive map, providing 80 pin and posts.

The overall and five (5) park interactive maps which featured on the ***Participate Parramatta*** project page, were a quick way for stakeholders to pin a location and flag whether they supported the item identified on the draft concept design or did not support. Residents could also post a comment.

During the exhibition period there were **1,083 interactions** with the map:

- **80 pin and posts**
- **22 posts were in support** of the project or elements of the project
- **six posts did not support *particular features* on the concept designs**
- **49 comments were** provided. Note: 22 individuals provided multiple submissions along with 19 anonymous respondents.

Engagement with interactive maps

Many of the **80 pin and posts** indicated support for the project overall, particularly upgrades which were seen as addressing safety concerns e.g. paths that were "steep, narrow and dark" or where there were "near misses" between pedestrians and cyclists.

Residents were also very supportive of more planting being added to the parks and a significant number of comments were requesting more trees and native shrubs in various locations. Lighting plans were also supported with requests for more lighting extending to particular locations the resident nominated – such as Western Sydney University.

Via social media there was a request to make the parks and pathways more accessible, and for more of the LGA to be accessible. There was also support for the key elements within the concept designs.

However, there remains a strong preference within the community for separate pedestrian and cycle paths (with vegetation between the two). Key comments/themes included:

Cycle and pedestrian paths

- The removal of narrow paths and identified pinch points was strongly supported. Along with the project's intent to create opportunities for residents and visitors to enjoy the five (5) parks and the foreshore area and add additional lighting and trees and plants.

- A number of concerns were raised around cyclists and pedestrians interacting and the need for more signage and/or behavioural change campaigns. Signs where cyclists had to give way to pedestrians, and signs advising pedestrians to keep to the left on shared paths were requested.

- Further investigations of the proposed paths at George Kendall were requested. Three residents highlighted the steep bend in the paths could cause unintended visibility issues and other potential safety concerns when descending from Goerge Kendall to Royal Shores. Path widening at Royal Shores was also raised.

- Replacing the existing curved shared path from Morton Street to the foreshore path, with a direct path, was questioned by one resident who felt it would cause people to start to walk across the grass - the most direct route to nearby homes.

- A concern was raised about widening some paths with a request to ensure there was no seam which could act as a hazard to cyclists.

- Treatments to flood prone areas (elevated boardwalk or similar) were requested in areas where water currently pools at George Kendall Reserve and Royal Shores.

- Bike racks were requested by a number of residents including locations such as near the café, playgrounds, at points of interest, and near shelters at George Kendall Reserve.

LED Lighting

- Lighting installation was enthusiastically endorsed by a number of respondents including one who identified some areas as "dark and spooky".

- Many residents requested that LEDs be installed the entire path to WSU and in other locations.

Planting

- Planting was unanimously supported with requests for more planting of trees and native shrubs and grasses in particular locations at various parks (and less turf).

- While there are few tree removals within the project, concerns were raised about the impact of tree removal (heat/shade, biodiversity, pollution) along with requests for more planting where possible.

- Specific mentions were made of the saltmarsh areas needing more care, rubbish removal and setting up a bushcare group for the area.

- Maintenance requests included cutting back or removing blackberry bushes on the old foreshore path in George Kendall which are overgrown, weeding and general upkeep.

- A note was made about a particular tree near Park Road which obscures views to the rest of the cycle path.

Other comments/requests:

- A new amenities block in Rangihou Reserve was requested. Other residents commented it would be nice but isn't needed. However, a number of respondents mentioned the lack of public amenities in these parks and across the LGA.

- A footpath connection from Rangihou Crescent to Rangihou Reserve.

- A request to consider widening the paths on Silverwater Bridge was made for future upgrades.
- Bridge repairs at Royal Shores were also requested, with claims wooden sections are rotten.
- Additional bins and dog poo bins/bags
- More water/drinking fountains
- Bike repair stations
- Fixing bumps in existing cycle paths.

Participate Parramatta survey comments

Of **67 survey** submissions, some of those supported concept designs to an extent and made comments. In total, **52** respondents elected to make comments to clarify their responses or took the opportunity to make further comments on the project.

Comments in the survey followed similar themes as those made in the interactive map.

There was strong overall support for the upgrades, particularly the addition of more separated cycleways and elements of the concept designs addressing safety concerns identified in existing paths, and the lack of lighting.

There was also recognition of the City's recent work on cycleways near George Kendall, the upgrades near Rydalmere Wharf.

The Parramatta Light Rail (Stage 1) Active Transport Link from Carlingford to Parramatta also received positive comments as did Alfred Street Bridge.

Requests to minimise tree removals and for additional trees, shrubs and native grasses were strongly represented in responses and additional comments. One respondent suggested a little less turf and more plants.

There were a small number of comments questioning the timeline for completion of this project and seeking more information on when each park will be delivered (this information was included on ***Participate Parramatta***). There were also concerns around potential park closures.

Cycling comments:

- Concerns about pedestrians who encroach on cycle paths and general comments about pedestrian and cyclist interactions were the most common responses within the survey.

- Dedicated/separated lanes for pedestrians and cyclists are strongly preferred by the community or otherwise planting to act as a divider on wide shared paths. Wide paths such as the Carlingford to Rydalmere share path were praised.

- Concerns about cyclist behaviour (speeding and not ringing bell, riding two across or more in a pack) and pedestrians in cycle lanes were the most frequently raised issue. Requests for more Ranger patrols and behaviour change campaigns, potentially with occasional Council pop-ups promoting cycling paths and safety. CCTV was also requested.

- Requests for more signage to assist in mitigating conflicts between pedestrians and cyclists including pedestrians keep left and cyclists slow down. Requests were also made for Council to consider speed humps in certain areas where speeding cyclists are an issue. One respondent suggested these should be at 45 degrees and offset to make them easier for people in wheelchairs and those pushing prams to navigate.

- Requests to ban e-scooters and e-bikes due to safety concerns for both pedestrians and cyclists and sign appropriately were also high.
  One respondent who identified as a regular commuter using these Eastern Parramatta River paths daily, commented on dangerous e-unicycle riders. Issues with e-bikes etc. was also raised via social media.

- There were also comments recommending Council should prioritise pedestrians and cyclists over motorists and a request to review existing paths and improve connections between paths across the LGA creating a complete network.

- Requests to mitigate noise on metal boardwalks – cyclists in particular, disturb some members of the community.

- Request to make bike racks and bike maintenance stands as part of the designs.

- Suggestion that Council should invest in connecting the path in Rangihou Reserve to Alfred Street Bridge.

- Request to keep the curved path in Rangihou Reserve to the to the south end of Morton Street and to add more native plants where the designs indicate paths are being removed.

- A comment requested that Council keep the path which was marked for removal in Rangihou Reserve, though the respondent was not sure if this was part of the concept design. There were also concerns about that area being dark.

- In commenting on Royal Shores, one respondent stated that it was unclear why if there is a pedestrian path, the adjacent path is a shared path. Suggesting it would be better to have a cycleway with crossings to shelters or other points of interest to minimise interaction and potential conflict of pedestrians and cyclists.

Additional features requested:

- Adding more water fountains, seats, rubbish bins, pet waste bins and biodegradable bags to the concept designs was a common theme.

- Addition of signage in multiple languages or using icons to warn people to collect their dog's poo. Also, Ranger Patrols to help control/fine failure to collect poo and control risky dog behaviour were requested. Apparently, both are issues in some parks.

- Requests for more planting particularly native trees and shrubs within the parks for shade, biodiversity, and aesthetics.

- Request for a public toilet in Rangihou Reserve and in Royal Shores and for upgrades to amenities in George Kendall Reserve – and for toilets to be open. A few people raised that the lack of amenities is inconvenient and results in people making use of trees, shrubs and bushes.

- The addition of picnic tables and BBQs. On social media, there was a request for signs near picnic tables/seats to reduce litter left behind.

- A playground in or near Rangihou Reserve particularly for all the apartment buildings in the area.

- The addition of outdoor gym equipment where possible.

Trees and environment:

- Overall, more planting, and planting to create park areas was strongly supported.

- There was some concern around the removal of eight (8) trees in Rangihou Reserve citing impact on biodiversity and wildlife etc. Also comments about the need for environmental rehabilitation of Rangihou Reserve protecting the saltmarsh areas. There was one comment about the location of newly planted trees in George Kendall Reserve – in seemingly random places.

- Maintenance was raised numerous times as an issue which disturbs the community. Cutting back plants near and overhanging paths, cleaning up rubbish on land and in the river, in the mangroves etc. Dealing with dog poo on grassed areas and overflowing or unemptied bins were also raised by a few respondents.

- There was a request for attention to areas in Royal Shores which regularly flood.

- Landscape maintenance near the sea wall at Royal Shores was mentioned as being overgrown, blocking the pedestrian path and looking shabby.

- Concerns about the lack of environmental protection provided to Baludarri Wetlands, particularly the impact of lighting and other stressors to native animals.

- Mosquitos and rats were also raised as barriers to using paths especially at night.

Lighting:

- Requests to repair a light which has failed in George Kendall Reserve. Numerous respondents requested Council consider more lighting than is indicated on the concept designs. Specific requests were made for additional lighting at George Kendall, Reid Park, Rangihou Reserve and Royal Shores.

- There was a comment that the brightness of the lights on this project should be carefully considered.

Out of scope and service requests:

- Upgrades to the soccer ovals at George Kendall Reserve were requested.

- There was a request for streetlighting to be improved on Ermington Street.

- A request to remove the bin at the top of Broughton Street. This resident detailed that the Council rubbish bin, next to the Promenade units, attracted people dumping rubbish. They also reported that the bins were not emptied. They suggested CCTV to deter illegal dumping, including abandoned shopping trolleys. The also requested better lighting for the stairs.

- A lack of public toilets in the LGA and requests for more amenities in these parks and elsewhere were significant themes. Many respondents commented about inconvenience and having to use the bushes. Specific mentions of the need for a public amenity building somewhere between Charles Street Square and the Bigee Bigee Bridge (James Ruse Drive Bridge) and between Parramatta Quay and Rydalmere Wharf were made.

- A respondent commented on poor lighting from Rydalmere Wharf to Silverwater Bridge.

- Safety concerns along the Parramatta Valley Cycleway were raised with a request for review and to consider safety points where people could call for help. This resident also urged Council to consider these in other pedestrian/cycle paths in locations which didn't offer close access to help.

- Comments that the trees near Alfred Street Bridge were in need of more watering and maintenance/replacement, and that the area needed more planting where possible.

- Another resident commented that there is a large area which was used for building the Alfred Street Bridge which is now just an abandoned waste site. They stated that this area is meant for enjoyment of the community and Council should address this as a priority or as a part of this project.

- Request for a child safe play area in the Council land in/near MacArthur Street and to create public spaces with native trees and plants.

- A comment was made about the brightness of the lights from the ferry in the CBD to Powerhouse Parramatta (with a request to investigate reducing the brightness if possible).

- There was one suggestion for Council to consider small wharfs in appropriate locations – including Royal Shores at the bottom of Spurway Street was made - though the response doesn't make clear whether this is for private craft or ferries.

- Consider small dog parks to be introduced in larger parks.

- There was one unusual request to consider pedestrian paths being made of softfall, providing benefits for walkers and as a deterrent to cyclists.

Recommendations

On reviewing residents' input from both the interactive map and the survey, it is recommended that the project team:

- Review particular locations where residents have raised there may be potential safety concerns (visibility, steepness, cyclists travelling at highspeed, problematic intersections, the angle of the path, low lighting, concerns, the proposed configuration of paths at particular points, and other related issues) and adjust the concept designs where possible. See raw data sheets for extra details on the GPS location of identified locations and extended comments for more information. Advise respondents on outcomes regarding their particular concerns.

- Review and implement requests to see more planting across the parks and minimise tree removal as much as possible. Update respondents via ***Participate Parramatta.***

- Consider whether bike racks, bike repair stands, water fountains and bins can be added to the designs to enhance the proposed upgrades and/or identify these as a priority for future works. Update respondents via ***Participate Parramatta.***

- Review the LED lighting plan and note other areas where residents have requested lighting in these concept designs, adjust plans or include in later works advising those residents who expressed concerns about the lighting as a risk to the community. Update respondents via ***Participate Parramatta.***

- Ensure LED lighting is collared, warm, at appropriate brightness and otherwise managed (e.g. timers) so it improves safety for pedestrians and cyclists with minimal light spill affecting neighbouring residents and wildlife. Include measures in ***Participate Parramatta*** updates.

- Discuss maintenance issues raised by residents with appropriate **City of Parramatta teams**, and lodge **Service Requests** for trimming/removal of blackberry, rubbish removal and maintenance of saltmarsh areas and other issues such as the repair of wooden bridges and noise mitigation around metal boardwalks, as well as fixing some concrete panel displacement in George Kendall). Review public amenity requests, potentially identifying future works. The follow-up of request/ liaison with residents and the works to be completed by relevant teams.

- Requests for signage and Ranger patrols should also be considered along with behaviour management campaigns for pedestrians and cyclists. **Liaise with Rangers/Regulatory.** Advise outcomes via ***Participate Parramatta*** and consider signage and an enforcement blitz, pop-ups, along with social media to promote the campaigns.

Closing the loop – keeping the community informed

The project team is working through submissions made during the public exhibition period and will respond to residents and stakeholders who have raised specific location-based concerns.

A project update advising the close of the consultation has been published. An update highlighting some of the feedback received and further information on the delivery program will be uploaded to the City of Parramatta website (with a link from Participate Parramatta) as soon as possible.

Further updates will report on how the concept design has been fine-tuned to accommodate feedback/suggestions where possible.

Additional and ongoing project updates will be published on the City of Parramatta website when the Eastern Parramatta River project begins early works in preparation for construction.

A button on the Participate Parramatta page will link to the project page on the Council website.

Residents who have elected to follow the project (by clicking on the follow button on the Participate Parramatta project page) will receive updates.

Social media may be used at some points to promote the work being undertaken to deliver upgrades to the five (5) parks which are part of the Eastern Parramatta River project.

Project updates will also be provided for consideration for inclusion in various eNewsletters and Council publications.

Community/media events with stakeholders, funding partners and the community will be planned for each park over the staged completion of works with associated media releases and marketing materials.

4. Engagement activities

Numerous communication channels were activated to reach as many community members within the catchment area as possible and encourage them to engage with the ***Eastern Parramatta River*** project. Marketing materials, including advertising and letters, offered a link directly to ***Participate Parramatta*** or included a QR code linking to the project page on the platform.

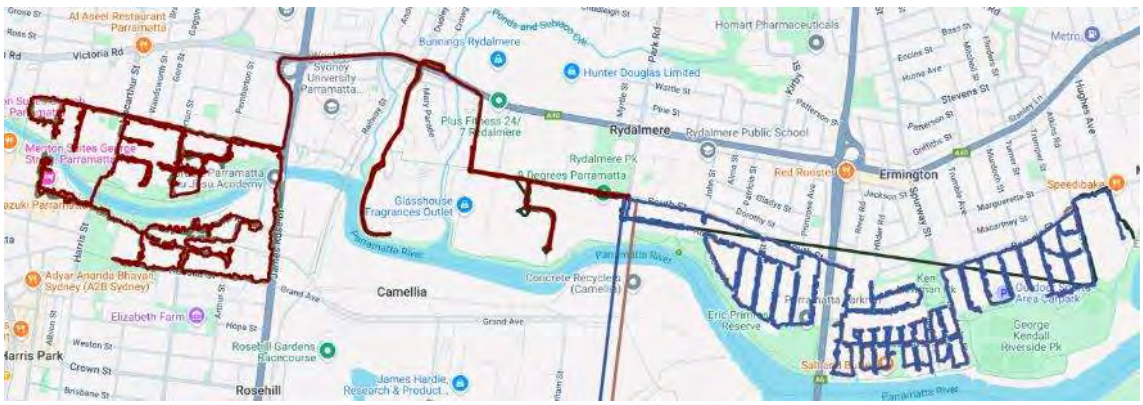
QR scans

Direct mail and signage featured a QR code – the code was scanned **397 times.** during the campaign.

Direct mail

Commencing with a letter in late-October, around **6,000 households** in the project area were targeted with materials promoting the proposed upgrades, and the opportunity to have a say on the ***Eastern Parramatta River*** project.

Specialised print and distribution was co-ordinated with a team of walkers hand-delivering project collateral. GPS live-tracking of the distribution was conducted. Additional stakeholders were also contacted including cycling affiliations and NSW Government agencies.



GPS tracking of letterboxing to approximately 6,000 homes and businesses.

Media release

A media release outlining the benefits of the Eastern Parramatta River project and encouraging the community to have a say, was produced and distributed to local media.

The media release was also uploaded to the City's website and attracted **43 views.**

The media release resulted in **three media articles:**

- Mirage News
- The National Tribune
- Inside Local Government.

Advertising

Parramatta News is a local community newspaper (digital and print) with reach across the LGA and beyond. The 29 October 2024 edition carried both a quarter page advertisement and a feature piece within the Lord Mayor's Column.

For media release, editorial and advertising, please see Appendix A on page 42.

City of Parramatta social media - Facebook and Instagram

Individual metrics for each social media platform (Facebook and Instagram) are contained below and in detailed reporting in Appendix A on page 42.

The campaign included organic posts (unpaid) on City of Parramatta channels and a paid advertising schedule for LGA and target suburbs ($500 budget in total).

Ads were provided in Arabic, English, Hindi, Korean and Simplified Chinese (targeting residents in the catchment area with those language settings).

While organic and paid posts were LGA-wide a portion of the budget for paid posts were geo-targeted focussed on the catchment area for the five (5) parks within the project.

City of Parramatta Facebook page **(45K+ followers)** and **Instagram (18.1K followers)** were used (along with other Council social media channels).

The figures below relate only to the City of Parramatta accounts.

- **Total impressions** for the entire campaign (including paid and organic on both channels) was **60,883**
- The campaign generated **1,380 post interactions** across organic and paid (including total interactions, link clicks, comments, likes, shares etc across all posts)

- ***Eastern Parramatta River*** attracted mostly positive sentiments - likes and loves, with only one sad face.
- The majority of relevant comments received were **generally positive**. Others sought clarification on shared or dedicated paths or made a suggestion for inclusion in the project scope. There was one negative comment which did not support the project, considering it a waste of resources due to the community's incorrect use of pedestrian and cycle paths.
- Five **social media responses** were provided to the community, each included the reminder to visit ***Participate Parramatta*** for more information and to provide formal feedback.

Demographic data

- Men aged 35-44 were the overall top performing demographic, making up 14% of total results.
- Results were evenly distributed between age groups, with 65+ the top performer at 24%, 35-44 and 45-54 both with 21% and 55-64 with 20%.
- Men accounted for 58% of link clicks vs. 40% women.

The profile of social media responses appears to align with cycling demographics.

Organic campaign (unpaid)

The organic (unpaid) Facebook and Instagram campaign – two (2) Facebook and two (2) Instagram posts - resulted in **11,393 impressions**, a **reach of 10,576**, with **315 engagements,** an **engagement rate of (2.76%) – above benchmark levels** - and **74 link clicks**.

- Overall, Facebook **reactions were positive** attracting **39 likes** and **four (4) loves**
- Instagram attracted **75 likes**
- Three comments were left across organic posts, two were positive, with one person leaving a 😍 emoji, and the other mentioning that this area is part of the Greater Sydney Bike Trail
- One negative comment mentioned that separated bike/pedestrian paths are not used as intended and are a waste of resources.

Social media summary

Metric	Campaign Result	Benchmark
Number of Posts	4 (2x IG, 2x FB)	n/a
Engagements	315	n/a
Reach	10576	n/a
Impressions	11393	n/a
Link Clicks	64	n/a
Engagement Rate	2.76%	2-3%
Total Instagram Reactions	75 Likes	
Total Facebook Reactions	👍: 39 ❤️: 4	

Instagram story

The one organic **Instagram story** deployed within the campaign generated **1,137 impressions** and a **reach of 1,137**. It achieved an **engagement rate of 1.6%** with **18 engagements** and **10 link clicks.**

Metric	Campaign Result	Benchmark
Number of Posts	1x IG Story	n/a
Engagements	18	n/a
Reach	1137	n/a
Impressions	1137	n/a
Link Clicks	10	n/a
Engagement Rate	1.6%	n/a

Paid campaign – overall

The paid ***Eastern Parramatta River*** campaign generated **48,353 impressions** (overall), **a reach of 23,950** and **1,047 post engagements, (2.2%) – above benchmarks.**

There were **908 link clicks** to the project page on ***Participate Parramatta*** **(1.88%) - above benchmarks.**

Reactions overall were **positive** with **112 likes, seven (7) loves and one (1) frown face** directed towards the project.

There were two main components to the paid campaign, LGA wide (excluding target suburbs), and target suburbs, with languages targeted within the two streams.

