Transport for NSW

Parramatta Light Rail Stage 2

Key Fish Habitat Offset Strategy

January 2025

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Revision	Revision Date	Status	Description	Author/Company	Reviewer/Approver
A	05 Dec 24	Draft	Draft Key Fish Habitat Offset Strategy	TfNSW Senior Environmental & Sustainability Officer	TfNSW Environment & Sustainability Manager
B	14 Jan 25	Draft	Addressing comments from consultation	TfNSW Senior Environmental & Sustainability Officer	TfNSW Environment & Sustainability Manager

Acknowledgement of Country

Transport for NSW would like to acknowledge the Traditional Custodians of the land on which Parramatta Light Rail Stage 2 project is situated, the Burramattagal, the Wangal and the Wategora clans of the Dharug nation.

Transport for NSW pays its respects to Elders past and present and recognises and celebrates the diversity of Aboriginal peoples and their ongoing cultures and connections to the lands and waters of NSW.

Glossary and Definitions

Acronym / Term	Description
Amendment Report	The Amendment Report submitted to the Planning Secretary under clause 179(3) of the Environmental Planning and Assessment Regulation 2021 that describes amendments to the CSSI.
BDAR	Biodiversity Development Assessment Report, Technical Paper 9 in the EIS (2022)
CoA	Parramatta Light Rail Stage 2 Conditions of Approval (SSI 10035)
DPIRD	Department of Primary Industries and Regional Development (formerly DPI)
EIS	Environmental Impact Statement for Parramatta Light Rail Stage 2 (2022)
EPBC Act	Commonwealth Environmental Protection and Biodiversity Conservation Act 1999
FM Act	Fisheries Management Act 1994
KFH	Key Fish Habitat
KFH Offset Strategy	Key Fish Habitat Offset Strategy (this document)
MHL	Manly Hydraulics Laboratory
NNR	Newington Nature Reserve
NPWS	National Parks and Wildlife Service
PCT	Plant Community Type
Planning Approval	Collective term for the Parramatta Light Rail Stage 2 Environmental Impact Statement, Response to Submissions, Amendment Report and Conditions of Approval
PLR2	Parramatta Light Rail Stage 2, also known as 'the project'
SEARs	Secretary's Environmental Assessment Requirements
SOPA	Sydney Olympic Park Authority
TfNSW	Transport for New South Wales
Updated BDAR	Updated Biodiversity Development Assessment Report, Amendment Report (2023)

Related policy and supporting documents

- TfNSW Biodiversity Policy (August 2022).
- TfNSW Biodiversity assessment guidelines (2022).
- TfNSW No net loss guidelines (2024).
- TfNSW Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (2024)

Summary

Parramatta Light Rail Stage 2 (PLR2) will connect the Parramatta CBD and the first stage of Parramatta Light Rail to Camellia, Rydalmere, Ermington, Melrose Park, Wentworth Point, Sydney Olympic Park, and the Carter Street precinct in Lidcombe, adjacent to Sydney Olympic Park. Most of PLR2 is located in the City of Parramatta local government area (LGA). A small section is located in the City of Ryde LGA. The project is located on the land of the Burramattagal and the Wangal and the Wategora clans of the Dharug nation. The project involves construction of two new bridges over the Parramatta River, between Camellia and Rydalmere and between Melrose Park and Wentworth Point.

The need for marine biodiversity offsets to compensate marine vegetation impacted by the works was identified during the environmental assessment process. The offset process requires the development of a Key Fish Habitat (KFH) Offset Strategy (this document), in consultation with the Department of Primary Industries and Regional Development (DPIRD) Fisheries, Sydney Olympic Park Authority (SOPA) and National Parks and Wildlife Service (NPWS).

Project overview

The project comprises new light rail infrastructure in Macquarie Street, Parramatta and between Camellia and the Carter Street precinct adjacent to Sydney Olympic Park, located mainly within existing road reserves and transport corridors. New active transport links would be provided between Camellia and the Carter Street precinct. The project also comprises operation of a new light rail alignment between the Parramatta CBD and the Carter Street precinct. Part of that alignment (between the Parramatta CBD and Camellia) would be shared with Parramatta Light Rail Stage 1.

The new light rail alignment would use infrastructure proposed as part of the project, and that constructed as part of Parramatta Light Rail Stage 1 between the Parramatta CBD and Camellia. The new light rail alignment would form part of the Parramatta Light Rail network. The project is critical State significant infrastructure subject and was approved by the NSW Minister for Planning in February 2024.

The first phase of PLR2 will commence with the Enabling Works to deliver the first 1.3km of new light rail alignment, including a new public and active transport bridge over the Parramatta River between Wentworth Point and Melrose Park.

Transport for NSW will begin construction of a new bridge between Melrose Park and Sydney Olympic Park in mid-2025. The Enabling Works will improve access between North and South sides of the Parramatta River, and the surrounding areas, improve sustainable and enable active transport options, and improve traffic flows.

Biodiversity offsets

Possible impacts to marine vegetation were identified in the PLR2 Environmental Impact Statement (EIS) technical paper Biodiversity Development Assessment Report, 2022 (BDAR). Impacts were refined and reduced in the Updated Biodiversity Development Assessment Report, 2023 (Updated BDAR) prepared for the Amendment Report, which identified that a temporary working platform would be built to aid construction of bridge piers on the northern and southern sides of the Parramatta River. Across the entire PLR2 project, approximately 0.75 ha of marine vegetation is expected to be impacted by the project and the following marine vegetation has been identified:

- Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion (PCT 902), which is protected marine vegetation under the FM Act

- Coastal saltmarsh in the New South Wales North Coast (PCT 1126), Sydney Basin and South East Corner Bioregions listed as an endangered ecological community (EEC) under the NSW Biodiversity Conservation Act 2016 (BC Act). This is also commensurate with Subtropical and Temperate Coastal Saltmarsh vulnerable ecological community listed under the EPBC Act and is protected marine vegetation under the FM Act.

These Plant Community Type (PCT) are considered KFH and harm to marine vegetation to be offset in accordance with the *Policy and guidelines for fish habitat conservation and management* (2013) to ensure there is no net loss of KFH. Under this policy, impacts to KFH compensated at a ratio of 2:1 offset. DPIRD Fisheries has expressed a preference for rehabilitation projects instead of direct monetary compensation as the method to fulfil the project offset requirements in the permits, which aligns with the *Parramatta Light Rail Stage 2 Conditions of Approval (SSI 10035)* (CoA) requirements (refer below to 'offset project selection').

In accordance with CoA E6 and Condition E7, TfNSW has developed this KFH Offset Strategy to address and identify compensatory measures to offset the projects biodiversity impacts in conjunction with SOPA, NPWS and DPIRD Fisheries at a local level.