LGA wide (excluding target suburbs)

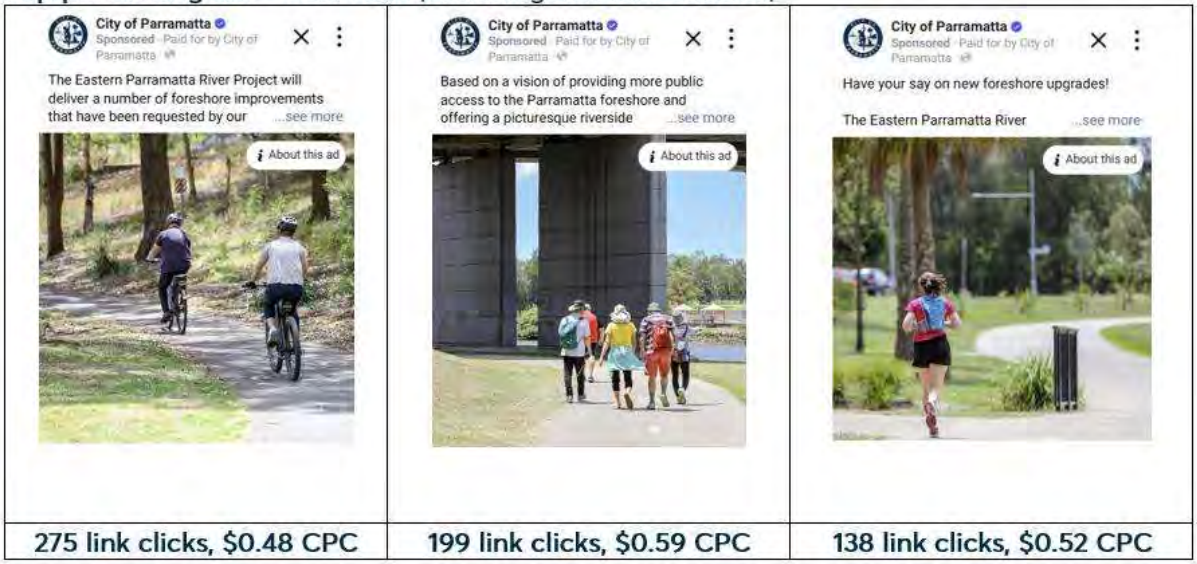
With an investment of approximately $350, the various posts as part of this LGA campaign generated **38,838 impressions**, a **reach of 19,006, 761 post engagements** and an **engagement rate of 1.96%** - closely approaching the 2% benchmark. The campaign delivered a **1.68% click through rate,** more than the 1% benchmark.

The **top performing ad** from the paid **LGA wide ad set** was the foreshore improvements ad **(275 link clicks).** However, all ads delivered good click through (654 in total) and post engagements (761).

Meta Summary – LGA Wide (Excluding Relevant Suburbs) AdSet

Metric	Campaign Result	Benchmark
Spend	$349.36	n/a
Reach	19,006	n/a
Impressions	38,838	n/a
Frequency (no. times ad seen p/p)	2.04	2-3
Link clicks	654	n/a
CPC (cost per click)	$0.53	$0.50-$1
CTR (click through rate)	1.68%	More than 1%
Post engagements	761	n/a
Engagement rate (ER)	1.96%	More than 2%

Top performing ads - LGA Wide (Excluding Relevant Suburbs)



275 link clicks, $0.48 CPC	199 link clicks, $0.59 CPC	138 link clicks, $0.52 CPC

Paid Advertising – Facebook targeted suburbs

A small percentage of the campaign spend (approximately $150) was targeted to key suburbs with closer proximity to the five (5) project areas.

The campaign focussed on targeted suburbs generated **9,515 impressions** and a **reach of 5,479**, achieving **286 post engagements**, an **engagement rate of 3.01%** (above 2% benchmark) and **254 link clicks.**

The **top performing ad** in the targeted suburb campaign attracted **226 link clicks.**

This was the strongest performing campaign. Future campaigns for ***Eastern Parramatta River*** will direct more budget to the targeted suburbs, with another ad set highlighting each park for the suburb in which the park is located.

Top performing targeted suburb Facebook ads

<table>
<tr>
<td> 
</td>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>226 link clicks, $0.56 CPC</td>
<td>27 link clicks, $0.79 CPC</td>
<td>1 link clicks, $0.90 CPC</td>
</tr>
</table>

Meta Summary – Relevant Surburb AdSet

Metric	Campaign Result	Benchmark
Spend	$148.88	n/a
Reach	5,479	n/a
Impressions	9,515	n/a
Frequency (no. times ad seen p/p)	1.74	2-3
Link clicks	254	n/a
CPC (cost per click)	$0.59	$0.50-$1
CTR (click through rate)	2.67%	More than 1%
Post engagements	286	n/a
Engagement rate (ER)	3.01%	More than 2%

Participate Parramatta social media - Facebook and Instagram

An organic (non-paid post) was shared on Council's ***Participate Parramatta Facebook*** page **(6,900+ followers)** and on its ***Instagram page*** **(620 following).**

The organic posts invited the community to learn about the ***Eastern Parramatta River*** project and have their say on the draft concept plans for the five (5) parks included in the project.

- The ***Participate Parramatta Facebook*** post **reached 111 people (192 views)** creating **seven (7) engagements** (likes, comments, clicks or shares) and **three link clicks**
- The ***Participate Parramatta Instagram*** **reached 34 people (62 views)** creating **seven (7) engagements.**

Active Parramatta Facebook

Active Parramatta is managed by Council's team who promote recreational activities and the Parramatta bus which travels to various locations across the LGA to conduct health classes and social inclusion activations.

- An organic (non-paid post) was shared on Council's ***Active Parramatta Facebook*** page **(4.6K followers)**
- The post **reached 657 people**, creating **eight (8) engagements, 1 like, 1 comment,** and **six (6) link-clicks.**

Participate Parramatta has 6,900 Facebook followers. The post reached 111 people (192 views) creating seven (7) engagements and three (3) three link clicks.

Active Parramatta has 4.6K followers. The Eastern Parramatta River post reached 657 people, creating eight (8) engagements, 1 like, 1 comment, and six (6) link-clicks.

External Social Media

Parramatta News

Parramatta News Facebook page has 2.6K followers. This post on 29 October carried links to that week's digital publication which included information on the Eastern Parramatta River project. Note other data unavailable.

For detailed reporting on social media and comments, please see Appendix B on page 51.

City of Parramatta eNewsletters

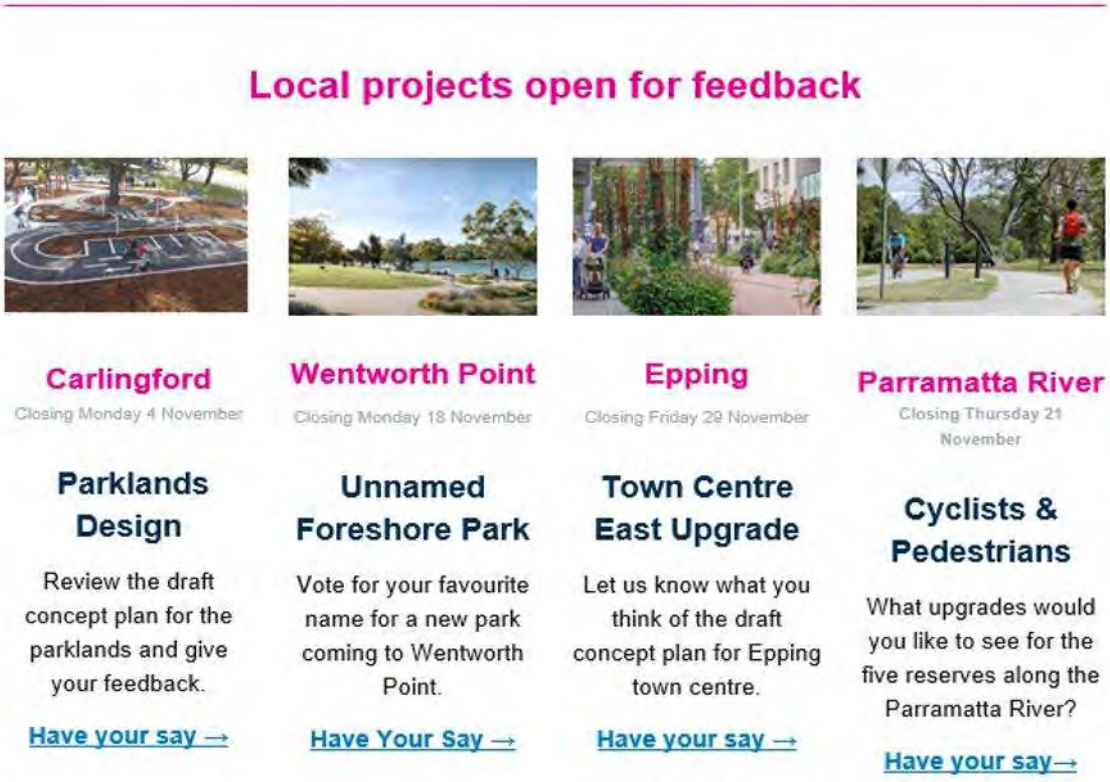
Participate Parramatta eNewsletter

An email was sent to Council's database of community members who have expressed interest in hearing about engagement opportunities. This email promotes the opportunity to share feedback on a range of Council projects.

The ***Eastern Parramatta River*** project featured in the October and November editions distributed on 31 October, 14 November 2024.

The monthly eNews is received by **18,000+ people.**

Links within the eNews take subscribers to the relevant ***Participate Parramatta*** project page, with **130 people clicking through** to the project page in October and **119 people clicking** on the story in the November edition.



Participate Parramatta eNews 31 October - 18,000+ subscribers, 130 clicks.

Closing soon

Wentworth Point

Closing Thursday 21 November

Unnamed Foreshore Park

Vote for your favourite name for a new park coming to Wentworth Point.

Have Your Say →

Parramatta River

Closing Thursday 21 November

Cyclists & Pedestrians

What upgrades would you like to see for five reserves along the Parramatta River?

Have your say→

Epping

Closing Friday 29 November

Town Centre East Upgrade

Let us know what you think of the draft concept plan for Epping town centre.

Have your say →

Whole LGA

Closing Sunday 1 December

Community Satisfaction

Help Council improve our services including waste, library, and parks by giving us your rating.

Have your say →

Participate Parramatta eNews 14 November - 18,000+ subscribers, 119 clicks.

City of Parramatta Your City News

The **Your City News** is distributed each month via email to subscribers.

The **November 2024** edition was received by **31,902 people** and **had a 38% open rate** with **141 people, (5%) of all clicks, leading to** the ***Eastern Parramatta River*** story.

Visit our other sites **At Parramatta** | **Riverside Theatres**

PARRAMATTA YOUR CITY NEWS

Welcome to Your City News

Each month we'll bring you the latest Council news, including updates on Council initiatives, developments and programs. Don't forget to update your preferences so we can deliver your favourite topics of interest straight to your inbox.

Have your say on five foreshore parks

Council is excited to present the Eastern Parramatta River project and invites residents to review and comment on concept designs for five foreshore parks. Many of the proposed upgrades were requested by the community and include 2.8 km of path upgrades, as well as LED lighting and native landscaping in some parks. Have your say before **5pm** on **Thursday 21st November 2024**.

Share your feedback

Your City News November – 31,902 subscribers, the Eastern Parramatta River story attracted 141 clicks – 5% of total clicks.

Council's corporate website

During the live period from **21 October to 21 November 2024**, there were **56,098 visits to the City of Parramatta homepage**, with a dwell time of **40seconds.**

With a web slider on the home page, inclusion on the River Transformation page (Vision) as well as Eastern Parramatta River project pages, a on exhibition page, mention on the Community Engagement page, and a media release, there were a number of avenues for people to find out about the Eastern Parramatta River project.

There were more around **14,800 views/visits** to various pages promoting the ***Eastern Parramatta River*** project (including the carousel slider).

Traffic to the pages largely came via organic searches, direct links to the pages e.g. QR code and social media.

Home page carousel slider

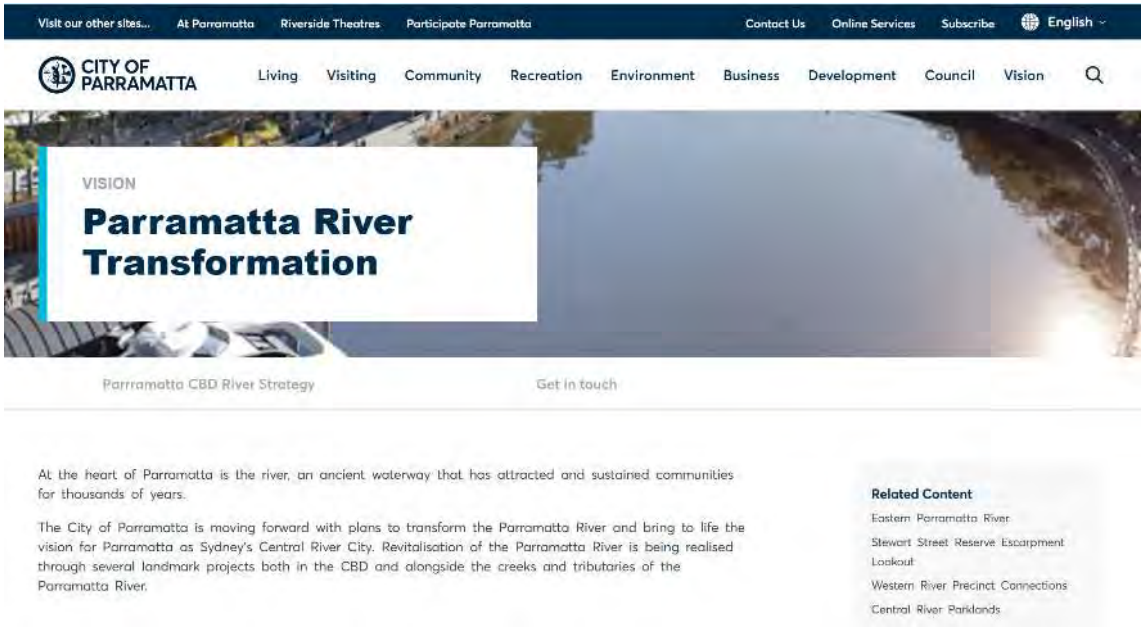
City of Parramatta homepage carousel slider attracted 14 clicks.

The homepage **carousel slider** is highly-visible prime real estate on the City of Parramatta website. The carousel usually cycles through four (4) high-profile initiatives/events.

The ***Eastern Parramatta River*** slider was live from **Tuesday 22 October to Monday 11 November 2024** and attracted **14 clicks** through to the project page.

City of Parramatta website - Eastern Parramatta River project pages

River Transformation page

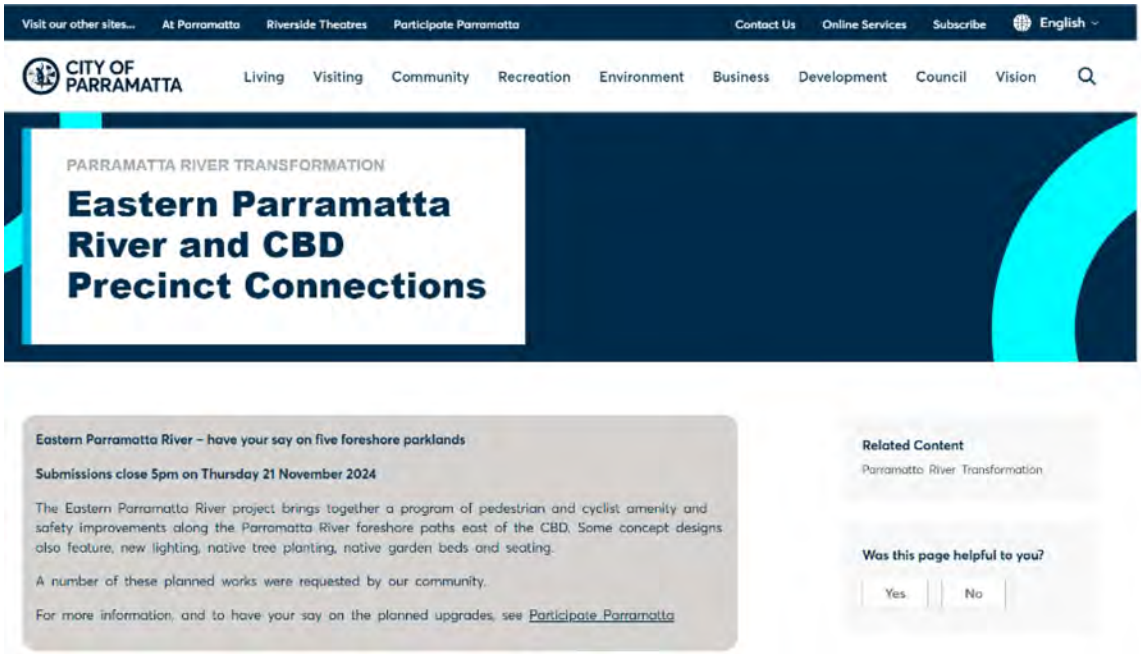


During the public exhibition period, the Parramatta River Transformation page attracted **240 views.**

https://www.cityofparramatta.nsw.gov.au/vision/parramatta-river-transformation

Users spent an average of **1m7sec** on the page finding the project they were interested in, reading a short paragraph describing the project, and clicking through to the project pages including Parramatta River CBD Connections and Eastern Parramatta River project page.

Eastern Parramatta River and CBD Connections page

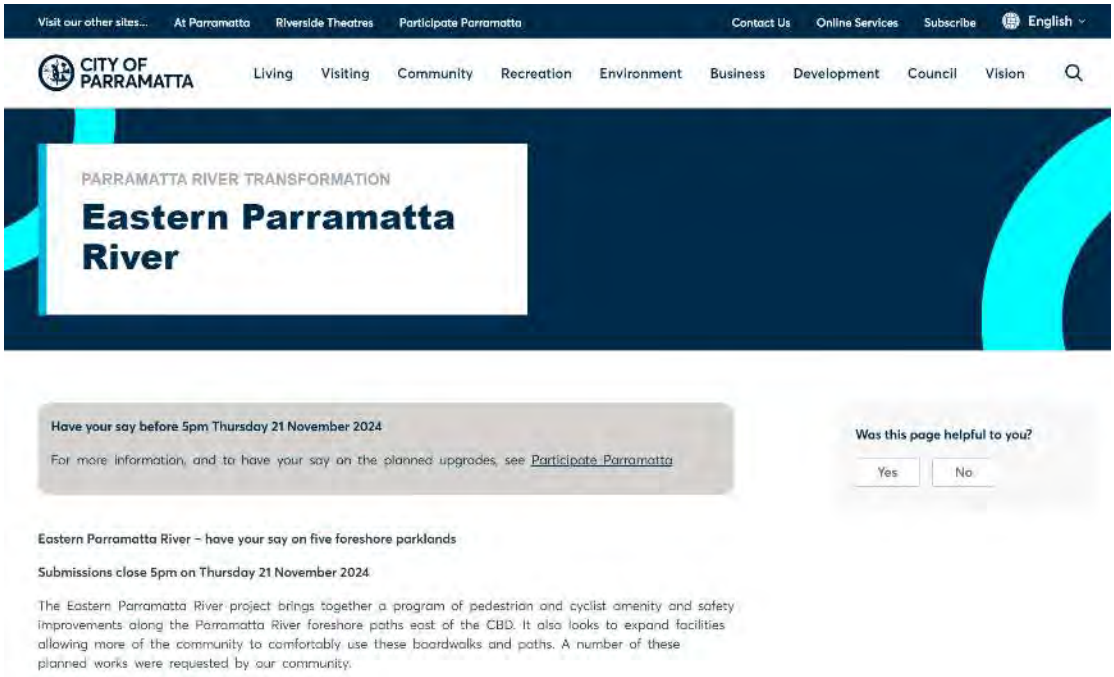


The Eastern Parramatta River and CBD Precinct Connections page attracted **116 views** with a **dwell time of 28 seconds.**

https://www.cityofparramatta.nsw.gov.au/vision/parramatta-river-transformation/eastern-parramatta-river-and-cbd-precinct-connections

The page also carried a splash box highlighting the opportunity to have a say on the project. A live link took visitors to the ***Participate Parramatta*** project page.

The Eastern Parramatta River project page



During the live consultation period, the ***Eastern Parramatta River*** project page attracted **83 views.**

https://www.cityofparramatta.nsw.gov.au/vision/parramatta-river-transformation/eastern-parramatta-river

The dwell time on this page was **more than 30 seconds (0:32s)** with clicks to the ***Participate Parramatta*** project page.

The page also carried a splash box highlighting the opportunity to have a say on the project. A live link took visitors to the ***Participate Parramatta*** project page.

Community Engagement page

We encourage you to get involved and have your voice heard!

Current engagement opportunities	Consultation Closure Dates
Carlingford Parklands Design - Draft Concept Plan (Stage Two Consultation)	5pm on Monday 4 November 2024
Public Exhibition of the Draft Community Engagement Strategy (2024 - 2028)	5pm on Thursday 7 November 2024
Public Exhibition of Eastern Parramatta River Cyclist and Pedestrian Improvement Project	5pm on Thursday 21 November 2024
Community Satisfaction Survey	Sunday 1 December 2024
Renewing the Community Strategic Plan	5pm on Monday 16 December 2024

The ***Eastern Parramatta River*** **project** was also included on the **'Community Engagement – Have your say'** page on Council's website.

Providing a short description of each project, this page directs people to current opportunities to have a say on Participate Parramatta.

https://www.cityofparramatta.nsw.gov.au/community/community-engagement-have-your-say

There were **342 page views** during the live period with a dwell time of **28 seconds.**

Nine (9) people clicked through to the ***Eastern Parramatta River*** project page on ***Participate Parramatta.***

On exhibition page

Eastern Parramatta River also featured on the **On Exhibition page** of Council's website attracted **44 views** with an average **dwell time of 11 seconds.**

www.cityofparramatta.nsw.gov.au/about-parramatta/news/on-exhibition/eastern-parramatta-river

News page – media releases, media coverage and advertising

Media release and media coverage

The Eastern Parramatta River **media release** was loaded to Council's website and distributed to local media outlets.

www.cityofparramatta.nsw.gov.au/about-parramatta/news/media-release/help-shape-the-future-of-parramattas-river-foreshore

The release "Help shape the future of Parramatta's foreshore" attracted **43 views on Council's News page** with an **average dwell time of 17s.**

As a result of the media release, editorial coverage appeared in the following publications:

- Mirage News
- Inside Local Government
- National Tribune.

Advertising

Advertising promoting the project was taken out in ***Parramatta News***, with a quarter page ad and inclusion in the Lord Mayor's Column appearing in the digital and online editions for 29 October 2024.

For media release, editorial, and advertising, please see Appendix A on page 42.

Customer service and officer responses

Prior to the public exhibition period, the City's Customer Service Centre was provided with information on the ***Eastern Parramatta River*** project allowing them to answer questions and/or direct calls to the project team.

Customer Service report taking **zero calls** related to the project.

The ***Participate Parramatta*** inbox received **three emails** about the project including one submission.

Signage

A1 signs were installed in high traffic locations in each of the five (5) parks featuring within the ***Eastern Parramatta River project.***

Signs were installed on Friday 18 October and remained throughout the consultation period, removed on Friday 22 November 2024.

While it is difficult to estimate foot traffic and visits to the parks, anecdotally the parks are usually very busy, particularly on weekends, attracting recreational cyclists and pedestrians.

The QR code was **scanned by community members 397 times.**

A1 signage was installed in various locations in the five (5) parks and removed following the closure of the community consultation period. All corflutes are recycled.

5. Appendix A

Media release, media articles and advertising

MEDIA RELEASE / 22 OCTOBER 2024

Help shape the future of Parramatta's river foreshore

Share

Parramatta River's foreshore is set to become even more pedestrian and cyclist friendly with the community invited to have their say on the proposed $9 million Eastern Parramatta River project.

The project is set to deliver 2.8 kilometres of upgraded pathways along the Parramatta River across five locations in Parramatta, Rydalmere and Ermington.

City of Parramatta Lord Mayor Cr Martin Zaiter said community feedback is at the heart of this project.

"Parramatta River is one of our City's best natural assets. This project aims to make it more accessible for people to jump on a bike or go for a walk or a run along its foreshores," Cr Zaiter said.

"The shared or separated paths will make it easier and safer for everyone to enjoy these scenic areas.

"Your voice matters. Many of the components in this project were requested by our community, and we want to hear how we can ensure these proposed improvements best serve your needs."

Works planned as part of the Eastern Parramatta River project include:

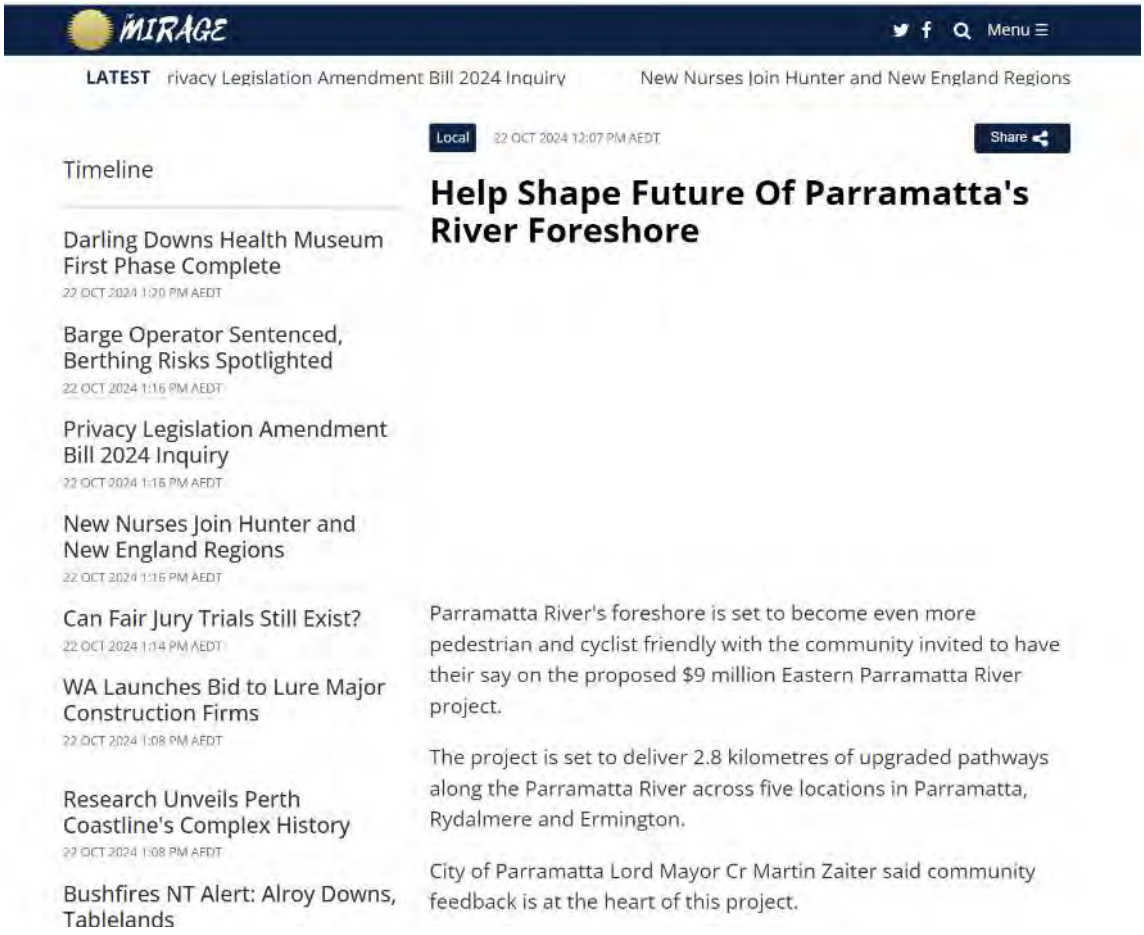
- **Rangihou Reserve, Parramatta:** upgraded shared path to a foreshore promenade for 450m
- **Baludarri Wetlands, Parramatta:** eco-friendly sensitive lighting on handrails and 25 light poles
- **Reid Park, Rydalmere:** separated pedestrian and cyclist paths for 300m through the park
- **Royal Shores, Ermington:** separate pedestrian path for 850m and a new lightweight bridge
- **George Kendall Riverside Park, Ermington:** separated pedestrian and cyclist paths for 275m.

The project is funded by the NSW Government through the Western Sydney Infrastructure Grants Program (WSIG) with the City of Parramatta. The Eastern Parramatta River project will begin construction in the second half of 2025, with completion expected by mid-2027.

Residents can share their feedback on concept designs via Participate Parramatta until **5pm on Thursday 21 November**.

Media articles

- Mirage
- Inside Local Government
- National Tribune



MIRAGE

Menu

LATEST rivacy Legislation Amendment Bill 2024 Inquiry New Nurses Join Hunter and New England Regions

Timeline

Darling Downs Health Museum First Phase Complete
22 OCT 2024 1:20 PM AEDT

Barge Operator Sentenced, Berthing Risks Spotlighted
22 OCT 2024 1:16 PM AEDT

Privacy Legislation Amendment Bill 2024 Inquiry
22 OCT 2024 1:16 PM AEDT

New Nurses Join Hunter and New England Regions
22 OCT 2024 1:16 PM AEDT

Can Fair Jury Trials Still Exist?
22 OCT 2024 1:14 PM AEDT

WA Launches Bid to Lure Major Construction Firms
22 OCT 2024 1:08 PM AEDT

Research Unveils Perth Coastline's Complex History
22 OCT 2024 1:08 PM AEDT

Bushfires NT Alert: Alroy Downs, Tablelands

Local 22 OCT 2024 12:07 PM AEDT Share

Help Shape Future Of Parramatta's River Foreshore

Parramatta River's foreshore is set to become even more pedestrian and cyclist friendly with the community invited to have their say on the proposed $9 million Eastern Parramatta River project.

The project is set to deliver 2.8 kilometres of upgraded pathways along the Parramatta River across five locations in Parramatta, Rydalmere and Ermington.

City of Parramatta Lord Mayor Cr Martin Zaiter said community feedback is at the heart of this project.

INSIDE LOCAL GOVERNMENT
News, Information and Events for Local Councils throughout Australia

INFRASTRUCTURE PUBLIC WORKS NEWS NSW NEWS

$9m Parramatta River foreshore plan unveiled

22/10/2024

LATEST ARTICLES

NEWS

21 dogs euthanised after parvovirus outbreak

NEWS

The project is set to deliver 2.8 kilometres of upgraded pathways along the Parramatta River across five locations in Parramatta, Rydalmere and Ermington.

City of Parramatta Lord Mayor, Martin Zaiter said community feedback was at the heart of the project.

Parramatta River's foreshore is set to become even more pedestrian and cyclist friendly with the community invited to have their say on the proposed $9 million Eastern Parramatta River project.

“Parramatta River is one of our City’s best natural assets. This project aims to make it more accessible for people to jump on a bike or go for a walk or a run along its foreshores,” Lord Mayor Zaiter said.

“The shared or separated paths will make it easier and safer for everyone to enjoy these scenic areas.

“Your voice matters. Many of the components in this project were requested by our community, and we want to hear how we can ensure these proposed improvements best serve your needs.”

Works planned as part of the Eastern Parramatta River project include:

- **Rangihou Reserve, Parramatta:** upgraded shared path to a foreshore promenade for 450m;
- **Baludarri Wetlands, Parramatta:** eco-friendly sensitive lighting on handrails and 25 light poles;
- **Reid Park, Rydalmere:** separated pedestrian and cyclist paths for 300m through the park;
- **Royal Shores, Ermington:** separate pedestrian path for 850m and a new lightweight bridge;
- **George Kendall Riverside Park, Ermington:** separated pedestrian and cyclist paths for 275m.

The project is funded by the NSW Government through the Western Sydney Infrastructure Grants Program (WSIG) with the City of Parramatta. The Eastern Parramatta River project will begin construction in the second half of 2025, with completion expected by mid-2027.

Residents can share their feedback on concept designs via Participate Parramatta until 5pm on Thursday 21 November.

THE NATIONAL TRIBUNE

Help Shape Future Of Parramatta's River Foreshore

NSW | 22 Oct 2024 11:06 am AEST

Parramatta River's foreshore is set to become even more pedestrian and cyclist friendly with the community invited to have their say on the proposed $9 million Eastern Parramatta River project.

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- George Kendall Riverside Park, Ermington: separated pedestrian and cyclist paths for 275m.

The project is funded by the NSW Government through the Western Sydney Infrastructure Grants Program (WSIG) with the City of Parramatta. The Eastern Parramatta River project will begin construction in the second half of 2025, with completion expected by mid-2027.

Residents can share their feedback on concept designs via *Participate Parramatta* until 5pm on Thursday 21 November.

Advertising – Parramatta News

With distribution across the Parramatta LGA and beyond, *Parramatta News* is a community-focused print and digital publication with strong readership.

In the 29 October 2024 editions, the *Eastern Parramatta River* project featured in a quarter page advertisement and within the Lord Mayor's Column.

Parramatta News also promotes its weekly papers on its **Facebook** page where people can read a digital version of the print edition. Parramatta News has 6.2K Facebook followers.

Quarter page ad, Parramatta News 29 October 2024.

PARRAMATTA

29 OCTOBER 2024

YOUR CITY NEWS

Children enjoy their first swim at Lake Parramatta.

LAKE PARRAMATTA SWIMMING AREA OPENS

It's swim season and we've got the perfect place to cool off here in City of Parramatta. Last Friday I re-opened Lake Parramatta's swimming area, a true paradise where the bush meets the water only minutes from our CBD.

We have turned this swimming spot into a gently sloping sandy beach with more shade, a new lifeguard platform and more trees and native plants.

Safety is our priority with new signage, an onsite emergency response beacon, and lifeguards now on patrol from 10am to 7pm on weekends. From Saturday 30 November to Thursday 30 January 2025, lifeguards will be on duty seven days a week from 10am to 7pm.

You'll find more details here: **cityofparramatta.nsw.gov.au/recreation/swimming-at-lake-parramatta**

I know I'll check it out with my family this summer so I hope to see you there, making a splash!

Cr Martin Zaiter
Lord Mayor
City of Parramatta

DIVE INTO PARRAMATTA'S HISTORY ON FOUNDATION DAY

A free fun-filled day exploring Parramatta's fascinating past awaits on Saturday 2 November! From horse cart rides, heritage tours to live music, a petting zoo and traditional trade demos, there's something for everyone on Foundation Day from 9am to 2pm at the Parramatta North cultural precinct.

Plus Making It Australia winner, George Buchanan will be hosting a hands-on hobby horse making competition and race for everyone to enjoy.

Scan the QR code for more information.

HAVE YOUR SAY IN PARRAMATTA'S RIVER FORESHORE MAKEOVER

We want your input Parramatta! The Eastern Parramatta River project is set to transform our river foreshore into a vibrant, pedestrian and cyclist-friendly haven.

With $9 million in upgrades planned across Parramatta, Rydalmere and Ermington, this is your chance to share your thoughts on the designs.

Scan the QR code by 5pm on Thursday 21 November or visit **participate.cityofparramatta.nsw.gov.au/eastern-parramatta-river**

REDUCE TEXTILE WASTE AT OUR CLOTHES SWAP

Join us at our Clothes Swap on Saturday 9 November from 10am to 1pm to revamp your wardrobe sustainably!

Bring five pre-loved and gentle used clothing and accessories of all sizes and genders and swap them for new-to-you treasures at Parramatta Library. You'll receive five tokens to trade for new finds and no cash is needed!

For T&C's and to register, scan the QR code.

City of Parramatta 126 Church Street, Parramatta NSW 2150
PO Box 32, Parramatta NSW 2124 | P 9806 5050 E council@cityofparramatta.nsw.gov.au
@cityofparramatta > @atparramatta @parracity > @atparramatta @cityofparramatta > @atparramatta

SCAN ME FOR COUNCIL MEETING DETAILS

Lord Mayor's Column, 29 October 2024.

6. Appendix B

Social media reporting, Facebook, Instagram and comments

Reporting on Eastern Parramatta River campaign – Facebook and Instagram

1 City of Parramatta INSTAGRAM /cityofparramatta | Thursday Nov 14, 2024 10:40

This project will provide our community with more opportunities to enjoy the natural beauty of the Parramatta River at five foreshore parks. Have you had your say on the Eastern Parramatta River project?

INSIGHTS

1 Replies	220 Exits	703 Taps forward	14 Taps back
17.15% Completion rate	1.1k Reach	1.1k Impressions	0.09% Reach eng. rate
0.09% Impressions eng. rate			

Eastern Parramat

2 City of Parramatta FACEBOOK /cityofparramatta | Thursday Nov 14, 2024 09:00

Have you had your say on the Eastern Parramatta River project?

With 2.8km of pedestrian and cyclist path improvements, new LED lighting and landscaping projects, many requested by our community, the Eastern Parramatta River project will provide our community with more opportunities to enjoy the

... Show more

9 Interactions	8 Reactions	0 Comments	1 Shares
0.2 Int. per 1K fans	2k Impressions		

INSIGHTS

1.9k Reach	0 Paid reach	1.9k Organic reach	34 Engagements
1.84% Reach eng. rate	2k Impressions	0 Paid impressions	2k Organic impressions
1.73% Impressions eng. rate	N/A Engaged users	23 Post clicks	

Eastern Parramat

3

City of Parramatta
INSTAGRAM /cityofparramatta

Thursday Nov 14, 2024 09:00

NO SENTIMENT

Have you had your say on the Eastern Parramatta River project?

With 2.8km of pedestrian and cyclist path improvements, new LED lighting and landscaping projects, many requested by our community, the Eastern Parramatta River project will provide our community with more opportunities to enjoy the

... Show more

ORGANIC

30	28	2	1.72
Interactions	Likes	Comments	Int. per 1K followers

INSIGHTS

0	1.8k	30	2.1k
Saves	Reach	Engagements	Impressions
1.66%	1.44%		
Reach eng. rate	Impressions eng. rate		

Eastern Parramat

4

City of Parramatta
INSTAGRAM /cityofparramatta

Wednesday Oct 30, 2024 14:01

Short on time but want to have your say on our park upgrades? Visit our Eastern Parramatta River interactive map for information on improvements to our parks.

See the proposed upgrades, drop a pin and post a comment. We'd love to hear your feedback!

... Show more

ORGANIC

24	24	0	1.39
Interactions	Likes	Comments	Int. per 1K followers

INSIGHTS

1	N/A	909	25
Saves	Video views	Reach	Engagements
1k	2.75%	2.38%	
Impressions	Reach eng. rate	Impressions eng. rate	

Eastern Parramat

5 | City of Parramatta | FACEBOOK /cityofparramatta | Wednesday Oct 30, 2024 14:01

Short on time but want to have your say on our park upgrades? Visit our Eastern Parramatta River interactive map for information on improvements to our parks.

See the proposed upgrades, drop a pin and post a comment. We'd love to hear your feedback!

... Show more

12 Interactions	**12** Reactions	**0** Comments	**0** Shares
0.26 Int. per 1K fans	**1.9k** Impressions		

INSIGHTS

1.8k Reach	**0** Paid reach	**1.8k** Organic reach	**43** Engagements
2.4% Reach eng. rate	**1.9k** Impressions	**0** Paid impressions	**1.9k** Organic impressions
2.25% Impressions eng. rate	**N/A** Engaged users	**31** Post clicks	

Eastern Parramat

6 | City of Parramatta | INSTAGRAM /cityofparramatta | Monday Oct 21, 2024 11:00

NO SENTIMENT

The Eastern Parramatta River Project will deliver a number of foreshore improvements that have been requested by our community. Upgrading 2.8km of pedestrian and cyclist paths, installing LED lighting and new landscaping projects will provide our community with more opportunities to enjoy the natural beauty of the Parramatta River.

... Show more

ORGANIC

24 Interactions	**23** Likes	**1** Comments	**1.41** Int. per 1K followers

INSIGHTS

0 Saves	**1.2k** Reach	**33** Engagements	**1.2k** Impressions
2.84% Reach eng. rate	**2.72%** Impressions eng. rate		

Eastern Parramat

7

City of Parramatta
FACEBOOK /cityofparramatta

Monday Oct 21, 2024 11:00

NO SENTIMENT

The Eastern Parramatta River Project will deliver a number of foreshore improvements that have been requested by our community. Upgrading 2.8km of pedestrian and cyclist paths, installing LED lighting and new landscaping projects will provide our community with more opportunities to enjoy the natural beauty of the Parramatta River.

... Show more

26 Interactions	**23** Reactions	**1** Comments	**2** Shares
0.57 Int. per 1K fans	**3.2k** Impressions		

INSIGHTS

3.1k Reach	**0** Paid reach	**3.1k** Organic reach	**150** Engagements
4.86% Reach eng. rate	**3.2k** Impressions	**0** Paid impressions	**3.2k** Organic impressions
4.7% Impressions eng. rate	**N/A** Engaged users	**109** Post clicks	

Eastern Parramat

Reporting on Facebook and Instagram paid campaigns

1 | INACTIVE | VARIATIONS

CoP_100028-7950-63196_EasternParramattaRiver_AdSet_LGA_Ad2 — Link clicks

The Eastern Parramatta River Project will deliver a number of foreshore improvements that have been requested by our community. Upgrading 2.8km of pedestrian and cyclist paths, installing LED lighting and new landscaping projects will provide our community with more opportunities to enjoy the natural beauty of the Parramatta River. There are planned improvements for five foreshore parks:

1. Rangihou Reserve, Parramatta
2. Baludarri Wetlands, Parramatta
3. Reid Park, Rydalmere
4. Royal Shores, Ermington
5. George Kendall Riverside Park, Ermington.

Learn more about this project, view the concept designs, and have your say before 5pm Thursday 21 November.

https://participate.cityofparramatta.nsw.g...
Eastern Parramatta River Project
Learn more

16 286 Impressions	**$132.43** Spend	**2** Post shares	**47** Post reactions	**5** Post comments
1528 Clicks	**54** Interaction count	**N/A** Video plays	**N/A** Video views	**9.38%** CTR
$0.09 CPC	**$8.13** CPM	**10 565** Reach	**N/A** Lead	**3** Landing page views
275 Link clicks	**330** Post engagement	**2.03%** Post engagement rate	**$0.4** Cost per post engagement	

2 | INACTIVE | VARIATIONS

CoP_100028-7950-63196_EasternParramattaRiver_AdSet_LGA_Ad3 — Link clicks

Based on a vision of providing more public access to the Parramatta foreshore and offering a picturesque riverside journey connecting many CBD visitor destinations, the Eastern Parramatta River project is set to deliver 2.8km of improved pedestrian and cyclist paths alongside new lighting and landscaping.

Upgrades to paths and amenities will be provided at five key locations:

1. Rangihou Reserve, Parramatta.
2. Baludarri Wetlands, Parramatta
3. Reid Park, Rydalmere
4. Royal Shores, Ermington
5. George Kendall Riverside Park, Ermington.

The project will accommodate more visitors along the foreshore and improve safety. Learn more about the Eastern Parramatta River project, and have your say before 5pm Thursday 21 November.

https://participate.cityofparramatta.nsw.g...
Have your say on upgrades to five foreshore parks
Learn more

12 780 Impressions	**$118.22** Spend	**N/A** Post shares	**31** Post reactions	**N/A** Post comments
1076 Clicks	**31** Interaction count	**N/A** Video plays	**N/A** Video views	**8.42%** CTR
$0.11 CPC	**$9.25** CPM	**9 261** Reach	**N/A** Lead	**3** Landing page views
199 Link clicks	**231** Post engagement	**1.81%** Post engagement rate	**$0.51** Cost per post engagement	

3 | 2 | 3 INACTIVE VARIATIONS

CoP_100028-7950-63196_EasternParramattaRiver_AdSet_SuburbSpecific_Ad4 Link clicks

您对 Eastern Parramatta River 河滨设施升级项目有什么看法？响应广大社区居民要求，该项目将改造2.8公里的人行道和自行车道，装设新的LED照明和美化景观，方便居民和游客尽情享受 Parramatta River 的自然美景。我们将改造五个河滨公园。

详细了解这个项目，并在11月21日星期四下午5:00前发表您的意见。

https://participate.cityofparramatta.nsw.g...
Submissions closing soon Learn more

8 214 Impressions	**$126.54** Spend	**4** Post shares	**21** Post reactions	**3** Post comments
832 Clicks	**28** Interaction count	**N/A** Video plays	**N/A** Video views	**10.13%** CTR
$0.15 CPC	**$15.41** CPM	**5 077** Reach	**N/A** Lead	**3** Landing page views
226 Link clicks	**256** Post engagement	**3.12%** Post engagement rate	**$0.49** Cost per post engagement	

4 | 2 | 3 INACTIVE VARIATIONS

CoP_100028-7950-63196_EasternParramattaRiver_AdSet_LGA_Ad1 Link clicks

Have your say on new foreshore upgrades!