Consultation

In accordance with CoA E7 the KFH Offset Strategy (this document) must be prepared in consultation with DPIRD Fisheries, SOPA and NPWS. Consultation with DPIRD Fisheries, SOPA and NPWS to discuss the offset options continued through 2023 and 2024,. Discussions to identify preferred culvert options for the Flushing Channel 1 was undertaken in a meeting held on 5 November 2024. SOPA suggested the reintroduction of tidal flow into Newington Nature Reserve Wetlands, which is identified as Priority 1 project in this document. Further detail can be found in Section 4.

Offset project selection

CoA E6 and E7 require the KFH Offset Strategy must "preference on-ground offsetting within Parramatta River estuaries where practicable (i.e. Newington Nature Reserve and Badu Mangroves in Bicentennial Park)."

Manly Hydraulics Laboratory (MHL) were engaged by TfNSW in February 2024 to undertake hydraulic investigations of the Newington Nature Reserve wetlands across several sites to identify solutions to reinstate tidal flow back to the wetlands. MHL considered opportunities to rehabilitate degraded mangrove and saltmarsh communities within the nature reserve by improving hydrological functioning.

Following discussions with stakeholders, preliminary prioritisation of KFH offset opportunities identified priority options:

- **Priority 1** –undertake on-ground offset project to reintroduce efficient tidal flow into Newington Nature Reserve Wetlands. This site (Flushing Channel 1) is NPWS land, managed by SOPA who maintain assets within the Newington Nature Reserve wetlands.
- **Priority 2** – Priority 1 plus input (funding) from key stakeholders to expand the scale of the offset.

Additional options and detail on the priority options is provided in Section 2.2.

1 Introduction

1.1 Project background

The Parramatta Light Rail is one of the NSW Government's latest major infrastructure projects being delivered to serve a growing Sydney. Stage 2 of the Parramatta Light Rail will connect Stage 1 and Parramatta's CBD to Sydney Olympic Park via Camellia, Rydalmere, Ermington, Melrose Park and Wentworth Point. It will connect the local communities in the Greater Parramatta and Olympic Peninsula and bring the vision of a '30-minute city' closer to reality.

PLR2 will be delivered in two phases, Enabling Works and Main Works. The first phase of PLR2 will commence with the Enabling Works to deliver the first 1.3km of new light rail alignment, including a new public and active transport bridge over the Parramatta River.

The PLR2 Enabling Works bridge between Wentworth Point and Melrose Park will be the first significant crossing over Parramatta River since the Ryde Bridge was completed in 1987. The bridge will provide a much-needed connection for the growing communities north and south of the river, thus unlocking the Sydney Olympic Park peninsula and its world class sporting, recreational and economic facilities.

The bridge will require a 320-metre span over a bend in the Parramatta River to minimise impact to environmentally sensitive mangroves and provide underpass access for road and active transport to established recreational facilities. Enabling Works will include approaches on either side of the river, with the approaches and bridge totalling 1.3 kilometres. The northern approach from Melrose Park spans the Parramatta Valley cycleway and maintains access to Ermington Boat Ramp. The southern approach will land west of Sekisui House's Sanctuary development before turning east towards Hill Road.

PLR2 is shown below on Figure 1-1.

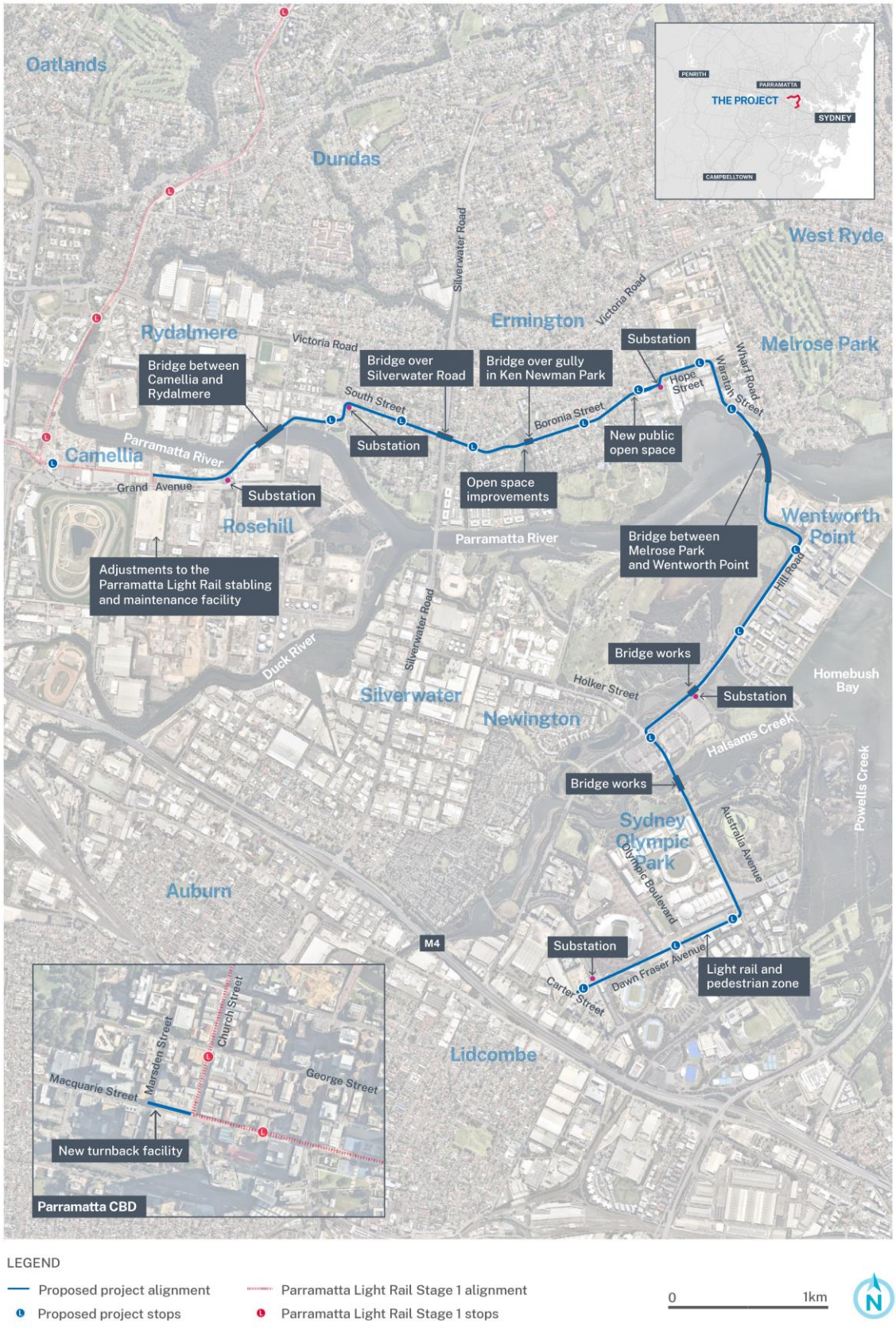

Figure 1-1: PLR2 alignment

1.2 Legislation, policies and guidelines

There are two main pieces of legislation that protect marine biodiversity at a State and Commonwealth level. The two pieces of legislation that are relevant to the KFH Offset Strategy are:

- FM Act makes it an offence to harm estuarine macrophytes, such as mangroves and saltmarsh, fisheries, threatened species, and resources without an appropriate assessment, inclusion of safeguards, and/or the appropriate permissions to carry out certain work. The objects of the FM Act are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. It lists threatened species, populations, and ecological communities, 'Key Threatening Processes', and the requirements or otherwise for the preparation of a Species Impact Statement.
- EPBC Act 1999 protects matter of national environmental significance (MNES) and Commonwealth land values. The Act requires project actions to be controlled under the Act's provisions if they are likely to have a significant impact. The bilateral agreement between the NSW and Australian Governments (Section 1.1) also covers offset agreements. Regarding the Project, the bilateral agreement states that offsets will be completed in accordance with the objective of the EPBC Act and in conjunction with the following policies:
    - the Policy and Guidelines for Fish Habitat Conservation and Management (DPI, 2013, the 'DPI Fisheries Policy') which provides guidance on addressing and offsetting aquatic impacts;
    - the NSW Biodiversity Offset Policy for Major Projects Fact Sheet: Aquatic biodiversity (DPE, 2014)
    - EPBC Act Environmental Offsets Policy which defines the offsetting requirements under the EPBC Act.

The DPIRD Fisheries policy requires no net loss of KFH meaning, no overall loss of habitat. Where "significant [direct and indirect] environmental impacts [cannot be avoided they] are to be offset by environmental compensation". Environmental compensation (non-monetary) is defined as "the creation or enhancement of fish habitats or fisheries resources in order to compensate for anticipated adverse or actual environmental effects of proposed developments."

The PLR2 project SEARs provide further refinement of BDAR requirement as noted in the following excerpt, from Key Issue and Desired Performance Outcomes no. 3, below:

Impacts on biodiversity values not covered by the BAM must be assessed. This includes a threatened aquatic species assessment (Part 7A Fisheries Management Act 1994) to address whether there are likely to be any significant impact on listed threatened species, populations or ecological communities listed under the Fisheries Management Act 1994 (FM Act).

Under the DPIRD Fisheries policy impacts to KFH are to be offset to ensure no net loss. DPI (2013) calculates habitat compensation on a minimum 2:1 basis for all KFH lost; a greater compensation ratio may be considered if offsets cannot be sourced in the vicinity of the impact or are not of the same habitat type as that impacted. Where on ground offsets are not possible, or insufficient to compensate for the entire impacted area of KFH, DPIRD Fisheries (December 2021) indicated a rate of $56.75 per square metre (subject to annual inflation), was appropriate for monetary offsetting of the residual; the rate is consistent with aquatic ecosystem services rates calculated by Costanza et al. (1997, cited in DPI 2013). Monetary offsetting is least preferable, and feasibility will be assessed under NSW Government Procurement Policy to determine if the project would proceed.

1.3 Key fish habitat impacts

The PLR2 EIS assessed how the project would impact the area's marine ecology and biodiversity values. The EIS determined that some impacts to marine ecology and biodiversity due to the project could not be fully avoided. The EIS identified the project was likely to result in residual impacts to KFH, including direct and indirect impacts to Threatened Ecological Communities (TEC).

The KFH Offset Strategy provides a strategy for managing and mitigating the impacts on marine biodiversity and ecology identified in the EIS. The KFH Offset Strategy identifies appropriate offset requirements under the EPBC Act and Fisheries Management Act 1994 (FM Act).

The KFH Offset Strategy documents how Transport for NSW would meet its marine offset obligations. It also describes how these actions would be implemented in consultation with stakeholders including NSW DPIRD Fisheries, SOPA, NPWS, Commonwealth Department of Climate Change, Energy, and the Environment and Water (DCCEEW) to achieve a net gain in environmental outcomes for the Newington Nature Reserve as a priority and the Parramatta River more broadly where suitable offset sites are not available withing the direct location.

The following factors associated with the FM Act were assessed through a Biodiversity Development Assessment Report (BDAR):

- Desktop review to determine the threatened species that are predicted to occur within the locality of the project and hen could occur, subject to the habitats present
- Aquatic habitat assessment
- Assessment of potential impacts on threatened species and KFH
- Identification of suitable impact mitigation and environmental management measures for aquatic habitats.

The project would impact the following KFH through:

- Removal of 0.72 ha of mangroves (7,214 sq)
- Removal of 0.03 ha of saltmarsh (265 sq)
- Construction of piers in the Parramatta River
- Shading from constructed bridge.

The following plant community type (PCT) are considered KFH:

- Estuarine mangrove forest (PCT 920)
- Estuarine saltmarsh (PCT1126)

1.4 Conditions of Approval

PLR2 must offset impacts to fish habitat, which is not subject to terrestrial biodiversity offset, for example mangrove and saltmarsh communities. Offsets will be undertaken in accordance with the PLR2 CoA as follows:

Table 1: Conditions of approval relevant to the KFH Offset Strategy

ID	Condition	How addressed
E6	Impacts to Key Fish Habitat (KFH) as defined in the Policy and Guidelines for Fish Habitat Conservation and Management Update 2013 (DPI, 2013) must be avoided where possible. KFH (mangroves and saltmarsh) must be offset at a ratio of 2:1 in accordance with the documents listed in Condition A1. On-ground offsetting within Parramatta River estuary (i.e. Newington Nature Reserve and Badu Mangroves in Bicentennial Park) must be prioritised. Where there are not sufficient on-ground offset opportunities within the Parramatta River estuary, a compensatory payment for the residual offset, at the rate outlined in the documents listed in Condition A1 of this schedule, must be made to the DPI Fish Conservation Trust Fund before the commencement of Work impacting Key Fish Habitat. A receipt confirming payment to the DPI Fish Conservation Trust Fund must be submitted to the Planning Secretary within one (1) month of making the payment.	Impacts on KFH have been reduced through the progression of the project. A reduction of 0.21 ha impact on marine vegetation was achieved through the scope amendments described in the PLR2 Amendment Report, 2023. On-ground offsetting within Parramatta River estuary will be prioritised through the Key Fish Habitat Restoration Project aimed at improving the hydrology of the Newington Nature Wetlands and thus reconnecting the River and Wetland. Refer to Section 2.2. As outlined in Section 2.2, if there are no sufficient on-ground offset opportunities after consulting DPI Fisheries, compensatory payment for the residual offset would be made to DPI Fish Conservation Trust Fund before work impacting KFH commences. If this occurs a receipt confirming payment will be submitted to the Planning Secretary within one month of payment.
E7	A Key Fish Habitat Offset Strategy must be prepared in consultation with DPI Fisheries, SOPA and NPWS and published in accordance with Condition B15 before the commencement of Work impacting Key Fish Habitat. The Strategy must: a) consider relevant policies and guidelines, including but not limited to, the NSW Biodiversity Offsets Policy for Major Projects and Policy and guidelines for Fish Habitat Conservation and Management Update 2013 (DPI, 2013); b) preference on-ground offsetting within Parramatta River estuaries where practicable (i.e. Newington Nature Reserve and Badu Mangroves in	This document has been prepared in consultation with DPI Fisheries, SOPA and NPWS as outlined in Section 4. This document will be published on the PLR2 website prior to work impacting KFH. This document addresses the subsections of E7 as follows: a) NSW Biodiversity Offsets for Major Projects, Policy and guidelines for Fish Habitat Conservation and Management were used to assess and guide the strategy. See Section 1.2.

ID	Condition	How addressed
	Bicentennial Park). Where sufficient offsets cannot be provided in those locations, alternative locations within Parramatta River estuaries may be considered; c) consider, in order of priority: (i) rehabilitate degraded mangrove and saltmarsh communities by improving hydrological functioning; (ii) expanding existing mangrove or saltmarsh patches; and (iii) improving condition of existing mangrove or saltmarsh patches by removing exotic or non-endemic species to allow for natural regeneration of mangrove and saltmarsh species and / or replacing these with mangrove or saltmarsh species; d) identify outcomes to be achieved, including the form and timing for them to be achieved and the likely split between on-ground and other offsets; e) include a program for completion of rehabilitation work identified; and f) include a maintenance and monitoring program which establishes clear actions, timing, success targets, and actions to be undertaken when success is not achieved.	b) on-ground offsetting has been prioritized, with the Newington Nature Reserve being the top preference. See Section 2.1 for additional information on offset options and prioritisation. c) the preferred offset option in Newington Nature Reserve would rehabilitate degraded mangrove and saltmarsh communities by improving hydrological functioning, through tidal flushing. Refer to Section 2. d) Section 2.3 identify outcomes for the Newington Nature reserve rehabilitation project. e) Section 3.2 outlines an envisioned program for the works required of the KFH offset. f) Section 3.1 outlines the KFH offset maintenance and monitoring including timing, performance targets and approaches if KFH offset priority 1 is not achieved.

2 Key fish habitat offset strategy

2.1 Offset options

As required under CoA E6 and E7, Transport for NSW investigated options for on-ground works to offset biodiversity liabilities under the FM Act, investigating offset options in Newington Nature Reserve and the Badu Mangroves in Bicentennial Park or other areas within Parramatta River estuary. After consultation with relevant parties, the Newington Nature Reserve Restoration Project emerged as a suitable option to improve KFH within the impacted area.

Newington Nature Reserve is located on the southern side of the Parramatta River, approximately twelve (12) kilometres (km) west of Sydney, between Homebush Bay and Silverwater. The Reserve is adjacent to PLR2 within Wentworth Point, and is proximate to the areas of KFH impact to be offset. The Newington Nature Reserve is ecologically and physically significant in that it provides a diverse estuarine wetland system with large areas of saltmarsh and mangrove ecosystems representative of pre-European vegetation. Furthermore, the study area provides habitat for approximately seventy (70) species of local and migratory birds, as well as several locally significant saltmarsh vegetation species.

Newington Nature Reserve wetland is a 35-ha wetland in the nature reserve under the NSW National Parks and Wildlife Act. The reserve is within the lands defined as the Millennium Parklands under the NSW Sydney Olympic Park Authority Act 2001. The area is part of the former Royal Australian Navy Armament Depot, Newington and is part of a broader area listed on the NSW State Heritage Register as Item SHR1850 Newington Armament Depot and Nature Reserve, and subject to the NSW Heritage Act 1977. Figure 2-2 below shows the extent of the Reserve.

The Newington Nature Reserve Wetland is highly altered and consists of five sections separated by low mounds marking old vehicular routes or fence lines associated with past use by the Department of Defence. The hydrological regime of the study area has undergone significant change over the past 140 years through constructed flushing channels, adjustable weirs, bunding, stormwater pipes, and drains.

In 2001, Manly Hydraulics Laboratory was commissioned by the Olympic Co-ordination Authority to undertake investigations to gain an understanding of the hydraulic regime in the wetlands. More recently, a wetland condition audit was completed in 2021 with the aim of identifying locations within the study area where hydrological function could be improved to rehabilitate degraded mangrove and saltmarsh communities. Following the wetland condition audit, concept designs of potential remediation options were developed, which include installation of a new culvert through the Parramatta River seawall, excavation of new drainage channels, breaching of internal historical bunds, and clearing of sediment from historic and more recently blocked channels.

Historical works resulted in general improvement in the condition of much of the wetland, though parts remain degraded and poorly drained, and there is evidence of increasing mangrove and saltmarsh dieback over the past few years. Past works only partially addressed historical hydraulic issues; wetland topography is highly variable at the micro-level due to historic use and the 1990s works were very broad-brush – follow-up works are necessary to address remaining drainage issues at a finer scale. Additionally, the 1990s works altered patterns of sediment distribution as the wetland adapted to the new hydrological regime; this has led to siltation of the flushing channels.

An independent condition audit (E2DesignLab 2021) (Figure 2-1) found poor drainage is affecting the ecological health of the wetland, and it is likely to rapidly further decline in condition without intervention. This would result in increased dieback of mangroves and saltmarsh, and expansion of mosquito breeding habitat. This presents an opportunity to undertake works to improve the

functioning hydrology of the wetlands, which in fold will improve community environmental health and social interactions in the area.