The Eastern Parramatta River project brings together a program of pedestrian and cyclist amenity and safety improvements in five key locations:
1. Rangihou Reserve, Parramatta
2. Baludarri Wetlands, Parramatta
3. Reid Park, Rydalmere
4. Royal Shores, Ermington
5. George Kendall Riverside Park, Ermington.

Many of the proposed upgrades were requested by our community. View the concept designs and have your say before 5pm, Thursday 21 November.

https://participate.cityofparramatta.nsw.g...
Have Your Say Learn more

7 319 Impressions	**$72.02** Spend	**1** Post shares	**11** Post reactions	**N/A** Post comments
651 Clicks	**12** Interaction count	**N/A** Video plays	**N/A** Video views	**8.9%** CTR
$0.11 CPC	**$9.84** CPM	**4 852** Reach	**N/A** Lead	**2** Landing page views
138 Link clicks	**150** Post engagement	**2.05%** Post engagement rate	**$0.48** Cost per post engagement	

5 | INACTIVE | VARIATIONS

CoP_100028-7950-63196_EasternParramattaRiver_AdSet_LGA_Ad4 — Link clicks

您对 Eastern Parramatta River 河滨设施升级项目有什么看法？响应广大社区居民要求，该项目将改造2.8公里的人行道和自行车道，装设新的LED照明和美化景观，方便居民和游客尽情享受 Parramatta River 的自然美景。我们将改造五个河滨公园。

详细了解这个项目，并在11月21日星期四下午5:00前发表您的意见。

https://participate.cityofparramatta.nsw.g...
Submissions closing soon
Learn more

2 453 Impressions	$26.69 Spend	1 Post shares	7 Post reactions	N/A Post comments
190 Clicks	8 Interaction count	N/A Video plays	N/A Video views	7.75% CTR
$0.14 CPC	$10.88 CPM	1 990 Reach	N/A Lead	N/A Landing page views
42 Link clicks	50 Post engagement	2.04% Post engagement rate	$0.53 Cost per post engagement	

6 | INACTIVE | VARIATIONS

CoP_100028-7950-63196_EasternParramattaRiver_AdSet_SuburbSpecific_Ad1 — Link clicks

Have your say on new foreshore upgrades!

The Eastern Parramatta River project brings together a program of pedestrian and cyclist amenity and safety improvements in five key locations:
1. Rangihou Reserve, Parramatta
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Many of the proposed upgrades were requested by our community. View the concept designs and have your say before 5pm, Thursday 21 November.

https://participate.cityofparramatta.nsw.g...
Have Your Say
Have your say on new foreshore upgrades!
Learn more

990 Impressions	$21.44 Spend	N/A Post shares	N/A Post reactions	N/A Post comments
78 Clicks	0 Interaction count	N/A Video plays	N/A Video views	7.88% CTR
$0.28 CPC	$21.66 CPM	779 Reach	N/A Lead	N/A Landing page views
27 Link clicks	27 Post engagement	2.73% Post engagement rate	$0.79 Cost per post engagement	

7 | 2 3 INACTIVE VARIATIONS

CoP_100028-7950-63196_EasternParramattaRiver_AdSet_SuburbSpecific_Ad3 Link clicks

Based on a vision of providing more public access to the Parramatta foreshore and offering a picturesque riverside journey connecting many CBD visitor destinations, the Eastern Parramatta River project is set to deliver 2.8km of improved pedestrian and cyclist paths alongside new lighting and landscaping.

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The project will accommodate more visitors along the foreshore and improve safety. Learn more about the Eastern Parramatta River project, and have your say before 5pm Thursday 21 November.

https://participate.cityofparramatta.nsw.g...
Have your say on upgrades to five foreshore parks
Learn more

184 Impressions	**$0** Spend	**N/A** Post shares	**N/A** Post reactions	**N/A** Post comments
3 Clicks	**N/A** Interaction count	**N/A** Video plays	**N/A** Video views	**1.63%** CTR
$0 CPC	**$0** CPM	**171** Reach	**N/A** Lead	**N/A** Landing page views
N/A Link clicks	**N/A** Post engagement	**N/A** Post engagement rate	**$0** Cost per post engagement	

8 | 2 3 INACTIVE VARIATIONS

CoP_100028-7950-63196_EasternParramattaRiver_AdSet_SuburbSpecific_Ad2 Link clicks

The Eastern Parramatta River Project will deliver a number of foreshore improvements that have been requested by our community. Upgrading 2.8km of pedestrian and cyclist paths, installing LED lighting and new landscaping projects will provide our community with more opportunities to enjoy the natural beauty of the Parramatta River. There are planned improvements for five foreshore parks:

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5. George Kendall Riverside Park, Ermington.

Learn more about this project, view the concept designs, and have your say before 5pm Thursday 21 November.

https://participate.cityofparramatta.nsw.g...
Eastern Parramatta River Project
Learn more

127 Impressions	**$0.9** Spend	**N/A** Post shares	**1** Post reactions	**1** Post comments
12 Clicks	**2** Interaction count	**N/A** Video plays	**N/A** Video views	**9.45%** CTR
$0.08 CPC	**$7.09** CPM	**110** Reach	**N/A** Lead	**1** Landing page views
1 Link clicks	**3** Post engagement	**2.36%** Post engagement rate	**$0.3** Cost per post engagement	

City of Parramatta

The Eastern Parramatta River Project will deliver a number of foreshore improvements that have been requested by our community. Upgrading 2.8km of pedestrian and cyclist paths, installing LED lighting and new landscaping projects will provide our community with more opportunities to enjoy the natural beauty of the Parramatta River. There are planned improvements for five foreshore parks: 1. Rangihou Reserve, Parramatta 2. Baludarri Wetlands, Parramatta 3. Reid Park, Rydalmere 4. Royal Shores, Ermington 5. George Kendall Riverside Park, Ermington. Learn more about this project, view the concept designs, and have your say before 5pm Thursday 21 November at https://bit.ly/40alxf9

CycleSydney
11:06:18 PM 21 Oct 2024 Created

These are on the Greater Sydney Bike Trail

City of Parramatta
3h ·

Short on time but want to have your say on our park upgrades? Visit our Eastern Parramatta River interactive map for information on improvements to our parks.

See the proposed upgrades, drop a pin and post a comment. We'd love to hear your feedback!

The Eastern Parramatta River project is proposing improvements in five key locations along the river:

1. Rangihou Reserve, Parramatta
2. Baludarri Wetlands, Parramatta
3. Reid Park, Rydalmere
4. Royal Shores, Ermington
5. George Kendall Riverside Park, Ermington

📍 Find our interactive map at https://bit.ly/4fpqi96

🌱 Learn more about this project at https://bit.ly/40alxf9

Community social media comments

PARTICIPATE.CITYOFPARRAMATTA.NSW.GOV.AU (view link)

Comments

Antony Dj-esky Zbik
3:44:06 PM 22 Oct 2024 Created

More disability accessible skate parks please, there aren't enough skate parks that I can take my mobility scooter on.

City of Parramatta
9:09:31 AM 23 Oct 2024 Created

Appreciate you taking the time to comment, Antony. Be sure to follow the links through to Participate Parramatta and submit your feedback directly

Dre Nov
9:05:32 AM 25 Oct 2024 Created

Education for dog owners. Too much dog poops everywhere along the path near the apartments. Signs in different languages.

Leonora Caguin
8:04:59 AM 31 Oct 2024 Created

Education for picnickers to take their rubbish with them and not to leave without cleaning the tables and benches they've used. No matter how beautiful the park is if people using them are not mindful then it becomes useless.

Morgan Tyler James
8:27:42 AM 04 Nov 2024 Hidden

Leonora Caguin blame the indians...they treat the place like they would back in thier country

Travis Bickle
12:25:13 AM 22 Oct 2024 Created

How about fixing the walking track around parramatta river

City of Parramatta
1:42:02 PM 29 Oct 2024 Created

Hi Travis, could you please let us know which walking track/which section of the Parramatta River you're asking about?

Travis Bickle
11:39:23 PM 30 Oct 2024 Created

City of Parramatta the lake

City of Parramatta
11:43:25 AM 31 Oct 2024 Created

Hi Travis, Thanks for your interest in Lake Parramatta. With its $1.4 million make-over it is going to be even more appealing to locals for walking and swimming. We've been doing some maintenance work on the tracks, and in conjunction with NSW Fire and Rescue also undertook some hazard reduction works last year. The track is in good condition with improved wayfinding that was installed a few years ago. There are no additional upgrades planned except for general ongoing maintenance. Council has a Lake Parramatta Masterplan due to be renewed next year. However, this will focus on the recreational /visitor precinct and on the natural areas surrounding the lake. The community has also requested improvements to the parking area, and we'll be investigating what upgrades can be delivered given the constraints of the site. Action items from the Masterplan will also rely on securing funding from the NSW Government.

John North
8:58:46 PM 29 Oct 2024 Created

Thank you for investing in these great improvements for us!

Pat Phillips
6:04:53 PM 30 Oct 2024 Created

Please provide more car spaces for parking - never enough for picnickers and families

Sn Stefanov
6:39:50 PM 02 Nov 2024 Created

Please BAN the electric bicycles, they are so dangerous.

Mick Leahy
7:39:00 PM 02 Nov 2024 Created

Sn Stefanov alright Mr fun police □

City of Parramatta

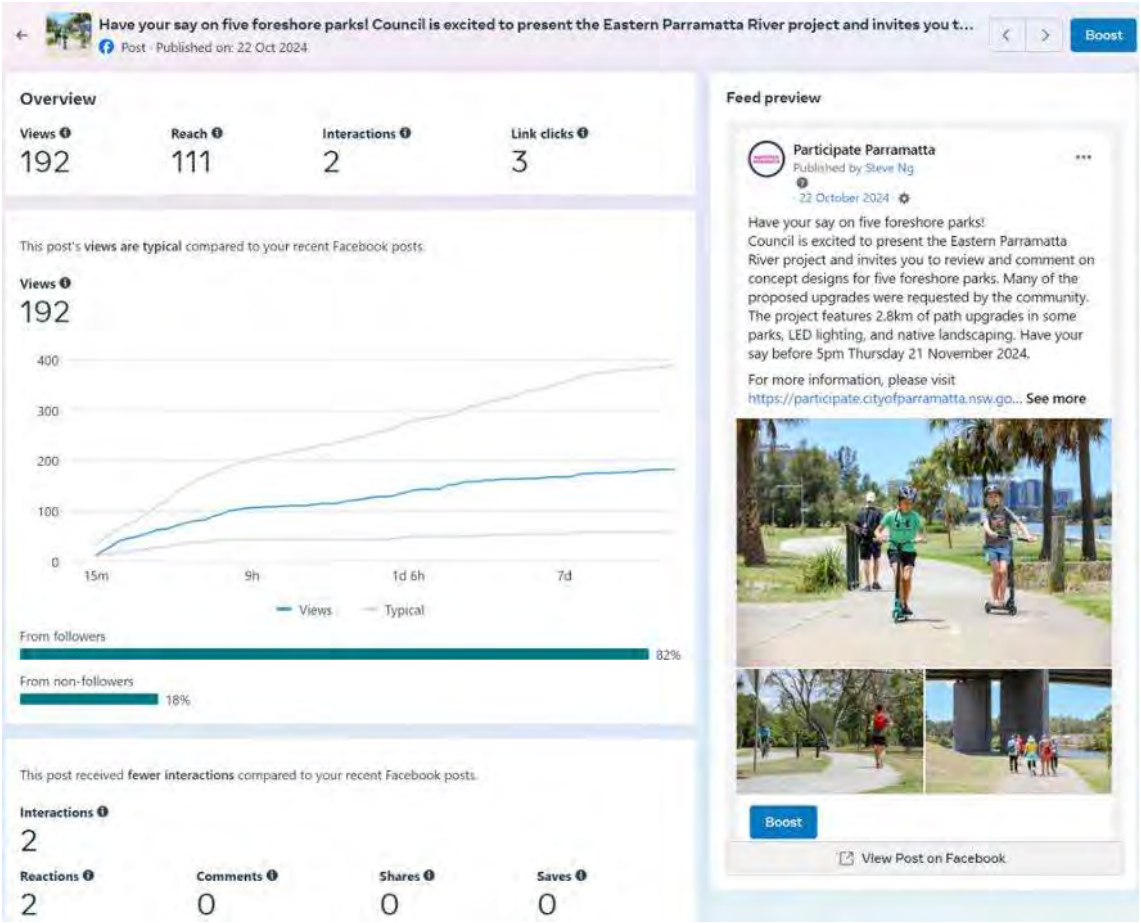
Have you had your say on the Eastern Parramatta River project? With 2.8km of pedestrian and cyclist path improvements, new LED lighting and landscaping projects, many requested by our community, the Eastern Parramatta River project will provide our community with more opportunities to enjoy the natural beauty of the Parramatta River. There are planned improvements for five foreshore parks. Learn more about this project, and have your say before 5pm Thursday 21 November at the link in our bio □

Kirrily Yates
9:06:47 AM 15 Nov 2024 Edited

Is there any way of getting someone out of the river if they fall in? I asked a few different workers during the recent cleaning near the ferry but it seemed to only concern me.

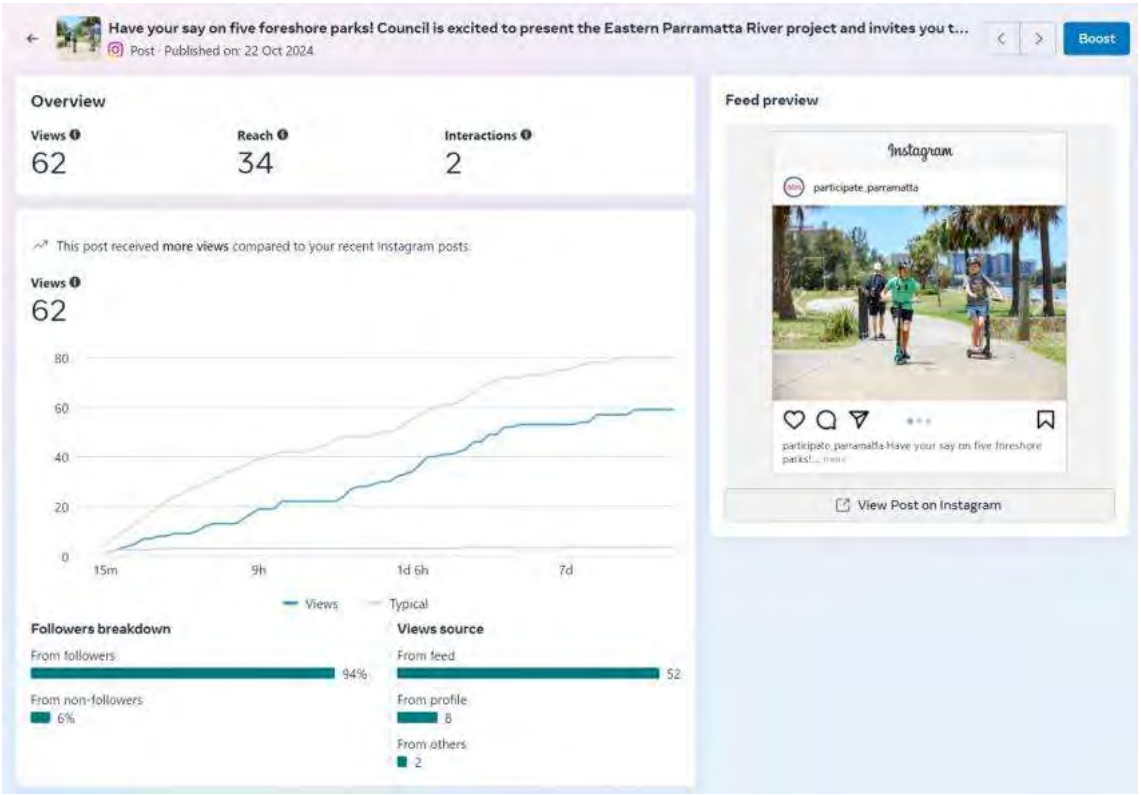
Participate Parramatta Facebook and Instagram reporting

Participate Parramatta Facebook



Participate Parramatta has 6,900 Facebook followers. The post reached 111 people (192 views) creating seven (7) engagements and three (3) three link clicks.

Participate Parramatta Instagram



The Participate Parramatta Instagram has 620 following. The post reached 34 people (62 views) creating seven (7) engagements.

Active Parramatta Facebook

An organic post (non-paid) was shared on the Council's Active Parramatta Facebook page (4.6K followers). The post reached 657 people, creating eight (8) engagements, 1 like, 1 comment, and six (6) link-clicks.

ENVIRONMENTAL MANAGEMENT PLAN

June 2014

PARRAMATTA CITY COUNCIL

Environmental Management Plan, George Kendall Riverside Park

Submitted to:
Andrew Scholz
Parramatta City Council
Project Officer - Environmental Outcomes

Proposal Number. 147623007-001-R-Rev0

Distribution:

Parramatta City Council - 1 Copy
Golder Associates - 1 Copy

Golder Associates

Record of Issue

Company	Client Contact	Version	Date Issued	Method of Delivery
Parramatta City Council	Andrew Scholz	147623007-001-R-Rev A	06 May 2014	Electronic as Pdf
Parramatta City Council	Andrew Scholz	147623007-001-R-Rev 0	27 June 2014	Electronic as Pdf

Table of Contents

TABLES

APPENDICES

Glossary

mAHD	Metres Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
As	Arsenic
B(a)P	Benzo(a)pyrene
BGL	Below ground level
BTEX	Benzene, toluene, ethyl benzene, xylene
Cd	Cadmium
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
CoC	Chain of custody
Cr	Chromium
Cu	Copper
DBYD	Dial before you dig
DO	Dissolved oxygen
DP	Deposited plan
DSI	Detailed Site investigation
DQO	Data quality objective
EC	Electrical conductivity
EPA	Environment Protection Authority
FID	Flame ionisation detector
Ha	Hectares
Hg	Mercury
HIL	NEPM health investigation Levels
Golder	Golder Associates Pty Ltd
GW	Groundwater
H_2S	Hydrogen sulfide
<1, <100	Less than the PQL, that is, less than 1 or 100 units
LCS	Laboratory control spike
LFG	Landfill Gas
LOR	Limit of reporting (of chemical concentrations)
m	Metre
MB	Laboratory Method Blank
mbgl	Metres below ground level
mg/kg	Milligrams per kilogram (or ppm)
mg/L	Milligrams per Litre (or ppm)
mm	millimetre
Mn	Manganese
MS	Matrix Spike
Ni	Nickel
OEH	Office of Environment and Heritage
OCP	Organochlorine pesticides

PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCC	Parramatta City Council
PID	Photoionisation detector
ppm	Parts per million
ppmv	Parts per million by volume
PQL	Practical quantitation limit (of chemical concentration)
RPD	Relative percent difference
SAQP	Sampling Analysis Quality Plan
SOP	Standard operating procedures
SSSEP	Site Specific Safety and Environmental Plan
SVW	Soil vapour well
SW	Surface water
SWMS	Safe Work Method Statement
TPH	Total Petroleum hydrocarbons
TRH	Total Reportable hydrocarbons
µg/L	Micrograms per litre (or part per billion)
VOCs	Volatile organic compound
Zn	Zinc

1.0 INTRODUCTION

1.1 General

This Environmental Management Plan (EMP) has been prepared by Golder Associates Pty Ltd (Golder) on behalf of Parramatta City Council (PCC) for the George Kendall Riverside Park located at 38, 38A and 38B Spofforth Street, Ermington, New South Wales (NSW) (herein referred to as the "site" and shown in Figure 1, attached). The EMP has been prepared in general accordance with Golders' proposal (Reference: P47623007-001-P-Rev0) dated 3 February 2014.

1.2 Objectives

The objectives of the EMP are to describe management and control measures which mitigate the potential public health and environmental risks the former landfill poses to receptors and the environment. The recommended control measures take into account site specific conditions and are designed to permit the ongoing use of the site as public open space.

1.3 Scope

The scope of work completed for the development of the EMP included the review existing Council records and existing documents; and preparation of a site specific EMP (this document) in general accordance with relevant guidelines.

The EMP has been developed using the information presented the "*George Kendall Riverside Park, Environmental Site Assessment,"* June 2013 (ref. no. 127623030-004-R-Rev0) and the letter report *"Additional soil and groundwater sampling, George Kendall Reserve – Draft Report," 28 April 2014 (ref no. 147623020-002-L-RevA)* prepared by Golder on behalf of PCC.

2.0 BACKGROUND

2.1 Site Identification

The site is currently known as George Kendall Riverside Park, and comprises approximately 18 ha of open space parkland fronting onto the Parramatta River (refer to Figure 1, Appendix A). It is bounded by:

- Broadoaks Street to the west, with residential properties beyond;
- The Parramatta River to the south and east; and
- Residential properties to the north.

The site is legally identified as:

- 38 Spofforth Street consisting of Lot A DP 400277 and Lots 670-671, 675-676, 683-684,694, 703-711, 714-718, 723-724, 729-732, 739, 753-755 DP 16184;
- 38A Spofforth Street consisting of Lot 928 DP 752028 and Lot 7313 DP 1157169;
- 38B Spofforth Street consisting of Lots 665-669, 672-674, 677-682, 685-686, 695-702, 719-722, 735-738, 740-748, 749-751, 712-713, 725-728, 733-734 DP 16184; and
- Those sections of Spofforth Street, Trumper Street and Atkins Road enclosed within the park boundary.

2.2 Site History and Previous Investigations

The following summary of the site history has been developed from historical documents supplied by PCC, the review of previous environmental investigations and the review of historical aerial photographs and interviews with long serving PCC staff that have knowledge on the history of the site. Pertinent aspects of the history of the site include the following:

- Approval was provided for the use of the site as a sanitary depot by the Minister for Health in 1970 and included a number of requirements for operation including:
  - No burning of waste;
  - No liquid wastes or sludges to be disposed;
  - An impervious seawall was to be built at the mean high water mark and in areas within the landfill below the mean high water mark and consolidated with hard fill prior to placement of rubbish (i.e. base liner); and
- During the early 1980's the Health Commission of NSW proposed to declare the entire site as unhealthy building land, however PCC disagreed noting that portions of the site were not filled and likely suitable for use. To support their case PCC completed a landfill gas investigation across the site and a boundary was established on the basis of the gas survey where acceptable levels would allow for suitable building. Everything south of the boundary was considered to be unhealthy building land, with land uses limited to passive recreation or car parking. The boundary included a 10 m buffer zone between the proposed development area and the closest unacceptable methane concentrations. On this basis in 1982, the area encompassed by the red line in Figure A was established as unhealthy building land.

Figure A: Area declared as unhealthy building land (3/12/1982)

- An environmental investigation was performed by SKM in 1995 that included assessment of landfill gas and capping layer thickness. The results indicated that the capping layer ranged in thickness from approximately 0.3 to 1.2 m, with large areas reported to have a capping thickness less than 0.4 m. Soil gas readings identified isolated areas where methane gas was detected. The report reviewed by Golder (2013) did not include all the available information, however of note was a figure indicating two areas of the site where the methane measurement exceeded 70% of the lower explosive limit (LEL);
- SKM installed four groundwater monitoring wells along the southern boundary between the landfill and the Parramatta River in September 1995. Groundwater was sampled and analysed and the following results were reported:
  - Ammonia exceeded the then current criteria (0.5 mg/L) by a large amount at all locations;
  - Sulfate exceeded criteria (250 mg/L) by a factor of five at all locations;
  - Chloride exceeded criteria (250 mg/L) at three locations (BH3, BH4 and BH5); and
  - Adsorbable organohalogens (AOX) results were compared to a database of results from similar landfills, which indicated a “typical” AOX concentration of 400 µg/L. This value was exceeded at two locations.
- PCC performed two rounds of surface water sampling in February 2011 (dry weather) and April 2011 (wet weather). Of note are the reported ammonia concentrations for the suspected leachate monitoring points from the outlet pipes which were reported as ranging between 3 mg/L and 4.3 mg/L, exceeding the ANZECC trigger value of 1.99 mg/L.

- A review of historical aerial photographs was undertaken an estimate of the extent of waste disposal at the site based on the aerial photographs and results of the Golder (2013) site investigation is presented in Figure 2. The aerial photographs indicate that landfilling most likely ceased between 1975 and 1977.

2.3 Potential Contaminants of Concern

Based on the historic use of the site as a landfill, the following potential contaminants of concern for the site are identified in Table 1 below:

Table 1: Summary of Potential Contaminants of Concern

Matrix	Contaminants of Concern
Soil	■ Metals [arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni) and zinc (Zn)]; ■ Total recoverable hydrocarbons (TRH); ■ Benzene, toluene, ethylbenzene and xylene (BTEX); ■ Polycyclic aromatic hydrocarbons (PAH); ■ Organochlorine pesticides (OCP); ■ Polychlorinated biphenyls (PCB); ■ Organophosphate pesticides (OPPs); and ■ Asbestos.
Landfill Gas	■ Methane (CH_4); ■ Carbon dioxide (CO_2); ■ Hydrogen sulfide (H_2S); and ■ Carbon monoxide (CO).
Surface Water and Groundwater	■ Ammonia; ■ Nitrite and nitrate; ■ Total iron; ■ Total phenols; ■ Dissolved organic carbon; ■ PAHs; ■ TRH; ■ Volatile organic compounds (VOCs) including BTEX; and ■ Metals and metalloids [As, Cd, Cr, Cu, Pb, Hg, Ni, and Zn].

2.4 Site Features and Setting

The park predominantly consists of grassed open space and includes a number of public amenities. These are identified on Figure 2 (Appendix A) and are summarised as follows:

- A public foot/bike path is located along the southern and eastern boundaries of the Site;
- An off-leash dog walking area is located in the north-eastern corner of the park;
- The western portion of the park consists largely of sporting facilities including baseball fields (south-west) and soccer and cricket fields (north-west); and
- Barbeque and eating facilities, tennis courts, a club house and a children's playground are located to the north of the of the soccer fields.

Underground service utilities presented within the site include:

- A large covered stormwater drain that runs north-south from Boyle Street to the Parramatta River. A number of access points are available along the alignment, including two access points within the landfill footprint and two to the north of the landfill; and
- Water and electrical lines servicing the site amenities.

2.5 Site Condition and Surrounding Environment

Golder understands that PCC has undertaken several stages of remedial capping works across various areas of the site during the late 1990's. Landfill capping within the central portion of the site (i.e. area adjacent to the stormwater drain) is expected to be finished at some point in the near future as part of the development of further sporting fields. The ground surface is now predominantly covered with grass and trees, with minor sealed areas, structures and amenities also present. Mangroves form the southern and eastern boundaries of the site along the foreshore of the Parramatta River. Residential properties are located along the northern and western boundaries.

2.5.1 Topography and Surface Water

The natural topography of the site consists of gently sloping land from the north to south towards the Parramatta River. In contrast, the capping of areas of historical landfilling has resulted in landforms that are predominantly flat with steep batters adjacent to the river. It is estimated that the waste is thickest within the southern portion of the site closet to the Parramatta River and shallower along the northern boundary.

Surface drainage from the landfill is observed to flow towards the central portion of the landfill adjacent to the alignment of the existing stormwater drain which traverses north to south directly through the landfill. Water exits at a low point located at the central southern portion of the site. Some areas of the landfill also tend to become saturated due to poor surface drainage. These areas are largely located at the northern end of the baseball fields adjacent to the dugouts/shelters.

2.5.2 Geology and Hydrogeology

According to the *1:100,000 Geological Series Sheet 9130, Sydney (Ed. 1)* (NSW Department of Mineral Resources 1983), the site is underlain by the sandstone formations of the Triassic Hawkesbury Sandstone Formation. The southern area of the site, on the foreshore of the Parramatta River, is indicated as being overlain by Quaternary silty to peaty quartz sand, silt and clays.

At a regional scale, groundwater flow within the Hawkesbury Sandstone is typically associated with sheet sandstone facies, which are generally characterised by coarse sand grains with large intergranular pore spaces. Groundwater flow is associated both with primary porosity in the sheet sandstone strata, which accounts for the bulk to the groundwater storage capacity, and secondary porosity associated with block joints, faults and bedding plane fractures, which largely control the transmissivity of the aquifer, in addition to providing a mechanism for rapid infiltration of surface water recharge and vertical connectivity between discrete aquifer zones.

Where it outcrops, the Hawkesbury Sandstone is known to weather to friable sandstone, which can form a perched shallow groundwater system that behaves as an unconsolidated, unconfined “water table” aquifer. The thickness of the weathered zone varies depending largely on the local topography and surface water drainage. The upper weathered zone of the Hawkesbury Sandstone can store and transmit perched groundwater, and can facilitate deep drainage of infiltrating water through connections with deeper strata via defects in the rock mass (joints, fractures, etc).

The direction of shallow groundwater flow is assumed to be in southerly direction towards the Parramatta River, consistent with the original topography of the land. This was generally supported by the measured water levels in the shallow groundwater monitoring network installed by Golder (2013).

3.0 PRELIMINARY CONCEPTUAL SITE MODEL

On the basis of the Environmental Site Assessment (ESA) (Golder 2013) and the supplementary investigation (Golder 2014), a preliminary conceptual site model (CSM) was developed that describes the potential contamination sources, pathways for contaminant migration and exposure, and receptors for contamination. If any of these elements is missing or incomplete, then the exposure pathway is considered to be incomplete and is unlikely to present an unacceptable risk. Where complete exposure pathways are identified (or inferred), further assessment or management may be warranted to mitigate potential risks to human health or the environment.

3.1 Contamination Sources

The following observations are made with respect to contamination sources from the historical landfilling activities:

- **Soil/fill material** – the results of the soil investigation program indicated a relatively low contamination risk from contact with shallow soil, with only one sample (GATP19 (0.05m to 0.15m)) reporting an exceedance of the NEPM assessment criteria for B(a)P of 3 mg/kg (NEPC 2013). The B(a)P concentrations reported in this sample are greater than 2.5 times the assessment criteria, and therefore represent a 'hot spot' in accordance the with NEPM guidelines. The PAH impacts were not detected during the subsequent delineation investigation (Golder, 2014), and were likely buried during the test pitting investigation.

- **Surface water** – analytical results from stormwater and surface seepages indicated the presence of leachate indicator parameters, some of which exceeded the ecological assessment criteria. Hence leachate-impacted surface water represents a potential contamination source.

- **Groundwater** – analytical results from groundwater and leachate wells indicated the presence of leachate indicator parameters and volatile organic compounds (VOCs), some of which exceeded the ecological assessment criteria. Hence leachate-impacted groundwater represents a potential contamination source.

- **Landfill Gas** – The surface and subsurface landfill gas investigation identified methane both in the subsurface, and as fugitive emissions through the landfill cap, some of which exceeded the relevant assessment criteria. Accordingly, landfill gas (specifically methane) is considered to represent a potential contamination source (or more specifically, a potential safety hazard).

3.2 Contaminant Migration Pathways

The following migration pathways are considered to be relevant for the contamination sources identified:

- **Erosion and overland transport of contaminated soil** – Given the generally acceptable contamination status of the shallow soil at the site, and no substantial visual evidence of surface erosion at the park, this is considered to be an unlikely contamination migration pathway.

- **Stormwater discharge** - a large underground stormwater pipe passes through the centre of the site and discharges to the Parramatta River. Analytical results for samples collected from the stormwater drain indicate that leachate is entering the drain, and is subsequently discharging off-site into the Parramatta River. Hence stormwater discharge is considered to be a relevant migration pathway.

- **Seepage and overland flow** – surface seepage of leachate-impacted water was observed in the south-central portion of the Site, which was observed to be flowing to the southern site boundary. Analytical results for the seepage water indicated elevated concentrations of leachate indicator parameters. Hence, seepage and overland flow is considered to be a relevant migration pathway.

- **Groundwater extraction** – given that the site is a former landfill, and is also parkland administered by PCC, it is considered highly unlikely that groundwater extraction would occur within the park. Hence this exposure pathway is considered to be an unrealistic exposure pathway.

- **Groundwater discharge to the Parramatta River** – the Golder ESA (2013) identified leachate and leachate-impacted groundwater (including VOC impacted groundwater) within the site and at the southern and eastern site boundaries. Groundwater was encountered in the shallow soil/fill profile, and potentiometric analysis suggests a south to southwest flow direction (i.e. towards the Parramatta River). The shallow, unconsolidated formation in which the monitoring wells are installed was observed to become very thin, and even absent, in the mangroves at the southern site boundary. Hence the precise nature and extent of the hydraulic connection between the perched groundwater system onsite, the mangroves and ultimately the Parramatta River is unclear. It is also possible that leachate-impacted groundwater is migrating through the underlying Hawkesbury Sandstone; however the scope of the Golder ESA (2013) did not include the investigation of deeper water-bearing strata. The conservative assumption is that off-site discharge of leachate-impacted groundwater is considered a potentially valid migration pathway.

- **Subsurface migration and surface fugitive emissions of landfill gas** – the soil gas investigation identified some elevated subsurface methane concentrations (albeit below the LEL), a few elevated surface emissions, and methane flux rates through the cap that exceed the Victoria and NSW EPA guidelines for landfill cap performance. Supplementary soil gas monitoring around the elevated subsurface methane detection did not identify evidence of subsurface methane migration in the unsaturated zone. Accordingly, methane flux through the cap material is considered to be a likely migration pathway, and subsurface migration is considered to be a limited migration pathway based on the monitoring results.

3.3 Potential Receptors

The following receptors/exposure scenarios were considered to be plausible on the basis of the contamination sources and migration pathways, and nature of the land use on site:

- **The Parramatta River** – It is considered likely that leachate-impacted surface water is discharging to the Parramatta River and it is also possible that leachate-impacted groundwater is discharging to the river. Hence, the Parramatta River is considered to be a receptor for off-site contaminant migration.

- **Park users** – Recreational users of the park have the potential to come into contact with leachate-impacted surface seeps, and potentially with stormwater discharge at the southern end of the site. Hence park users are considered to be valid receptors.

- **Park Maintenance Workers** – Park maintenance workers at the park have the potential to come into leachate-impacted surface seeps, potentially with leachate impacted stormwater within the stormwater drain and stormwater discharge at the southern end of the site. Workers performing excavation works at the site also have the potential to come into contact with impacted waste materials, leachate impacted surface water and leachate. Hence workers are considered to be valid receptors.

- **Groundwater users** – It is considered very unlikely that groundwater would be extracted from within or close proximity to the park given the history of landfilling. Hence, private water supply bores are considered to be unlikely receptors for contamination from the site.

- **Residential properties** – The detection of methane concentrations exceeding the assessment criteria at some locations suggested the possibility for lateral migration of methane onto adjacent properties. If this occurred, then accumulation of methane beneath the surrounding residential properties was considered possible. However, supplementary soil gas monitoring in residential back yards adjacent to the perimeter probes where the methane exceedances were recorded did not identify evidence of methane migration. Hence, residential properties and off-site underground services are considered to be unlikely receptors for subsurface methane migration.

- **Underground Services (Stormwater) Workers** - A comprehensive survey of the presence of methane in the stormwater drain passing through the site could was not completed due to access constraints. However, the stormwater pit located to the north of the waste mass obtained a minor detection for volatiles of 168 ppmv. Sampling of the stormwater confirmed that leachate is entering the drain. Hence

workers entering the stormwater drain or completing excavations within the vicinity of the stormwater drain are considered valid receptors.

3.4 Complete Exposure Pathways

In consideration of the source-pathway-receptor relationships discussed in the previous sections, the following exposure pathways are considered to be valid for the site and are the focus of the management actions developed for the site:

- Dermal contact with leachate-impacted seepage water or stormwater by park users and workers on the site;
- Exposure to fugitive methane emissions by park users and workers on the site;
- Discharge of leachate-impacted seepage water or stormwater to the Parramatta River; and
- Discharge of leachate-impacted groundwater to the Parramatta River.

4.0 REGULATORY FRAMEWORK

This document has been prepared to satisfy PCC's requirements for management of the site in relation to the NSW Environmental Protection Authority (NSW EPA) *Solid Waste Landfill Guidelines* (January 1996) and in accordance with guidelines made or approved by the under Section 105 of the *Contaminated Land Management Act 1997* and / or the *Protection of the Environment Operations Act 1997* listed as follows:

- *Contaminated Sites: Sampling Design Guidelines*, NSW EPA (September 1995);
- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*, NSW EPA (November 1997);
- *Contaminated Sites: Guidelines of the NSW Site Auditor Scheme (2nd Edition)*, NSW Department of Environment and Conservation (NSW DEC) (December 2006);
- *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination*, NSW DEC (March 2007);
- *Contaminated Sites: Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*, NSW Department of Environment and Climate Change (NSW DECC) (June 2009);
- *Waste Classification Guidelines*, NSW DECCW (December, 2009);
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, Australian and New Zealand Environmental Conservation Council (ANZECC) (October 2000); and
- *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, National Environment Protection Council (NEPC) (April 2013).

The environmental goals set out in the *Solid Waste Landfill Guidelines, 1996* (NSW EPA, 1996) outline the issues that are of primary concern to the public and EPA. The EMP has been written to adhere to these guidelines where possible.

Table 2: Solid Waste Landfill Guidelines - Environmental Issues

Section	Issue	Description
6.5, 6.6, 6.15, 6.16	Water Pollution	Preventing pollution of water by leachate Detecting water pollution Remediating water pollution Runoff and Erosion Control Monitoring
6.7	Air Pollution	Preventing landfill gas emissions and related impacts Detecting landfill gas emissions Remediating landfill gas emissions
6.8, 6.9, 6.10, 6.11, 6.12, 6.16	Land Management and Conservation	Remediating landfill prior to change of landuse Managing vegetation on-site to minimise impact to cap and batter
6.13, 6.14, 6.15	Hazard and Loss of Amenity	Preventing unauthorised entry to hazardous areas Preventing degradation of local amenity Preventing air and noise pollution Adequate fire-fighting capacity Adequate staffing and training

It should be noted that the site has never been subject to an Environmental Protection Licence under the *Protection of the Environment Operations Act 1997* and thus regular reporting to NSW EPA is not specifically required for the site. However, depending upon contaminant concentrations and the actual or potential for off-site migration or human exposure to contamination there may be a duty to notify the NSW EPA in accordance with the *Contaminated Sites: Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*.

The NSW EPA (then known as the DECCW) issued the Duty to Report Guidelines in June 2009. These are applicable to land owners or persons responsible for contamination. These guidelines provide information on the duty to report and set out the steps necessary to determine whether to report contamination, taking into account indicators of contamination and the investigation of land, through to triggers for notification. Council would be required to notify NSW EPA of contamination in any of the following circumstances:

- The level of the contaminant in, or on, soil exceeds a level of contamination set out in the Guidelines with respect to a current or approved use of the land, and people have been, or foreseeably will be, exposed to the contamination; or
- The contamination meets criterion prescribed by the regulations; or
- The contaminant has entered, or will foreseeably enter, neighbouring land, the atmosphere, groundwater or surface water, and the contamination exceeds, or will foreseeably exceed a level of contamination set out in the Guidelines and will foreseeably continue to remain above that level.

4.1 Assessment and Monitoring Criteria

4.1.1 Groundwater and Surface Water

The environmental values of surface water and groundwater below the site and in the receiving environment of the Parramatta River were considered in the selection of assessment criteria. The consideration of environmental values is summarised as follows:

- Given that the site is a former landfill, the likelihood of groundwater being used for drinking water purposes is considered highly unlikely. Hence, the health-based criteria of the Australian Drinking Water Guidelines (ADWG, 2011) were not considered to be relevant;
- The environmental values of the Parramatta River, which is considered to be the receiving environment for surface water and groundwater discharge from the site, are considered to be the most relevant. Environmental values of surface water catchments in NSW are defined by water quality objectives (WQOs) for each catchment. A specific set of WQOs have been developed for the Sydney Harbour and the Parramatta River catchments, of which the Upper Estuary WQOs are most relevant to the site. The WQOs are available at the following web link:

  (http://www.environment.nsw.gov.au/ieo/sydneyharbour/report-02.htm#P150_21365).

  These include the protection of:

  - Aquatic ecosystems;
  - Visual amenity;
  - Secondary contact recreation;
  - Primary contact recreation; and
  - Aquatic foods (cooked).

On the basis of the WQOs for the Parramatta River, the relevant assessment criteria for the ESA were considered to be:

- Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (ANZECC, 2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*; and
- The National Health and Medical Research Council (NHMRC, 2008) *Guidelines for Managing Risks in Recreational Water.*

The ANZECC (2000) and NHMRC (2008) criteria are summarised in Table 3, and are discussed in further detail in the following sections.

ANZECC (2000) Assessment Criteria

The ANZECC (2000) guidelines provide trigger values for concentrations of organic and inorganic chemicals in freshwater and marine aquatic environments. The trigger values are generally conservative and contaminant concentrations below the trigger values can be assumed to present a negligible risk to environmental receptors. Where a trigger value is exceeded, it triggers the requirement for more detailed consideration of the potential risks represented by the exceedance. The ANZECC (2000) trigger values were originally developed to assess surface water quality, but they are also applicable to groundwater quality at the point of discharge to a surface water environment.

For the purposes of the EMP, surface water and groundwater analytical results should be assessed relative to the ANZECC (2000) trigger values for 95% level of protection for marine water. The 95% level of protection is intended for use in slightly to moderately disturbed environments, which is considered appropriate with regard to the Parramatta River WQOs.

No guidelines that are considered appropriate for this assessment exist for TPH in groundwater. Low reliability interim indicative working levels (IIWLs) provided in the ANZECC (2000) guidelines refer to a trigger value of 7 µg/L. This is based on US EPA methodology, which is generally not used in deriving guideline values for Australian conditions. More importantly, the values are based on the toxicity to crustaceans from North-West Shelf crude oils. As such, the IIWL for TPH is not an appropriate guideline for assessing the effects of refined petroleum products in an urban environment marine water ecosystem.

Low reliability ANZECC trigger levels are not commonly adopted due to the limitations of their application, hence low reliability criteria have not been widely adopted for the purposes of the EMP. For the analytes for which moderate or high reliability trigger values are not available, or the low reliability trigger values are not considered appropriate, the laboratory limit of reporting (LOR) is adopted as a screening criteria, which is consistent with the *Groundwater Guidelines* (March 2007).

NHMRC (2008) Assessment Criteria

With respect to chemicals in recreational waters, the NHMRC (2008) guidelines state (s 9.3):

> *Mance et al (1984) suggested that environmental quality standards for chemicals in recreational waters should be based on the assumption that recreational water makes only a relatively minor contribution to intake. They assumed a contribution for swimming of an equivalent to 10% of drinking water consumption. Since most authorities (including WHO) assume consumption of 2 litres of drinking water per day, this would result in an intake of 200 mL per day from recreational contact with water (WHO 2003). This provides for a simple screening approach in which a substance occurring in recreational water at a concentration of 10 times that stipulated in the drinking water guidelines may merit further consideration.*

Hence, for the purpose of assessing risks related to primary contact recreation in Parramatta River, the groundwater and surface water data were assessed relative to the health-based ADWG (2011) criteria with a factor of 10x applied to account for the limited ingestion potential relative to the drinking water exposure assumptions. This approach is considered conservative as swimming is indicated as a long-term, aspirational recreational activity in the portion of the Parramatta River to the west of Ryde Bridge, and consequently the exposure route (if any) is likely to be dermal rather than oral.