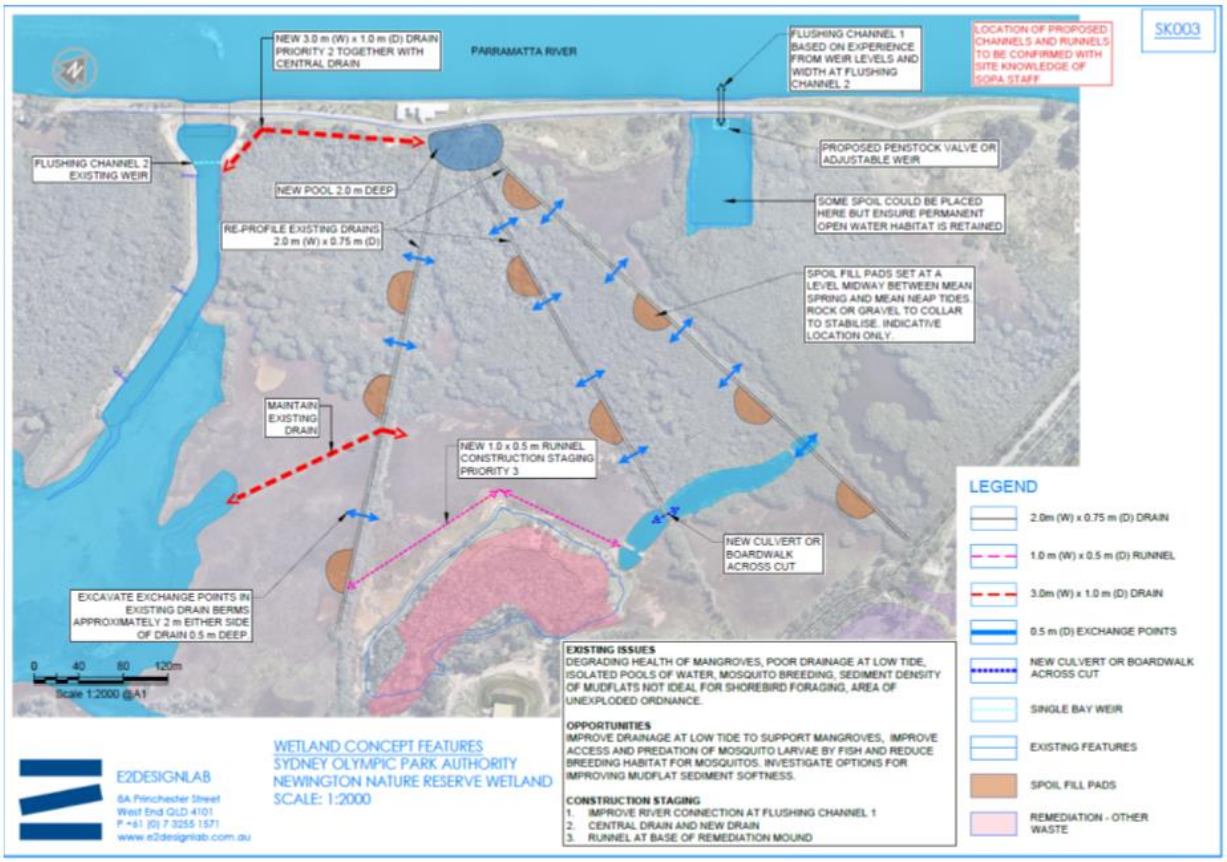

Figure 2-1: Newington Nature Reserve Wetlands concept plan for hydrology improvements (E2DesignLab)

The reserve is managed by Sydney Olympic Park Authority (SOPA) under agreement with the NSW National Parks and Wildlife Service (NPWS). Consultation with DPI Fisheries, SOPA and NPWS will help to establish the best offset option(s).

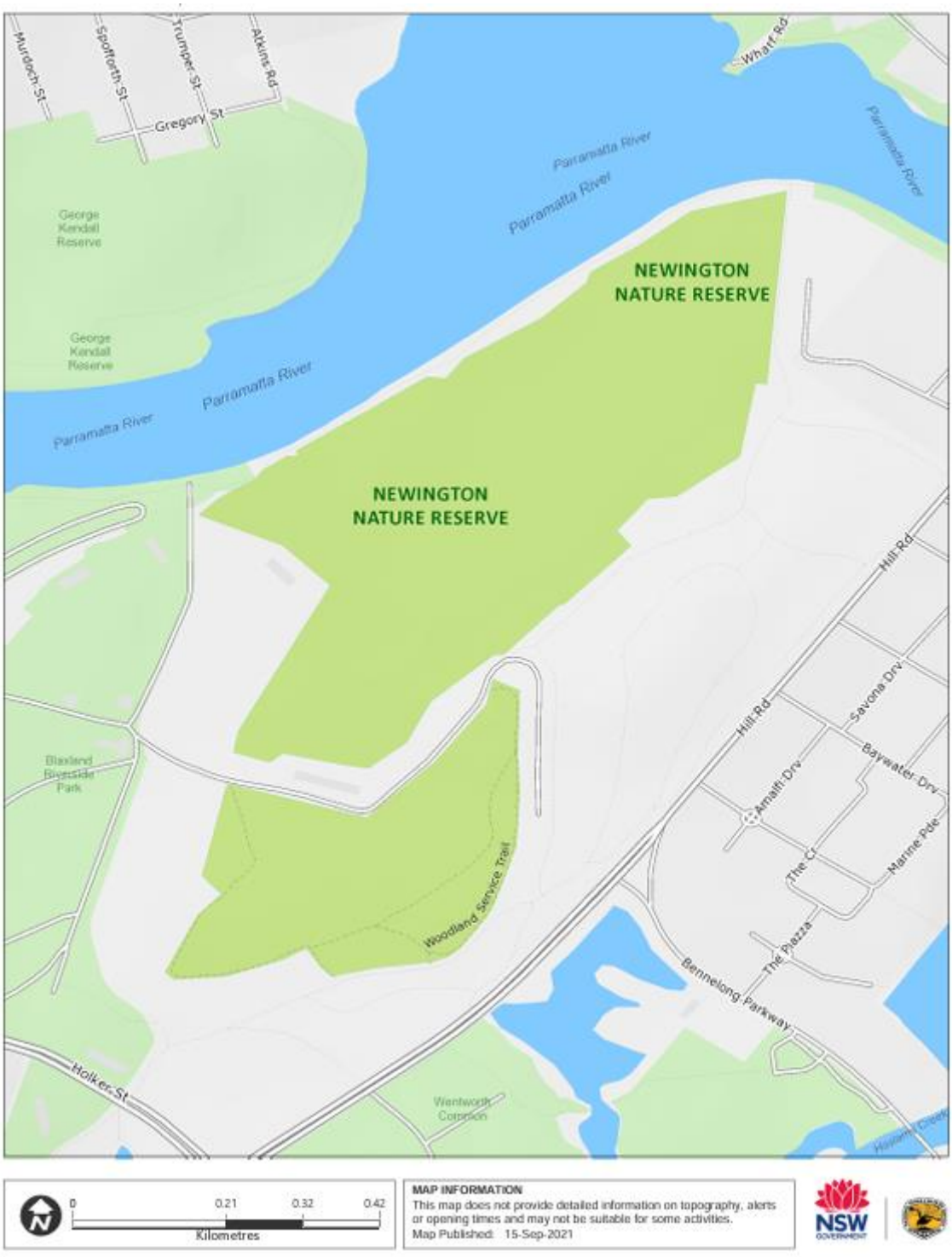

Figure 2-2: Newington Nature Reserve

2.2 Offset prioritisation

A workshop was held with TfNSW, NPWS, SOPA, and DPIRD (Fisheries) on 5 November 2024. At that workshop, an update to the current investigation outcomes was presented by Manly Hydraulics Laboratory, and an approach to prioritisation of potential offset options was agreed as outlined in Figure 2-3.