Table 3: Surface Water and Groundwater Assessment Criteria (µg/L)

Analyte	ANZECC (2000)	NHMRC (2008)
Metals and metalloids		
Arsenic (total)[1]	-	100
Arsenic (V)[1]	4.5	-
Cadmium[7]	0.7	20
Chromium (VI)[2]	4.4	500
Copper	1.3	20,000
Lead	4.4	100
Mercury[7]	0.1	10
Nickel[7]	7	200
Zinc	15	-
Non-metallic inorganics		
Ammonia (as N)[3]	1990	-
Nitrate (as N)	ID	11,295[4]
Total Petroleum Hydrocarbons (TPH)		
TPH (C_6-C_9)	ID	-
TPH (C_{10}-C_{40})	ID	-
Monocyclic Aromatic Hydrocarbons		
Benzene[7]	500	10
Toluene	ID	8,000
Ethylbenzene	ID	3,000
o-xylene	ID	-
m-xylene	ID	-
p-xylene	ID	-
Total xylenes	ID	6,000
Polycyclic Aromatic Hydrocarbons		
Naphthalene[7]	50	-
Benzo[a]pyrene	ID	0.1
Phenols		
Phenol	400	-
Volatile Organic Compounds		
Chlorobenzene	ID	3,000
1,4-dichlorobenzene[5]	60	400
Trichloroethene[6]	ID (30)	-

ID = insufficient data to derive a reliable ecological trigger level.

[1] Arsenic V low reliability trigger value adopted as conservative value.

[2] Chromium VI trigger value adopted as conservative value.

[3] pH-adjusted ammonia (N) trigger value adopted, based on an average pH value of 7.2 for surface water samples from Parramatta River (SW05 to SW09, Golder 2013).

[4] Value converted from nitrate as NO_3 to nitrate as N using a multiplication factor of 0.2259.

[5] Freshwater criteria adopted in absence of marine criteria.

[6] (30) = ANZECC 2000 Chapter 5 – Guidelines for recreational water quality and aesthetics

[7] 99% Protection level adopted as conservative value

4.1.2 Landfill Gas

NSW EPA *Environmental guidelines: Solid waste landfills* (EPA 1996) recommend notification triggers and threshold concentrations for sub-surface gas monitoring and surface gas emission monitoring.

Sub-Surface Landfill Gas

EPA (1996) recommends notification to the EPA if the concentration of methane in subsurface perimeter gas probes exceeds 1.25 percent volume per volume (%v/v) which is equivalent to 25% of the LEL at the perimeter of the site. All gas probes are to be monitored for the presence of the following: CH_4, CO_2, CO, O_2, H_2S and gas flow.

Surface Landfill Gas

EPA (1996) refers to a threshold concentration of 500 parts per million by volume (ppmv) of methane at any point on the landfill surface as a trigger concentration for more detailed investigation and potential management action. Therefore, the trigger level of 500 ppmv has been adopted to assess the performance of the landfill cap with respect to fugitive methane emissions. It should also be noted that if an exceedence is obtained, corrective action is required which may take the form of remediating the area of the “hot spot” followed by confirmation surface screening with an FID. If continued exceedences are obtained, other forms of LFG management should be considered including passive or active LFG gas extraction.

5.0 ENVIRONMENTAL MANAGEMENT MEASURES

Any current or future activities on the site need to consider the risks associated with the exposure to contamination on the site (i.e. dermal contact with leachate-impacted seepage water, exposure to or accumulation of fugitive methane emissions and discharge of leachate-impacted seepage water and /or groundwater). Specific management measures are presented in the following sections, and need to be considered during all future.

Particular attention should be given to any activities which involve physical changes to the site, such as work involving earthworks, landscaping, excavation, stormwater works and construction, as there is a greater potential on the site for exposure to contamination during or in result of these activities. The activities are considered higher risk and specific management measures associated these activities are **highlighted in bold**.

5.1 Water

PCC will implement all practical measures to prevent contaminated waters leaving the site. Based on the current knowledge of the site there are different qualities of waters on the site, including:

- Run-off from undisturbed areas within and upstream of the site – clean stormwater run-off;
- Run-off from rehabilitated (capped and revegetated) areas of the site – clean stormwater run-off;
- Discharge of leachate impacted water from the large underground stormwater pipe passing through the centre of the site – potentially contaminated surface runoff;
- Discharge of leachate impacted water from minor drainage pipelines observed along the sea wall – potentially contaminated surface run-off;
- Seepage of leachate-impacted water observed in the south-central portion of the site – potentially contaminated surface run-off;
- Discharge of leachate impacted groundwater into the adjacent Parramatta River – potentially contaminated groundwater discharge; and
- Leachate contained within the landfill.

Management of water at the site is aimed at minimising the generation of contaminated water, and preventing the deterioration of water quality standards in the adjacent receiving environment (i.e. the Parramatta River). The following sections outline the management of water at the site.

5.1.1 Clean Stormwater Run-off

The implementation of runoff control measures on the site is required to minimise erosion of the cap and batters, reduce sediment loads in surface water runoff and minimise impacts of runoff generated on-site upon off-site receptors (the Parramatta River).

The fundamental controls for the management of clean stormwater are as follows:

- Maintain undisturbed / revegetated areas, an important aspect to be incorporated into runoff control measures is the integration of the vegetation management works specified in Section 5.3;
- Minimise disturbed areas on the site;
- When earthworks and/or areas on the site are disturbed, temporary stormwater management systems are to be used (silt fencing and re-vegetation etc), and are to be compliant with the Landcom 2004, *Soils and Construction Volume 1* (also known as the Blue Book);
- Any concentration of flow over bare and disturbed areas should be avoided;

- All temporary and permanent drainage structures should be designed in accordance with the relevant Australian standards and design criteria for temporary and permanent surface water drainage infrastructure; and
- Maintenance will include:
  - Regular cleaning of drains/pipes/ pits and removal of accumulated sediments;
  - Diversion of flow concentrations from disturbed areas; and
  - Stabilisation of eroded drains.

5.1.2 Potentially Contaminated Run-off

Control measures for the potentially contaminated run-off are required to minimise the potential for park users and workers on the site to be exposed to leachate-impacted seepage water or stormwater and to reduce the discharge of leachate-impacted water into the off-site receptors (the Parramatta River).

The following remediation and / or management actions are recommended to control the risks associated with the potentially contaminated run-off:

- **The existing stormwater drain passing through the site is acting as a direct conduit for landfill leachate migration into the Parramatta River. Specific controls associated with the stormwater pipe include:**
  - **Remediation of the pipe by repairing, replacing or removing the pipe, and/ or lowering the leachate level within the landfill to below the pipe invert such that the volume of leachate entering the stormwater drain is minimised;**
  - **Implementing appropriate health and safety controls to manage the human health risks associated with the leachate entering the stormwater pipe and the potential for methane accumulation to occur within the pipeline; and**
  - **Ensure all above ground structures and/or potential entry points to the stormwater drain are adequately guarded and ensure adequate warning signs identifying the hazards associated with the leachate or stormwater infrastructure are in place.**
- **Minor drainage pipelines observed discharging along the sea wall are currently acting as a direct conduit for off-site leachate migration into the Parramatta River. A comprehensive survey of the entire sea wall and southern boundary should be undertaken to identify any further seepages or presence of additional pipes and each of these pipelines or seeps be decommissioned or sealed.**
- **Leachate seeps were identified in the south-central portion of the site resulting in the potential for park users and workers being directly exposed to leachate or leachate impacted surface water. Specific controls associated with the seeps include:**
  - **Fencing off and/ or restricting access to all areas potentially containing leachate impacted surface water and including adequate warning signs relating to the leachate \ stormwater infrastructure which could pose a risk to human health;**
  - **Investigate and implementation of a site wide surface water management plan aimed at improving surface water management across the site, including potential passive or active remediation options for the leachate seeps in the south-central portion of the site.**

5.1.3 Groundwater

The groundwater along the southern (down gradient) boundary of the site has been impacted by leachate, however, the interaction between the groundwater and the receiving environment (the Parramatta River) is not fully understood. Addressing the discharge of leachate-impacted surface water (refer to Section 5.1.2) is considered to be a higher priority, after which further assessment of groundwater conditions could be considered. **Monitoring of groundwater and surface water quality within the receiving environment (the Parramatta River) could be used as a trigger for whether further consideration of groundwater/leachate management is warranted.** Monitoring requirements are described in Sections 6.2.

5.1.4 Leachate

Leachate is water that has come into contact with waste. Currently, leachate generation has not been evaluated for the site. There are no active or passive leachate management measures installed at the site, and while site capping improvement works have been undertaken across the site there is an absence of a fully engineered cap. Consequently, infiltration rates across the site are likely to vary and will likely impact the volume of leachate being generated at the site. Capping and batter improvements are discussed in Section 5.4.

It is recommended that leachate generation be considered within a site wide water management plan. The water management plan should consider the integration of a long term leachate management program with the various management measures discussed within this report.

5.2 Air

5.2.1 On-Site Landfill Gas

The main risk associated with landfill gas on the site is associated with the potential accumulation of methane within the stormwater drain passing through the centre of the site. The Golder (2013) investigations also identified surface landfill gas emissions in excess of the NSW EPA Solid Waste Environmental Landfill Guideline (1996) trigger value of 500 ppmv at locations where users of the park assemble. Therefore, management measures should be targeted towards minimising the risk for gas accumulation to occur within the stormwater drain, and thereby reduce the potential health risks to workers who may enter the stormwater drain and also reduce the potential explosion hazard. Future development on the site involving the construction of concrete hard stand slabs and/or buildings will also need to consider the potential for gas accumulation beneath the slab thus producing an explosion hazard. Therefore. mitigation options should also be targeted towards the protection of site structures.

The following remediation and / or management actions are recommended to control the risks associated with the on-site landfill gas:

- **The existing stormwater drain passing through the site is potentially acting as a direct conduit for landfill gas and also has the potential to accumulate landfill gas within the pipe creating a potential explosion hazard. Specific controls associated with the stormwater pipe include:**
  - **Remediation of the pipe by repairing, replacing or removing the pipe, and/ or venting or capturing the landfill gas within the landfill such that the volume of methane entering the stormwater drain is minimised;**
  - **Implementing appropriate health and safety controls to manage the human health risks associated with the entering the stormwater pipe and the potential for methane accumulation to have occurred within the pipeline; and**
  - **Ensure all above ground structures and/or potential entry points to the stormwater drain are adequately guarded and ensure adequate warning signs identifying the hazards associated with the potential accumulation of methane within the stormwater infrastructure are in place.**
- **It is recommended that capping be improved in those areas of the site identified as having surface landfill gas emissions in excess of the NSW EPA Guidelines. Capping improvement may**

include the importation of additional capping materials, and / or the compaction of existing materials to minimise gas releases. An important aspect to be considered in the mitigation of landfill gas is the vegetation management as specified in Sections 5.4.

- **Future construction on the site is to includes the installation of an appropriately designed gas blanket and passive venting system designed specifically for the protection the proposed buildings and / or slabs being proposed on the site. For example a gas blanket may comprise of the following, however and appropriate ventilation system is to be designed for each specific building or slab:**
  - **A network of linked perforated HDPE piping in a trench backfilled with a 350mm thick layer of 10 to 20mm gravel which is in turn covered by a compacted clay liner, subsoil drainage layer and cover soil.**
  - **Above this blanket system the construction slab can be laid. The blanket should extend approximately 1 metre beyond the footprint of the building and/ or concrete slab.**
  - **The HDPE pipework within the gas blanket is connected to a vent pipe to allow any accumulated gas within the drainage system to vent freely to the atmosphere. The height of the vent pipe will extend above the height of the building to reduce the risk of venting gas entering the building. In order to maintain an effective mitigation system the vent pipe must be protected from vandalism.**

5.2.2 Odour

Odour is not expected to be significant concern on the site. However, given fugitive landfill gas emissions have been detected, and leachate impacted surface water is present in particular portions of the site, there is potential for malodorous odours to be detected at the site. The remedial actions described within sections 5.1 and 5.2.1 should reduce the potential for odours to be generated at the site. In addition, project specific management controls should be developed and implemented should future works involve exposing waste materials or include the management of significant quantities of leachate.

A record of complaints regards odours should be kept by PCC and reported to the EPA as required.

5.3 Vegetation

5.3.1 Investigation of Areas of Vegetation Stress

The purpose of the management action is to provide scope for assessment of the cause of vegetation dieback where and when it occurs on the site, and it to be employed whenever areas of vegetation dieback are identified which cannot be directly attributed to vegetation clearance, construction work or other earthworks in the general vicinity.

While unvegetated areas are identified on the cap and batters of the landfill through the course of its history no assessment of the likely source of these areas has been undertaken. This has implications for the proposed future landuse as vegetation dieback may be an indicator of changes to landfill gas and leachate conditions as well as exposure pathways to on-site users. An understanding of the source of the vegetation dieback can also allow for the planning of the most cost-effective and potentially successful option for revegetation.

Assessments targeting individual areas of vegetation dieback should be conducted whenever areas of exposed soils of greater than two metres diameter are identified. These assessments are to target the likely source of the dieback and should follow a “process of elimination” methodology which will assess possible sources in the following order:

- Dieback during drought and periods of low rainfall;
- Earthworks and deliberate vegetation clearing by Council and contractors;

- Fire and burning of vegetation;
- Ongoing soil erosion and degradation of soil quality following vegetation dieback;
- Leachate contamination; and
- Landfill gas migration.

This order has been selected as the initial potential sources can be easily identified by PCC personnel acquainted with the site and ongoing site activities without the need for engaging a consultant or conducting analysis or off-site testing. Where vegetation dieback is found to be the result of earthworks, fire, soil erosion and dieback resulting from drought this is to be documented in a log for the site as well as the general location and the revegetation works implemented. As a guide revegetation works should be conducted in general accordance with Section 5.3.2.

The assessment of potential leachate and landfill gas impacts will require a scope developed specifically for the individual location and should be conducted by a suitably qualified environmental engineer or scientist. Based upon the findings of the assessment a risk assessment may be required to assess the potential for impact to site users and environmental receptors. The assessment should inform the planning of revegetation, which should be undertaken in consultation with an appropriately qualified horticulturalist or aboriculturist. A record of the investigations and the assessment findings should be kept along with the plan for revegetation.

5.3.2 Revegetation Works

Species to be used when revegetating should be chosen with consideration of the previous and intended future use of the lands. Shallow rooted pasture grasses will be re-established in all areas and species used are to be consistent with pasture community that existed prior to the exposure. The pasture mix to be used will be determined in consultation with the PCC manager for the Site.

Revegetation is to be undertaken as soon as possible following identification of the exposed cap or batter or following completion of works in that area. Consideration will be given to seasonal conditions and hence optimal growth conditions. Seeding such as hydromulch (seedstock, binder/stabiliser and fertiliser) can be generally applied at any time, whereas tube stock should be planted preferably in late winter or spring. Seed mixes will be selected that allow rapid ground cover to be achieved. This may mean using a sterile grass that will establish quickly and assist establishment of the surrounding pasture community in the longer term.

5.3.3 Vegetation Maintenance

Operation and maintenance requirements for the vegetation cover include the following items:

a) Vegetative management and erosion inspections in areas where revegetation has occurred should be conducted at least quarterly for the first year and annually thereafter;

b) A weed control program shall be implemented. This program shall include follow-up weeding at least quarterly for the first year and shall target invasive species, deep rooted weed species and other deep rooted plants such as trees;

c) After the first year, long-term weeding as outlined in item b), shall be conducted on a yearly basis and may be combined with vegetative management inspections outlined in item a);

d) If areas of erosion are encountered, the area of erosion shall be scarified and revegetated. If erosion re-occurs in a particular area, then erosion control mats shall be installed; and

e) Areas without vegetation shall be revegetated and follow-up inspections until vegetation is established are required. Further watering may be required, particularly during prolonged dry and hot periods. Inspections would be undertaken monthly for the first year following rehabilitation construction.

5.3.4 Deep-rooted Vegetation Management

The presence of deep rooted vegetation (largely in the form of tall and woody plants) on the cap and batters of the site are a risk to the cap and batter integrity and provide pathways for gas and leachate emission as well as surface water infiltration. Management and regular removal of these plants from areas where there is insufficient capping depth to maintain them is intended to increase the effectiveness of the cap and batters and reduce the need for ongoing maintenance.

Future redevelopment and enhancement of the site vegetation through planting programs should be designed such that deep-rooted vegetation, if proposed is provided with sufficient growing medium such that they do not pose a potential risk to the cap and batter integrity.

5.4 Cap and Batter Management

The goal of this section of the Management Plan is to clearly define the benchmarks and management procedures required to maintain the quality of the site in regards to capping integrity. From previous investigations, it is understand that the site has been capped but there are some areas where the cap was found to be thinner than widely adopted best practice. It is understood, that in the intervening time since these investigations further capping works have taken place which may have addressed some issues with the cap and batters. Based on the results of the Golder 2013 investigations, capping in the following areas of the site requires improvement.

- A thin capping layer between 0.4m and 0.8m deep was observed within the north east and eastern portion of the site;
- Northern boundary of the baseball fields contained capping thicknesses of between 0.3m and 0.6m deep; and
- The western boundary of baseball fields, where capping the thickness was 0.6 m deep.

Prior to commencing any future redevelopment on the site a detailed assessment of the cap and batters within the proposed redevelopment and their respective thickness should be conducted to assess the need for further works and to assist with the adequate design of structures. Following the redevelopment activities (such as the construction of the recreational facilities) inspections of the cap and batters within the vicinity of the redevelopment shall be undertaken quarterly to ensure the integrity of the surface of the site. Should there be any damage to the surface from scour and / or subsidence the following maintenance shall be undertaken;

- If depressions deeper than 200 mm are encountered, they shall be backfilled with either topsoil or the topsoil shall be pulled back and the depression shall be filled with subsoil and levelled with topsoil and revegetated;
- Areas with depressions deeper than 500mm shall be located using GPS, and shown on a drawing. The drawing is to be included in the maintenance records for the site. If a similar depression re-occurs in a particular area, then an excavation shall be made in the area to inspect, and repair the cap if necessary;
- Following backfilling of depressions, the depression area shall be revegetated as outlined within Section 5.3.2;
- The site must be shaped and maintained to allow the correct surface water drainage; and
- **All works should be carried out with consideration to workers (and park users) health and safety. This particularly relates to the risks associated with exposure to landfill gas. Where any capping works or exposure of waste is to occur, a task specific health and safety analysis is to be performed (i.e. Safe Work Method Statement) which should take into consideration (but not limited to) exposure risks associated with LFG and explosion risks particularly where hot works are required.**

6.0 MONITORING

The management of the site is to be supplemented by an ongoing monitoring program in order to continually assess the effectiveness of the adopted site management processes. Monitoring locations are presented on Figure 3 (Appendix A). A checklist is provided in Appendix B summarising the monitoring requirements. This checklist should be filled out and submitted as an attachment to the annual environmental monitoring report (AEMR) submitted to PCC.

6.1 Landfill Gas

6.1.1 Surface Gas Emission Monitoring

Surface gas migration monitoring should demonstrate that the cover material is controlling the emission of landfill gas. This can be achieved by testing the atmosphere five centimetres above the ground surface in areas where wastes have been placed as outlined in Benchmark Technique 17 of the Solid Waste Landfill Guidelines (EPA 1996).

Appropriate instrumentation must be used in monitoring rounds, such as a Flame Ionisation Detector (FID) (detection limits of 0.00005 - 0.0001% or 0.5 - 1.0ppm). Routine surface gas monitoring should occur annually. In areas were excavation works have occurred or where significant re-development has occurred, monitoring should be completed quarterly during the works and for the first year following completion of the works, after which a review is to be conducted pending monitoring results. If results are within guideline limits, then the surface gas monitoring should be reduced to half yearly and then again after 1 year to annual monitoring rounds.

If results exceeding NSW guidelines are encountered, then daily monitoring should commence as specified in the NSW EPA *Solid Waste Landfill Guidelines* and a risk assessment should be conducted detailing the necessity and conceptual scope for remediation.

6.1.2 Sub-surface Gas Monitoring

Sub-surface gas monitoring should demonstrate that the lateral migration of landfill gas is not occurring. This can be achieved by routinely monitoring the landfill gas wells installed around the perimeter of the site.

Landfill gas monitoring devices should be capable of detecting landfill gas in sufficiently low concentrations to ensure that landfill gas is not migrating off-site, and that toxic air emissions are not a threat to the adjacent residential properties.

It is recommended routine annual sub-surface gas monitoring is undertaken at the 12 soil gas probes (GASV01 to GASV12) located along the northern site boundary. In areas were excavation works have occurred or where significant re-development has occurred, monitoring should be completed quarterly during the works and for the first year following completion of the works, after which a review is to be conducted pending monitoring results. If results are within guideline limits, then the surface gas monitoring will be reduced to half yearly and then again after 1 year to annual monitoring rounds.

If results exceeding NSW guidelines are encountered, notification to the NSW EPA is required within 24 hours of the exceedence. Daily monitoring should commence as specified in the NSW EPA *Solid Waste Landfill Guidelines* and a risk assessment be undertaken detailing the necessity and conceptual scope for remediation.

6.1.3 Gas Accumulation Monitoring

Landfill gas must not accumulate in buildings or under building slabs as this can pose a danger of explosion.