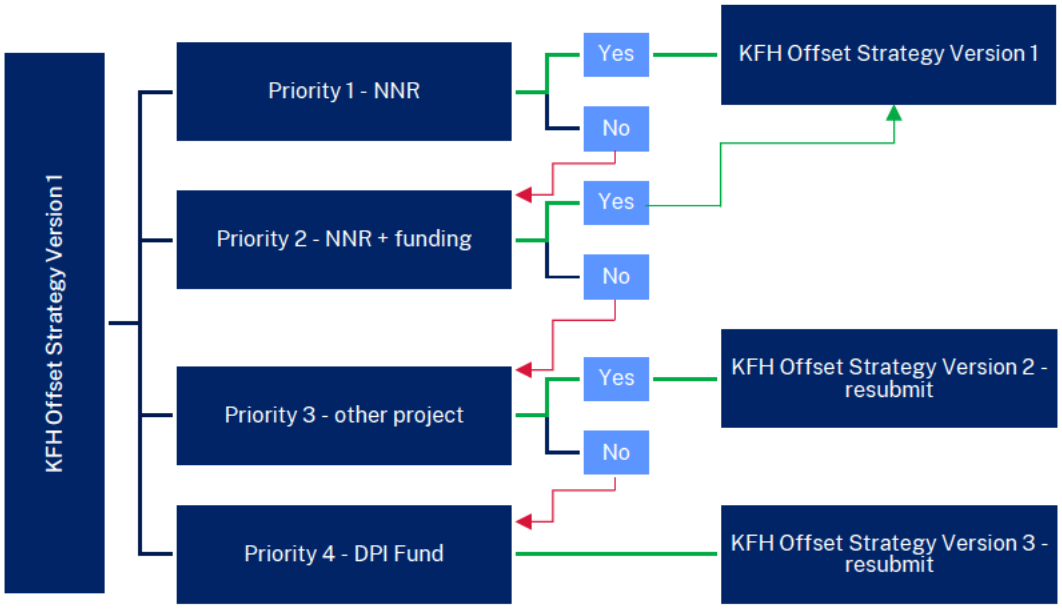

Figure 2-3: KFH Offset Option Priorities Flowchart

The Newington Nature Reserve restoration project is aligned with the priorities of CoA E7, as an on-ground offset within the Parramatta River which would rehabilitate degraded mangrove and saltmarsh communities by improving hydrological functioning. This has been identified as the Priority 1 choice for offset options.

This document (Version 1) is prepared in anticipation of delivering Priority 1 (Newington Nature Reserve restoration project). If the offset requires additional funding, Priority 2 will be considered. If the Priority 1 or Priority 2 project is not feasible, then alternative offset options will be investigated and this document will be revised as follows:

- Consult with DPIRD (Fisheries), SOPA and NPWS in accordance with CoA A12;
- Identify alternative offset options;
- Revise KFH Offset Strategy, including review by DPIRD (Fisheries), SOPA and NPWS;
- Publish revised KFH Offset Strategy in accordance with CoA B15.

2.3 Priority 1 offset project description

Scope of project

The KFH offset project aims to reinstate the tidal flow back into the NNR Wetlands. The work includes the installation of a new culvert through the Parramatta River seawall (in place of an existing silted rock filter wall) to facilitate greater tidal exchange. These works would reverse the current trajectory of declining ecological health and saltmarsh/mangrove die-back, thereby improving the long-term viability of these communities, reducing breeding of pest mosquitoes and improving fish and migratory shorebird habitats.

Manly Hydraulics Laboratory (MHL) were engaged by TfNSW to undertake hydraulic investigations of the Newington Nature Reserve wetlands across several sites to locate the most suitable site to reinstate tidal flow back to the wetlands.

Manly Hydraulics Laboratory undertook preliminary tidal flow analysis and modelled potential management options for the improvement of tidal flow between NNR and the Parramatta River

(Figure 2-4). Seven potential management sub-options were assessed in a calibrated hydraulic model for the identified Flushing Channel. From the seven sub-options, TfNSW and the stake holders will investigate a preferred option.

Site description

The study area is segmented into a series of five sections or sub-areas that are separated by low mounds marking old vehicular routes or fence lines (visual illustration Figure 2-2). Each segment has a slightly different hydrological regime. These segments are:

- **Corner Marsh**: an extensive western area of saltmarsh with the remainder of the area predominantly flanked by mangroves. Prior to remedial work in 1997 (construction of Flushing Channel 1), the site was isolated from tidal flows and contained stagnant water and a bare salt-scalded patch.
- **Wedge Marsh**: an extensive mangrove community, which dominates approximately two thirds of the Wedge Marsh site. The remainder is comprised of saltmarsh, wetland plant communities, and a flushing channel, constructed through this segment in 2000, to link the Corner Marsh and Marsh 33 segments.
- **Marsh 33**: large areas of mangroves, an extensive area of saltmarsh, and an area of casuarinas. Cells for the containment of potential acid sulphate soils were built within this segment in 2000 and formed into a low terrestrial containment mound planted with grasses, casuarinas, and acacias.
- **Main Lagoon**: the largest area of open water in the wetlands. A five-hectare closed Swamp Oak (Allocasuarina glauca) forest has developed since 1955 and fringes the southern side of the lagoon. Extensive areas of saltmarsh on the eastern side of this segment are periodically flooded after heavy rain or after high tides. Tidal flushing of the Main Lagoon occurs twice daily, and the entire Main Lagoon, including the higher ground of the saltmarsh area, is now inundated with saline water.
- **Wharf Marsh**: a brackish pond (Wharf Pond) between the freshwater catchment and intertidal wetlands. Unlike the other lagoons it is primarily a freshwater wetland and receives most of its fresh water via a channel fed by rainwater catchment from mown grassy areas immediately west of the study area. This wetland is a mosaic, including low vegetation, tall reedbeds, open water and shallows. During periods of high but infrequent spring tides, there is an influx of salt water via the Main Lagoon wetland.

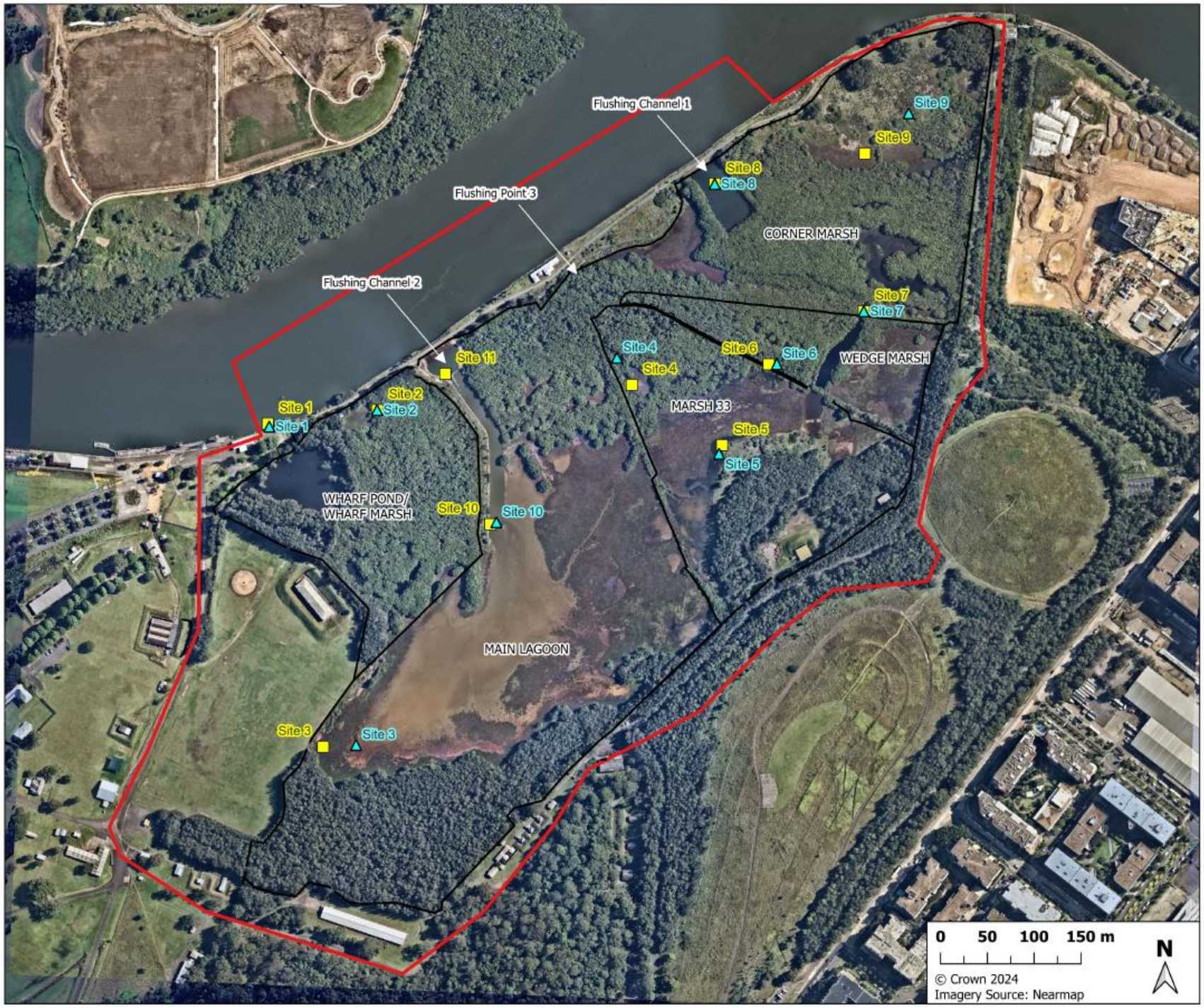

Figure A-1

Study area overview

Legend

- Study area
- Hydrological segments
- 2001 temporary gauge locations
- 2024 temporary gauge locations

Newington Nature Reserve Wetlands

Stage 2 – Data collection and option assessment

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Figure 2-4: Newington Nature Reserve data collection points

Tidal Flushing

Tidal flushing from the Parramatta River within the study area predominately occurs at three locations, as follows:

- **Flushing Channel 1**: constructed in 1997 to introduce tidal flows into the Corner Marsh. Flushing Channel 1 comprises a rock wall filter with reduced capacity for water flow due to sedimentation within the rock wall. Previous site investigations found that water exchange between the study area and the Parramatta River is restricted to a small area of the western side of the rock filter due to sedimentation.
- **Flushing Channel 2**: constructed in the late 1990's and early 2000's to introduce tidal flow to the remainder of the wetland segments. This included removing part of the Parramatta River seawall and replacing it with seven (7) box culverts with invert and soffit levels of approximately -2.1 mAHD and -1.2 mAHD. The open cross-sectional area of the culverts is believed to be about 25 m2. Consequently, there is expected to be negligible head loss in the flow through the culverts if there is no sedimentation. Therefore, the tidal planes in the flushing channel are expected to be effectively the same as those in the Parramatta River, however potential sediment.
- **Flushing Point 3**: a single diameter pipe buried underneath the Parramatta River seawall was installed between Flushing Channel 1 and Flushing Channel 2. Tidal exchange at this location is mostly limited by the size of the pipe itself and potential blockage. The pipe diameter of Flushing Point 3 was identified in the reviewed data as either 600 or 900 mm, while no invert level was available.

Improvements to Flushing Channel 1 were identified as having the greatest opportunities improve tidal exchange within the central/eastern portion of the study area.

2.4 Improvement of biodiversity values

The project will impact KFH associated with the Parramatta River. Piers in the river will comprise instream structures but will not block fish passage noting that in-stream connectivity would be maintained around piers. The PLR2 will impact the following KFH:

- 0.72 hectares of mangroves (7,214 square metres)
- 0.03 hectares of saltmarsh (265 square metres)

Through undertaking the Newington Nature Reserve restoration project as a hydrological project, the offset will improve the hydrological function that has been hindering the sustainability for this niche ecosystem to not only thrive within itself but contribute to preserving the biodiversity values and reconnect with the Parramatta River and surrounding waterway catchments.

Offsetting impacts to the aquatic vegetation through the hydrological restoration project has the potential to reduce and minimise sedimentation of the waterbody and improve water quality, protecting current marine vegetation and KFH populations. Additionally, this project would reconnect improved ecological processes to the Parramatta River ecosystem.