All current or future on-site buildings situated on-top or within close proximity of deposited waste (i.e. within 250 m of landfill) have the potential to accumulate methane. Methane concentrations of greater than 1.25% v/v in the subsurface should be tested on a quarterly frequency with the appropriate instrumentation (e.g. FID), to guideline detection limits. If any new buildings or areas of hardstand are to be built within this area they should be designed so as not to accumulate methane gas (refer to Section 5.2.1).

Buildings are not to have gas concentrations exceeding 1.25% methane v/v in the subsurface surrounding of beneath the building. If results exceeding NSW guidelines are encountered, notification to the NSW EPA is required within 24 hours of the exceedence. Daily monitoring should commence as specified in the NSW EPA *Solid Waste Landfill Guidelines* and a risk assessment be undertaken detailing the necessity and conceptual scope for remediation.

6.1.4 Gas Monitoring Methods

Landfill Gas Monitoring

Accumulated landfill gas measurements will be collected using a calibrated GEM2000 or GA2000 landfill gas analyser and flow pod (or similar). Field screening for landfill gas will be conducted by attaching the inlet hose of the gas analyser to a Teflon tube attached to the top of the gas probe. The sub-surface landfill gas will measure the following:

- Concentration by volume of methane (CH_4), peak and steady;
- Concentration by volume of carbon dioxide (CO_2), peak and steady;
- Concentration by volume of oxygen (O_2);
- Parts per million hydrogen sulfide (H_2S);
- Carbon monoxide (CO); and
- Flow rate (litres per hour).

Surface Gas Monitoring

Fugitive surface gas emissions will be screened using a FID. Measurements will be collected along transects at approximately 25 m separation. Deviations from the transects may occur if there are any suspected areas of fugitive emissions (i.e. areas where grass is brown or no grass is present). The walkover will be undertaken utilising a small funnel attached to the inlet hose of the FID and will be placed on the ground so that the inlet tube is at a height of 50 mm above the ground surface. When concentrations exceed typical background concentration (>5 ppm) the FID reading will be noted on the site plan in the corresponding location. If any exceedences of the assessment criteria (i.e. 500 ppmv) are encountered, a GPS coordinate will be taken. Exceedences will be reported to PCC immediately following the survey.

6.1.5 Remediation of Uncontrolled Landfill Gas Emissions

The purpose of remediating uncontrolled landfill gas emissions is to ensure that if methane is detected at greater than the recommended guidelines within the surface, subsurface or near buildings that further emissions are prevented. The EPA must be notified within 24 hours of detection of any landfill gas above the 1.25% v/v in subsurface monitoring locations and 0.05% v/v for surface monitoring locations.

The management strategies to be implemented upon detection of landfill gas depend on the characteristics of the detection(s). The specific action plan should be developed to suit the event, however, a brief summary of possible management approaches are described as follows:

- ***Surface Gas Emissions -*** Upon surface gas detection, an investigation into the integrity of the cap around the hotspot(s) should be undertaken to determine if any cracks or fissures have developed in the cap.
- ***Subsurface Gas Emissions -*** An extraction system could be implemented, although the limitations of a permanent system must be addressed. Temporary extraction wells may be more applicable.
- ***Building Accumulation -*** Should the monitoring program demonstrate that methane has been encountered above guideline limits then actions such as improving the ventilation within any on-site buildings, sealing pipe cavities and further monitoring or measures such as evacuation and exclusion of the area may be appropriate.

6.2 Groundwater

The purpose of the groundwater monitoring program is to provide PCC with information regarding spatial and temporal variation in contaminant concentrations within the site. This should act as a tool to allow for implementation of informed, cost effective management solutions where required.

The groundwater monitoring program should effectively monitor and report groundwater character, and ensure early detection and reporting of impact of groundwater. The groundwater assessment program should identify any irregular results of the groundwater monitoring program and therefore determine the extent of groundwater impact.

Ten groundwater monitoring wells (GAMW01 to GAMW10), installed during the Golder (2013) investigation are located across the site (refer to Figure 3, Appendix A). It is recommended that routine annual groundwater monitoring be carried out at all current locations. Following completion of remediation and/or significant redevelopment works, groundwater monitoring should be conducted on a bi-annual basis until contaminant concentrations in groundwater monitoring points are considered stable. At this time the monitoring regime should be reassessed, and annual monitoring continued.

Based upon previous groundwater investigations, and the contaminants encountered, the potential contaminants of concern, as presented in Section 2.3 is initially recommended for all the groundwater monitoring wells. The analytical program should be reviewed at the completion of each monitoring event to determine if a reduction in analytical scope is possible.

Groundwater contaminants should be assessed in accordance with the ANZECC 2000 criteria (or other suitable criteria where ANZECC 2000 does not provide thresholds). If a significant increase in contaminant concentrations in the groundwater is recorded, a groundwater assessment program should undertaken by a suitably qualified consultant, in accordance with the relevant guidelines. This assessment program should include:

- Identification of the specific contaminants and extent of the pollution to the groundwater; and
- An assessment of whether further investigation is required.

If required the following measures will be taken:

- Assessment of the requirement for notification to the NSW EPA of results exceeding agreed limits in accordance with the *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act, 1997 (if not already undertaken)*;
- A revised list of sample analytes will be provided along with the rationale for their inclusion or removal; and
- A revised monitoring program will be outlined for sampling the existing wells and/ or installation of additional wells.

6.2.1 Groundwater Monitoring Method

Well Installation

Where required additional monitoring wells are to be installed using the following methods:

- Geological conditions encountered during the drilling/augering including soil type, colour, odour, particle size and moisture condition will be logged and presented with the well construction for reporting.
- The wells will be constructed as following:
  - A 50 millimetre (mm) diameter Class 18 PVC well (0.5 mm slotted screens) will be installed from the base of the borehole across and to a minimum of 0.5m above the groundwater table;

- A 50 mm class 18 PVC casing will be used to complete the construction of the well from the screen to the surface level;
- A gravel graded 2 mm pack around and up to a maximum of 0.5 m above the screen;
- A bentonite clay plug is to be placed above the gravel pack and will be sealed to the ground surface; and
- A bolt down flush type heavy duty cover will generally be installed slightly above ground level to allow for ease of location during future monitoring rounds. Where there may be a potential risk for a trip hazard, the gattic cover will be flush mounted with the ground surface. Where there may be a potential for the monitoring location to be lost due to vegetation growth, lockable steel standpipe covers will be installed.

- The completed permanent groundwater monitoring well construction will be documented on the borehole log sheet.
- Following installation wells will be developed to remove residues from the drilling and facilitate the hydraulic connection of the well with the aquifer. Wells must be developed prior to purging and sampling.

Groundwater sampling

All groundwater sampling will be conducted using low-flow sampling techniques with the aid of a peristaltic pump (or similar). The sampling process is described as follows:

- The water level and the well depth will be measured with an interface probe calibrated to manufacturer's specification by the supplier. The calibration records will be retained by the field scientist performing the sampling;
- New dedicated disposable tubing will be used at each location. Non dedicated field equipment will require decontamination between sampling locations. Rinsate samples should be collected to demonstrate effective decontamination procedures;
- A physical description of the sample will be recorded on the field data sheets including:
  - Colour;
  - Turbidity;
  - Odour; and
  - Films/sheens.
- Field parameters will be measured at the start of purging, at regular intervals throughout the purging and immediately before a sample is collected. The field parameters will be measured using a calibrated multi-parameters water quality meter (e.g. a YSI or 90FLMV) and include the following:
  - pH;
  - EC;
  - Temperature;
  - DO; and
  - Redox potential.
- Calibration of the water quality meter will be performed at the start of each working day and calibration records will be retained by the field scientist;

- When parameters have stabilised (considered to be the point where the results of consecutive readings vary by less than 10%), or three well volumes have been purged a sample may be collected;
- If groundwater recharge is too slow to allow either stabilisation of parameters or removal of three well volumes. In this case wells will be purged dry, allowed to recover overnight and then sampled directly the following morning; and
- Should the purged water appear to be impacted based on visual or olfactory assessment the water should be temporarily stored in drums for disposal in accordance with all applicable regulations.

6.3 Surface Water

The purpose of the surface water monitoring program to provide PCC with information regarding spatial and temporal variation in contaminant concentrations within the site and the surrounding receiving environment, and to allow for the implementation of informed, cost effective management solutions where required.

The Golder 2013 investigations included the collection of 12 surface water samples from across the site and within the surrounding receiving environment. The rationale for each of the sampling locations is included within the following table, and their location is presented on Figure 3 (Appendix A).

Table 4: Surface Water Sample Location Rationale

Surface Water I.D.	Rationale
SW1	Up-gradient stormwater pipe sample.
SW2	Mid-stream stormwater pit located adjacent to bike track. To provide delineation of water quality within the stormwater pipe.
SW3 (outlet of major stormwater drainage pipe)	Outlet located at sea wall. Provide an indication of seepage of leachate into the Parramatta River.
SW4 (eastern creek)	To provide assessment for potential seepage into the location previously known as ‘eastern creek’ to the east of the landfill.
SW5 (discharge line west of reserve)	Provide assessment of water quality of stormwater exiting the site to the west.
SW6	Upriver to provide background water quality of the Parramatta River.
SW7, SW8 & SW9 (edge of river)	Mid-gradient samples to assess water quality of the Parramatta River.
SW10 to SW 12	Seepage locations along the toe of the landfill batter.

It is recommended that routine annual surface water monitoring be initially carried out at all current locations with analysis for the potential contaminants of concern, as presented in Section 2.3. The analytical program should be reviewed at the completion of each monitoring event to determine if a reduction in analytical scope is possible. Following completion of remediation and/or significant redevelopment works surface monitoring should be conducted on a bi-annual basis until works are complete, and for 1 year following the completion of the works. At this time the monitoring regime should be reassessed, and annual monitoring continued.

6.3.1 Surface Water Monitoring Method

Surface water grab samples will be collected at both existing and suitable locations surrounding the landfill and at the boundary with the Parramatta River. Water quality parameters will be recorded in the field using a calibrated multi-parameter water quality meter (YSI or 90FLMV) as following:

- pH;
- Electrical conductivity (EC);
- Temperature;

- Dissolved oxygen (DO); and
- Redox potential.

Where possible, the water quality meter probe will be placed directly in the surface water body in order to obtain a representative reading. Additionally, a detailed description of the condition of the water sample will be recorded, including visual clarity, presence of turbidity or precipitates, nature of the water body (still or flowing), or if any odours are present.

6.4 Settlement Monitoring

The purpose of the settlement monitoring program is to assess the settlement across the site over time along with the associated risks to infrastructure and people on-site and to assist in the planning for future re-development of the site.

The methodologies and scope employed for the implementation of a settlement monitoring program will vary dependent upon the details of the final landuse (including design of buildings and other infrastructure). Therefore, more detailed scopes for implementation of a monitoring program will need to be devised as required subject to the proposed development works. However, the monitoring methods which may be employed to assess settlement may include the following:

- Installation and periodic monitoring of settlement plates at discrete locations across the Site;
- Annual ground survey of the cap and batters (10 metre grid spacing); or
- Regular site walkovers identifying local areas of sagging and depression on the cap and batters.

7.0 ADDITIONAL INFORMATION

This environmental management plan has been prepared specifically for the identified environmental risks present on the site. The ongoing operation of the site will require the development and implementation of a range of additional Site Management Plans. These may include but not be limited to the following:

- An Operation and Maintenance Health and Safety Plan.
- An Excavation Management Plan.
- A Construction Environmental Management Plan (CEMP). Any project specific CEMPs should be prepared in compliance with Department of Infrastructure, Planning and Natural Resources (DIPNR) (2004), *Guideline for the Preparation of Environmental Management Plans* and include but not be limited to the management of:
  - Site works;
  - Stakeholders (Council, NSW EPA, NSW EPA Accredited Site Auditor (if appointed), Community, etc);
  - Noise impacts;
  - Air quality and dust emission;
  - Groundwater (treatment and/or disposal);
  - Landfill gas emission risk;
  - Impacted runoff;
  - Stormwater; and
  - Waste management.
- A Stakeholder Engagement and Community Relation Plan (where required).

7.1 Contingencies / Unexpected Finds

Due to historical landuse, sub-surface conditions and leachate impacts identified, further contamination or other related issues may be identified on the site, these may include illegally dumped materials and spatial variability in waste composition, landfill gas production across the site or the location of leachate seepages.

If during the implementation of this EMP or during future site works, if additional impacts or unexpected finds are encountered, the following methodology should be implemented.

- The PCC Site Manager will be notified immediately of any incident or find. The PCC Site Manager will investigate the incident or potential impact identified;
- Subject to the initial inspection by the PCC Site Manager appropriate safeguards which may include fencing the area, covering the impacted materials or implementing odour suppression, etc. The PCC Site Manager will then be notified of all incidents immediately and will contact the NSW EPA and relevant agencies if required;
- Contamination identified will be managed in accordance with the objectives outlined within this EMP;
- The impacts or contaminated materials will be investigated in accordance with relevant NSW EPA Guidance, and an appropriate management approach derived through a risk assessment process. If the material is unsuitable to be retained on the site it will then be managed in accordance with the NSW DECCW 2009 *Waste Classification Guidelines*; and

- The results of the investigation works should include recommendations for corrective actions and subsequent amendments to the EMP. The results of the investigations and corrective actions will be detailed within the AEMR, or separately, depending on the nature of the unexpected find.

7.2 Roles and Responsibilities

Table 5: Roles and Responsibilities of Personnel for Implementing this EMP

Role	Responsibility
PCC Manager of City Assets and Environment (or delegate as appointed)	Overall responsibility for EMP and outcomes. Authorisation of changes to this EMP. Liaison with other government agencies in regards to the environmental aspects of the site
PCC Site Manager (or delegate as appointed)	Day-to-day implementation of EMP. Induction of PCC staff and appointed contractors on to the EMP. Monitoring compliance with the EMP Liaison with other government agencies in regards to the environmental incidents requiring immediate notification
PCC Contractor Supervisor / Works Foreman (or delegate as appointed)	Day to day Implementation of EMP. Site management to allow activities to proceed without environmental incident. Monitoring compliance with this EMP
PCC Worker / Contractor	Day to day Implementation of EMP. Adherence with this EMP. Reporting any unexpected finds or non-compliances with the EMP
PCC Project Officer Contaminated Lands (or delegate as appointed)	Guidance on the day to day Implementation of EMP. Monitoring compliance with the EMP On call to assist with response and management of any unexpected environmental concerns encountered during site activities or non- compliances Preparation of Annual Environmental Management Report, including implementation of changes and corrective actions. Assistance in the induction of PCC staff and appointed contractors on to the EMP. Assistance in the liaison with other government agencies, as required

Controlled copies of this EMP are to be issued to the appropriate staff and contractors. All PCC employees on-site and contractors are to be aware of their environmental responsibilities. All PCC staff on-site, and contractors will be inducted into the requirements of this EMP.

Any changes to the EMP must be documented and signed off by the PPC Manager of City Assets and Environment (or their delegate as appointed). A register for changes is to be found in **Appendix C.**

Where work is likely to require liaison with other government agencies, this liaison should be undertaken as early as possible by the PCC Manager of City Assets and Environment and with consultation and involvement of the PCC Project Officer Contaminated Lands.

7.3 Non Compliance

If during the implementation of this EMP or during future site works, non-compliance with this EMP is identified, the following methodology should be implemented.

- The PCC Site Manager will be notified immediately of any actual or potential non-compliance and the PCC Site Manager will investigate;
- Subject to the initial inspection by the PCC Site Manager, appropriate safeguards and corrective / preventative actions will be implemented. The PCC Site Manager will then notify, the PCC Manager City Assets and Environment and the Project Officer Contaminated Lands;
- Corrective and preventative actions will be implemented in accordance with the objectives outlined within this EMP; and
- The results of the non- compliance investigation including the implemented corrective or preventative actions and recommendations for subsequent amendments to the EMP will be detailed within the AEMR, or separately, depending on the nature of the non-compliance.

8.0 REPORTING

Because the site is not covered by an Environmental Protection Licence under the *Protection of the Environment Operations Act 1997* PCC is not immediately obligated to report to NSW EPA with regard to environmental performance and monitoring results. However, under the *Contaminated Land Management Act 1997* Council must comply with the *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*.

It is recommended that the routine annual and non-routine monitoring be documented through the preparation of an annual environmental monitoring report (AEMR). The AEMR should include the following information (but not limited to):

- Introduction and background;
- Methodologies utilised;
- Summary of field and analytical results;
- Conclusion and/or discussion regarding results and historical trends; and
- Recommendations or further actions that may be required including amendments to the EMP.

The AEMR should be addressed to the PCC Manager of City Assets and Environment.

9.0 REFERENCES

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National Health and Medical Research Council (NHMRC), 2008 *Guidelines for Managing Risks in Recreational Water.*

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NSW Department of Environment and Climate Change (NSW DECC), June 2009, *Contaminated Sites: Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*

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NSW EPA, January 1996, *Environmental Guidelines: Solid Waste Landfills*

NSW EPA, September 1995, *Contaminated Sites: Sampling Design Guidelines*

NSW EPA November 1997, *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*

10.0 LIMITATIONS

This Document has been provided by Golder Associates Pty Ltd ("Golder") subject to the following limitations:

- This Document has been prepared for the particular purpose outlined in Golder's proposal and no responsibility is accepted for the use of this Document, in whole or in part, in other contexts or for any other purpose.
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- Conditions may exist which were undetectable given the limited nature of the enquiry Golder was retained to undertake with respect to the site. Variations in conditions may occur between investigatory locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the Document. Accordingly, additional studies and actions may be required.
- In addition, it is recognised that the passage of time affects the information and assessment provided in this Document. Golder's opinions are based upon information that existed at the time of the production of the Document. It is understood that the Services provided allowed Golder to form no more than an opinion of the actual conditions of the site at the time the site was visited and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.
- Any assessments made in this Document are based on the conditions indicated from published sources and the investigation described. No warranty is included, either express or implied, that the actual conditions will conform exactly to the assessments contained in this Document.
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Report Signature Page

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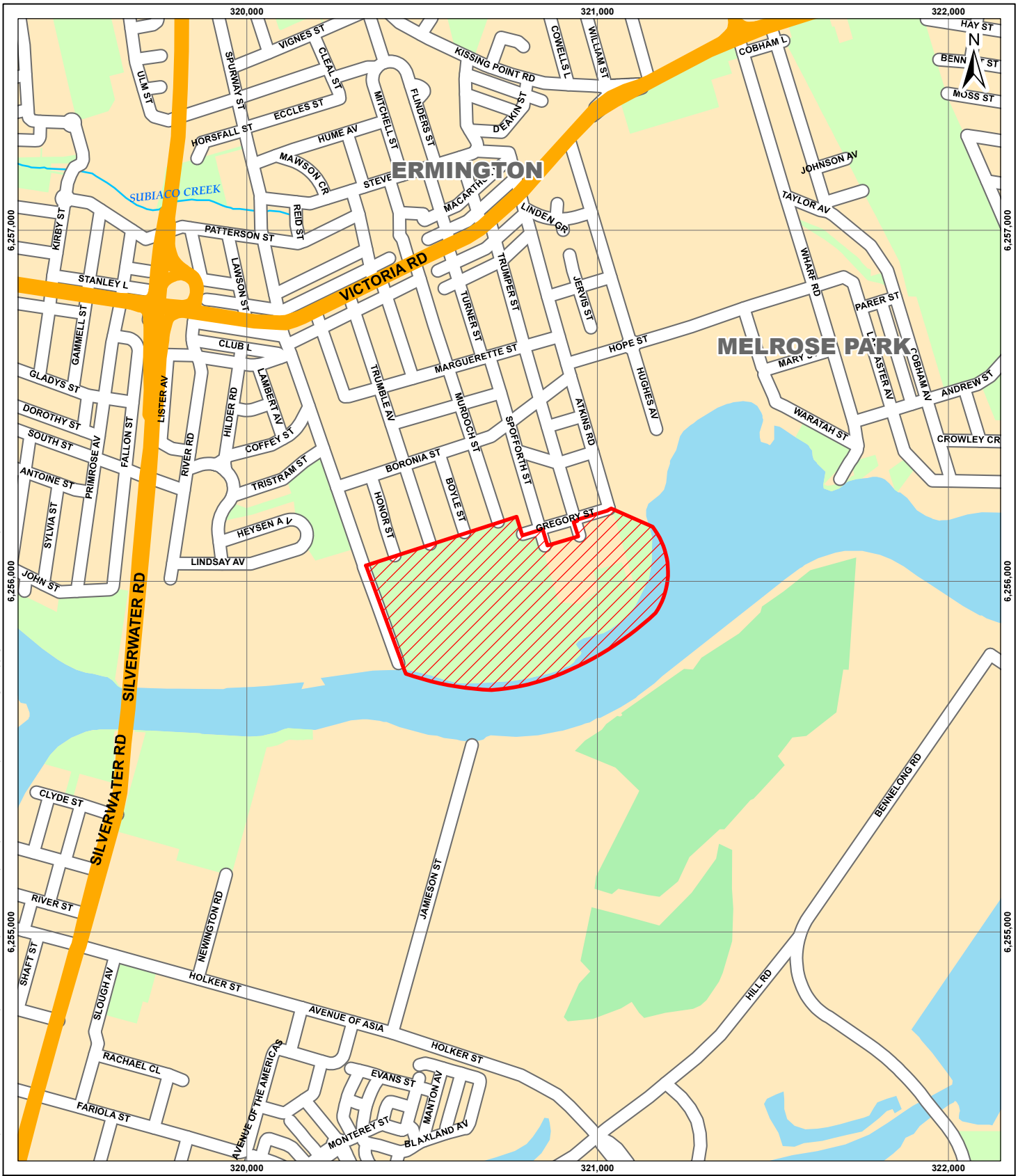
APPENDIX A

Figures



ENVIRONMENTAL MANAGEMENT PLAN
GEORGE KENDALL RIVERSIDE PARK

PARRAMATTA CITY COUNCIL

SITE LOCALITY

LEGEND

Site Location

0 50 100 200 300 400 500 metres

SCALE (at A4) 1:15,000

Coordinate System: GDA 1994 MGA Zone 56

PROJECT: 147623007
DATE: 5/05/2014
DRAWN: FA
CHECKED: DM

FIGURE 1

NOTES

Site boundary is approximate.

Golder Associates

File Location: J:\env\2014\147623007_PCC_EMP_George Kendall Reserve\Technical Docs\GIS\Project\147623007_001_R_F001_Rev0_SiteLocality.mxd

ENVIRONMENTAL MANAGEMENT PLAN
GEORGE KENDALL RIVERSIDE PARK

PARRAMATTA CITY COUNCIL

SITE LAYOUT AND KEY FEATURES

LEGEND

- Site Extent
- Facilities

NOTES

Site boundary is approximate and indicative.

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1. Aerial Photography Copyright NearMap Pty Ltd.
   Image dated 2012.05.09.
   Sourced with permission from Nearmap on 2012.07.17
   Image Georeferenced by Golder and intended for indicative purposes only.
   More information can be found here: http://www.nearmap.com/

2. Base map data copyright MapInfo Australia Pty Ltd

0 15 30 60 90 120 150 metres

SCALE (at A3) 1:3,000

Coordinate System: GDA 1994 MGA Zone 56

PROJECT: **147623007**
DATE: **5/05/2014**
DRAWN: **FA**
CHECKED: **DM**

FIGURE 2

Golder Associates

File Location: J:\env\2014\147623007_PCC_EMP_George Kendall Reserve\Technical Docs\GIS\Project\147623007_001_R_F002_Rev0_SiteLayout.mxd

ENVIRONMENTAL MANAGEMENT PLAN
GEORGE KENDALL RIVERSIDE PARK

PARRAMATTA CITY COUNCIL

SOIL GAS PROBE, GROUNDWATER AND SURFACE WATER LOCATIONS

LEGEND

- Soil Gas Probe Locations
- Groundwater Well Locations
- Surface Water Sample Locations
- Site Extent

NOTES

Proposed sampling locations and site boundary is approximate and indicative.

COPYRIGHT

0 15 30 60 90 120 150 metres

SCALE (at A3) 1:3,000

Coordinate System: GDA 1994 MGA Zone 56

PROJECT: **147623007**
DATE: **5/05/2014**
DRAWN: **FA**
CHECKED: **DM**

FIGURE 3

Golder Associates

File Location: J:\env\2014\147623007_PCC_EMP_George Kendall Reserve\Technical Docs\GIS\Project\147623007_001_R_F003_Rev0_GasProbes.mxd

APPENDIX B

Monitoring Checklist

Environmental Management Plan Inspection/Monitoring Checklist **George Kendall Reserve**

Area	Part	Inspection Observations	Comments / Rectification Works Required?	Performed (Y/N)	Date / Initials
General	Date				
	Rainfall	Record details of rainfall in previous 24 hours.			
	Other				
Capping	Condition	Have sections of the capping been eroded? (refer to Section 5.1)			
	Ponding	Is there evidence of surface water ponding within any sections of the landfill surface? (refer to Section 5.1)			
	Grass and tree quality	Are the grass and/or trees showing signs of distress? (refer to Section 5.3)			
	Other	Check for anything else that appears to have impacted the effectiveness of the capping.			
Sea Wall Inspection	Sea wall	Undertake inspection of sea wall to identify for pipes and/or direct discharge of leachate impacted groundwaters.			
	Surface Seepages	Inspect for overland flows/seepage of impacted surface waters.			
	Mangroves	Are the mangroves of a healthy appearance?			
Monitoring	Groundwater	Undertake monitoring at all locations as specified in Figure 3 and Section 6.2.			
	Surface Water	Undertake monitoring at all locations as specified in Figure 3 and Section 6.3.			
	Subsurface Gas	Undertake monitoring at all locations as specified in Figure 3 and Section 6.1.2			
	Surface Gas	Undertake monitoring at all locations as specified in Section 6.1.1			
	Building Gas Accumulation	Undertake monitoring at all locations as specified in Section 6.1.3			

APPENDIX C

Register of Changes

APPENDIX C
Register of Changes

Table C1: Register of Changes			
Change No.	**EMP Section Reference**	**Change Made By**	**Change Approved By**

j:\env\2014\147623007_pcc_emp_george kendall reserve\correspondence out\appendices_001\app c - register of changes.docx

At Golder Associates we strive to be the most respected global company providing consulting, design, and construction services in earth, environment, and related areas of energy. Employee owned since our formation in 1960, our focus, unique culture and operating environment offer opportunities and the freedom to excel, which attracts the leading specialists in our fields. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees who operate from offices located throughout Africa, Asia, Australasia, Europe, North America, and South America.

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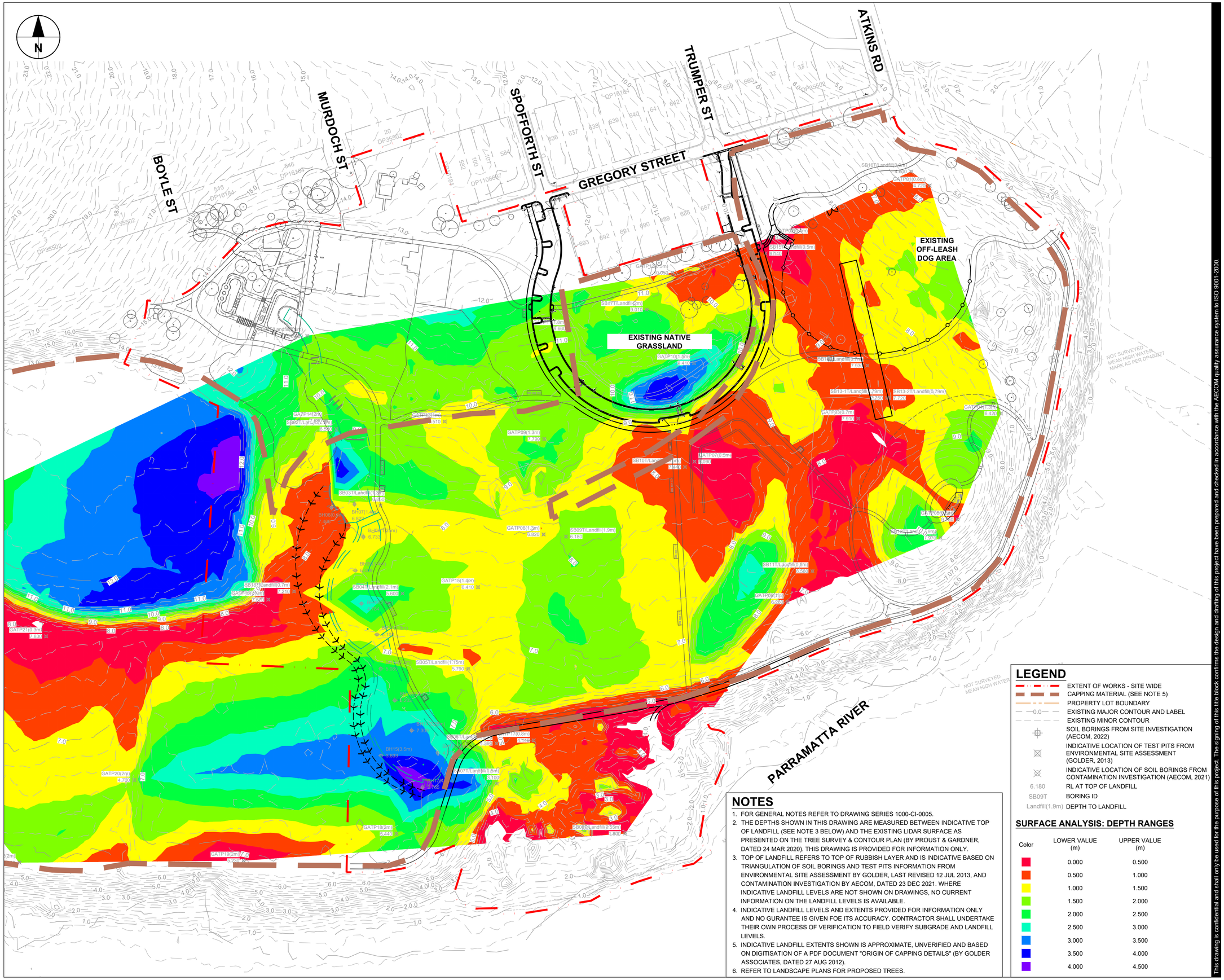
Golder Associates

ISO A1 594mm x 841mm



NOTES

1. FOR GENERAL NOTES REFER TO DRAWING SERIES 1000-CI-0005.
2. THE DEPTHS SHOWN IN THIS DRAWING ARE MEASURED BETWEEN INDICATIVE TOP OF LANDFILL (SEE NOTE 3 BELOW) AND THE EXISTING LIDAR SURFACE AS PRESENTED ON THE TREE SURVEY & CONTOUR PLAN (BY PROUST & GARDNER, DATED 24 MAR 2020). THIS DRAWING IS PROVIDED FOR INFORMATION ONLY.
3. TOP OF LANDFILL REFERS TO TOP OF RUBBISH LAYER AND IS INDICATIVE BASED ON TRIANGULATION OF SOIL BORINGS AND TEST PITS INFORMATION FROM ENVIRONMENTAL SITE ASSESSMENT BY GOLDER, LAST REVISED 12 JUL 2013, AND CONTAMINATION INVESTIGATION BY AECOM, DATED 23 DEC 2021. WHERE INDICATIVE LANDFILL LEVELS ARE NOT SHOWN ON DRAWINGS, NO CURRENT INFORMATION ON THE LANDFILL LEVELS IS AVAILABLE.
4. INDICATIVE LANDFILL LEVELS AND EXTENTS PROVIDED FOR INFORMATION ONLY AND NO GURANTEE IS GIVEN FOE ITS ACCURACY. CONTRACTOR SHALL UNDERTAKE THEIR OWN PROCESS OF VERIFICATION TO FIELD VERIFY SUBGRADE AND LANDFILL LEVELS.
5. INDICATIVE LANDFILL EXTENTS SHOWN IS APPROXIMATE, UNVERIFIED AND BASED ON DIGITISATION OF A PDF DOCUMENT "ORIGIN OF CAPPING DETAILS" (BY GOLDER ASSOCIATES, DATED 27 AUG 2012).
6. REFER TO LANDSCAPE PLANS FOR PROPOSED TREES.

LEGEND

- EXTENT OF WORKS - SITE WIDE
- CAPPING MATERIAL (SEE NOTE 5)
- PROPERTY LOT BOUNDARY
- 0.0 EXISTING MAJOR CONTOUR AND LABEL
- EXISTING MINOR CONTOUR
- SOIL BORINGS FROM SITE INVESTIGATION (AECOM, 2022)
- INDICATIVE LOCATION OF TEST PITS FROM ENVIRONMENTAL SITE ASSESSMENT (GOLDER, 2013)
- INDICATIVE LOCATION OF SOIL BORINGS FROM CONTAMINATION INVESTIGATION (AECOM, 2021)
- 6.180 RL AT TOP OF LANDFILL
- SB09T BORING ID
- Landfill(1.9m) DEPTH TO LANDFILL

SURFACE ANALYSIS: DEPTH RANGES

Color	LOWER VALUE (m)	UPPER VALUE (m)
	0.000	0.500
	0.500	1.000
	1.000	1.500
	1.500	2.000
	2.000	2.500
	2.500	3.000
	3.000	3.500
	3.500	4.000
	4.000	4.500

AECOM

PROJECT

George Kendall
Riverside Park
Ermington

CLIENT

New South Wales
Department of Planning
and Environment
Parramatta Square, 12 Darcy Street
Parramatta NSW 2150
www.planning.nsw.gov.au
ABN: 36 691 806 169

CONSULTANT

AECOM Australia Pty Ltd
A.B.N 20 093 846 925
www.aecom.com

SAFETY IN DESIGN INFORMATION

ARE THERE ANY ADDITIONAL HAZARDS / RISKS NOT NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING?
☐ NO
☐ YES

SCALE BAR

0 25 50 m
1:1000

FOR CONSTRUCTION

PROJECT MANAGEMENT INITIALS

VE	JM	JB
DESIGNER	CHECKED	APPROVED

ISSUE/REVISION

0	05.06.2023	FOR CONSTRUCTION
I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60641802

SHEET TITLE

SITE WIDE
EXISTING CAPPING DEPTH
ISOPACH PLAN

SHEET NUMBER

60641802-GKRP-SHT-DD-0000-CI-0602

Last saved by: MARJORIE.CALDA(2023-06-01) Last Plotted: 2023-06-02
Filename: C:\PW\WORKING\AECOM_DS10_AU\MARJORIE.CALDA@AECOM.COM\D0434295\60641802-GKRP-SHT-DD-0000-CI-0602.DWG

Appendix 13: Mitigation Measures

1 Introduction

Part 5 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) provides for certain works to be undertaken as development without consent.

To ensure that the development activity, being the upgrade works to George Kendall Riverside Park, forming part of the Parramatta Cycleway Upgrades project is carried out in accordance the provisions of Part 5 of the EP&A Act, **Section 2.1** of this document identifies the plans / documents (and any amendments approved under Part 5) which have been relied upon for the purposes of this assessment.

The remainder of this document sets out the mitigation measures that are to be implemented during the carrying out of the works to ensure impacts are avoided, mitigated or minimised to an acceptable level.

2 Mitigation Measures

2.1 Authorised Documents

The development activity must be implemented generally in accordance with the REF prepared by DFP Planning Pty Ltd dated 26 November 2024 and the documents listed in **Table 1**, which are authorised for the carrying out of works as development without consent.

Table 1 Authorised Documents

Survey Plan prepared by City of Parramatta			
Drawing Reference	**Revision**	**Name of Plan**	**Date**
-	-	Survey – George Kendall Riverside Park, Ermington	October 2024
Other Supporting Documents			
Document		**Prepared By**	**Date**
Landscape Plans		City of Parramatta	29 January 2025
Civil Plans		City of Parramatta	12 March 2025
Arborist Report		Hugh The Arborist	23 December 2024
Flora and Fauna Assessment Report		East Coast Ecology	26 March 2025
Geotechnical Report		Douglas Partners	17 January 2025
Heritage Impact Statement		DFP Planning	28 January 2025
AHIMS Search		NSW Heritage	4 October 2024
Community Engagement Report		City of Parramatta	February 2025
Environmental Management Plan		Golder Associates	27 June 2014

In the event of any inconsistency between the authorised documents and a mitigation measure hereunder, the mitigation measure shall prevail.

2.2 Amendment Tracking

Where there are any amendments to the authorised documents, an amendment register must be prepared which identifies the proposed amendment and demonstrates how the amendments will result in development that is substantially the same as the development to which the original REF applied.

Appendix 13: Mitigation Measures

2.3 Measures to be Implemented Prior to Works Commencing

2.3.1 Council Notification

The City of Parramatta (Council) shall be advised in writing of the date it is intended to commence work, including demolition. A minimum period of seven (7) days notification shall be given.

2.3.2 Notification to occupiers of adjoining land

Adjoining land owners shall be advised in writing of the date it is intended to commence work, including demolition. A minimum period of seven (7) days notification shall be given.

2.3.3 Final Construction Traffic Management Plan (CTMP)

A Final Construction Traffic Management Plan shall be prepared prior to the commencement of any works and approved by Council.

2.3.4 Final Construction Management Plan (CMP)

A Final Construction Management Plan (CMP) shall be prepared prior to commencement of any works and approved by Council.

2.3.5 Utilities and Services

Prior to commencement of any demolition activities, any services near the works site which may be impacted by the works are to be accurately located.

Dial Before You Dig should be contacted prior to the commencement of any works.

Prior to commencement of works, and if required, an application for a compliance certificate is to be made to Sydney Water or other evidence of Sydney Water's non-objection to the commencement of work on the basis of service availability is to be provided.

2.3.6 Tree Protection Measures

Tree protection measures are to be installed in accordance with the Tree Protection Specification provided as part of the authorised Arboricultural Impact Assessment prepared by Hugh The Arborist, dated 23 December 2024.

A Tree Protection Plan must be prepared which illustrates TPZ sensitive construction zones and exclusion zones prior to the commencement of works.

Tree protection fencing and signage must also be implemented to minimise any potential impacts upon retained trees prior to the commencement of works

2.3.7 Compliance with the Building Code of Australia and Australian Standards

Any works that are required to be undertaken in accordance with the National Construction Code (NCC) must be designed and constructed in accordance with the relevant provisions of the BCA and any relevant Australian Standards.

2.4 Measures to be implemented During Demolition and Construction

2.4.1 Site Notice

A site notice must be prominently displayed in a prominent position at the site during construction to inform the public of project details, and must satisfy the following requirements:

1. The site notice(s) must be durable and weatherproof and must be displayed throughout the works period;
2. Include details of the approved hours of work, the name of the builder, Certifier, structural engineer, site/project manager, the responsible managing company (if any), its address and 24-hour contact phone number for any inquiries must be displayed on the site notice(s); and

3. The site notice(s) must be mounted at eye level on the perimeter hoardings/fencing and must state that unauthorised entry to the site is not permitted.

2.4.2 Complaints Management

A Complaints Register is to be established during construction works. Action taken or proposed to be taken must be documented on the register in response to complaints raised.

2.4.3 No Obstruction of Public Way

Building materials, machinery, vehicles, refuse, skip bins or the like must not be stored or placed in the public way (outside of any approved construction works zone). A secure site compound must be provided on site and outside the flood zone.

2.4.4 Implementation of Final CMP

All demolition and construction works are to be undertaken in accordance with the Final CMP.

The CMP must include measures for erosion and sediment control, which are to remain in place for the duration of the demolition and construction works.

Temporary site traffic management measures must also be implemented to provide for pedestrian, cyclist and vehicular safety.

2.4.5 Demolition

Demolition work must comply with the demolition work plans required by Australian Standard AS 2601-2001 The demolition of structures (Standards Australia, 2001) and endorsed by a suitably qualified person.

2.4.6 Work Hours

Unless otherwise agreed by the relevant statutory body, work hours shall be limited to:

(a) Monday to Friday: 7.00am to 6:00pm;

(b) Saturday: 8.00am to 1.00pm

(c) Sunday and Public holidays: No work unless prior approval from Council is granted.

2.4.7 Unexpected Finds Protocol – Aboriginal Heritage

In the event that unexpected Aboriginal objects, sites or places (or potential Aboriginal objects, site or places) are discovered during construction, all works in the vicinity should cease and the proponent should determine the subsequent course of action in consultation with a heritage professional and/or the relevant State government agency as appropriate.

If surviving A Horizon soils are identified during the construction earthworks, it is recommended that an observer with knowledge of Aboriginal cultural objects (e.g. registered Aboriginal stakeholder) is present.

If human skeletal material less than 100 years old is discovered, the *Coroners Act 2009* requires that all works should cease, and the NSW Police and the NSW Coroner's Office should be contacted. Should the skeletal material prove to be archaeological Aboriginal remains, notification shall be given to Heritage NSW, the Local Aboriginal Land Council and the Commonwealth Minister for the Environment.

2.4.8 Unexpected Finds Protocol – Historic Heritage

If any unexpected archaeological relics are uncovered during the work, then all works must cease immediately in that area and the NSW Heritage Division contacted. Depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area. Works may only recommence with the written approval of the NSW Heritage Division.

Appendix 13: Mitigation Measures

2.4.9 Contamination

All areas of significant excavation are to be tested, classified and disposed of offsite if necessary. A copy of relevant waste classification reporting and evidence of disposal at a licenced waste facility is to be provided to Council.

A risk assessment is to be prepared and implemented for the planting of trees by a suitably qualified contamination consultant having regard to the Environmental Management Plan and location and depth of the capping layer. The landscape design must incorporate the recommendations of the risk assessment which may include the use of mounding or shallow-rooted tree species. .

2.4.10 Unexpected Finds

If unexpected-contaminated material is encountered during the works, all work shall cease, the site will be secured and a safe work method statement(s) and appropriate documented practices would be implemented to ensure the site it suitable for its use.

2.4.11 Tree Protection

All works must be undertaken consistent with the tree protection requirements set out in the Arboricultural Impact Assessment Report prepared by Hugh The Arborist, dated 23 December 2024.

Any works within the Tree Protection Zone (TPZ) must be undertaken under the supervision of a suitably qualified arborist.

2.4.12 Ecology

Exclusion zones will be set up at the limit of clearing in accordance with Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects (TfNSW, 2024)

2.4.13 Erosion and Sediment Control

Appropriate erosion and sediment control should be erected and maintained at all times during construction in order to avoid the potential of incurring indirect impacts on biodiversity values. Erosion and sediment controls would be established in accordance with an erosion and sedimentation plan to be produced for the proposed works. As a minimum, such measures should comply with the relevant industry guidelines such as ‘the Blue Book’ (Landcom, 2004).

2.4.14 Storage and Stockpiling

Allocate all storage, stockpile, and laydown sites away from any vegetation that is planned to be retained and flood zone. Avoid importing any soil from outside the site in order to avoid the potential of incurring indirect impacts on biodiversity values as this can introduce weeds and pathogens to the site. If materials are required to be imported for landscaping works, they are to be sterilised according to industry standards prior to importation to site.

2.5 Measures to be implemented – Prior to Occupation

2.5.1 Landscaping Certification

At the completion of the activity, a Landscape Completion Certificate for the proposed landscaping must be issued.

2.5.2 Arborist Certification

At the completion of the activity, a Level 5 qualified Arborist is to certify that the tree protection measures were undertaken in accordance with the Tree Protection Plan and the Tree Protection Specifications