Detailed modelling and sub-option refinement is in progress, alongside consultation with key stakeholders, to inform development of the most effective sub-option. As modelling progresses, relevant specialists will be engaged to forecast the implications of additional tidal inundation, on vegetation health across the study area. This process will confirm the extent of the likely offset benefits.

2.5 Summary of offset project

The Newington Nature Reserve restoration project would involve replacing Flushing Channel 1 to improve tidal exchange.

3 Monitoring and maintenance

3.1 Monitoring program

CoA requires a monitoring program to be established which includes clear actions, timing, success targets, and actions to be undertaken when success is not achieved.

A monitoring program would be developed to monitor impacts to the wetlands from the Newington Nature Reserve restoration project. The monitoring program would be informed by current best practices as provided in, but not limited to:

- *Policy and Guidelines for Fish Habitat Conservation and Management*. (DPI Fisheries, 2013)
- *Framework for Biodiversity Assessment: NSW Biodiversity Offsets for Major Projects* (OEH, 2014).

The objectives for the KFH monitoring outlined here are framed around the impacts of Flushing Channel 1 replacement.

Methodology

The monitoring program would utilise available baseline and historical data, and a baseline on-ground survey prior to construction of Flushing Channel 1 replacement. Noting that an ecologist would be engaged to develop a detailed monitoring program, the following details are an outline of expected criteria for the monitoring program.

The monitoring methodology would include:

- Remote sensing and satellite data
- Mangrove and saltmarsh patch density
- Habitat changes – extent, diversity (of saltmarsh), condition
- Water quality survey/ sampling
- Inundation frequency and levels of target habitat
- SOPA annual Spring bird census data

Timing

Monitoring would be undertaken on the following timeline:

- Baseline survey prior to the offset project construction
- Every six months for 3 years
- Once at 5 years.

Monitoring may be undertaken as part of the biodiversity monitoring program for PLR2, or as an independent monitoring program.

Success targets

Success targets by the monitoring program will be measured against anticipated KFH impacts of the PLR2:

- 0.72 hectares of mangroves (7,214 square metres)
- 0.03 hectares of saltmarsh (265 square metres).

Improvements to hydrological functioning of the wetlands would aim to:

- rehabilitate degraded mangrove and saltmarsh communities;
    - improved mangrove integrity and connectivity of forest
    - increase in diversity and abundance of native fish and fauna species
- expand existing mangrove or saltmarsh patches' health;
    - increased recruitment of mangrove and saltmarsh species in current and new locations
    - Tidal inundation is reaching new and appropriate areas.

The target is to rehabilitate and/or expand mangrove and saltmarsh over a 2:1 offset area compared with the PLR2 impacts. That is:

- 14,428 square metres of mangroves
- 530 square metres of saltmarsh.

Addition to the above targets its suggested to include control areas to measure against current healthy mangrove, saltmarsh vegetation, which SOPA already have established including past data.

Consistent monitoring is required to demonstrate compliance with offsetting requirements and will be detailed in the monitoring program developed by an ecologist. Monitoring reports will be prepared within one month of the completion of each monitoring activity and progress will be considered against the target in each monitoring report. TfNSW will provide monitoring reports to DPIRD Fisheries, SOPA and NPWS during the monitoring program.

Additional actions

In order to see a successful mangrove habitat post restoration works a minimum period of 12 months (including monthly monitoring) would be a justifiably revision of the success of the KFH offset. Noting there may be multiple limitation that may hinder initial uptake of the restoration in the location, such as abiotic factors.

If the Newington Nature Reserve restoration project falls short of the success target identified, then the following actions will be taken:

- Consider further improvements to the maintenance program on Flushing Channel 1
- Consider adaptive management of the tidal gate settings
- Consider payment into the DPIRD Fisheries Fund to cover the gap between the success target and the offsets achieved.

If the above additional actions are required, this would be undertaken in consultation with DPIRD (Fisheries), SOPA and NPWS.

3.2 Maintenance program

The Newington Nature Reserve is on NPWS land, with SOPA undertaking maintenance across the Sydney Olympic Park area and within the Reserve.

TfNSW propose to work with NPWS and SOPA to determine an appropriate maintenance program to ensure that the upgraded Flushing Channel 1 operates effectively.

4 Consultation

This document has been prepared in consultation with DPI (Fisheries), SOPA and NPWS in accordance with CoA E7. A detailed consultation report, including matters raised by stakeholders and TfNSW responses, has been prepared in accordance with CoA A12 (Appendix A – Consultation ReportAppendix A – Consultation Report).

4.1 Consultation with DPIRD (Fisheries)

Consultation with DPIRD (Fisheries) was carried out in 2023 and 2024. This included Microsoft Teams meetings held on 3 August 2023 and 5 November 2024 to discuss offset requirements and identifying potential sites for rehabilitation works. The draft KFH Strategy was sent out for comment on 5 December 2024 with comments received on 20 December 2024.

4.2 Consultation with SOPA

Consultation with SOPA was carried out in 2023 and 2024. This included Microsoft Teams meetings held on 16 June 2023, 14 March 2024, 21 May 2024, and 5 November 2024 to discuss offset requirements, identifying potential sites for rehabilitation works, and updates of the MHL modelling and findings. The draft KFH Strategy was sent out for comment on 5 December 2024 with comments received on 9 December 2024.

4.3 Consultation with NPWS

Consultation with NPWS was carried out in 2024. This included Microsoft Teams meetings held on 14 March 2024, 21 May 2024, and 5 November 2024 to discuss offset requirements, identifying potential sites for rehabilitation works, and updates of the MHL modelling and findings. The draft KFH Strategy was sent out for comment on 5 December 2024 with a follow up email sent on 19 December. No comments were received back.

4.4 Ongoing consultation

Additional consultation will be undertaken with DPIRD (Fisheries), SOPA and NPWS with investigations to identify the preferred sub-option for the Newington Nature Reserve Wetland project.

During implementation of the offset project, including construction, monitoring and maintenance, there will be ongoing consultation with the three stakeholders.

5 References

Department of Planning, Housing and Infrastructure (DPHI) (2024), *Parramatta Light Rail Stage 2 Conditions of Approval*. Available at: Parramatta Light Rail Stage 2 Conditions of Approval

Department of Primary Industries (DPI) 2013, *Policy and Guidelines for Fish Habitat Conservation and Management*. Available: Policy and guidelines for fish habitat conservation and management (Update 2013) (nsw.gov.au)

Office of Environment and Heritage (OEH) 2014, *Framework for Biodiversity Assessment: NSW Biodiversity Offsets for Major Projects*. Available: NSW Biodiversity Offsets Policy for Major Projects: Framework for Biodiversity Assessment

Transport for NSW (TfNSW) 2024, *No net loss guidelines: A guide for achieving biodiversity offsets and conservation measures.* Available:

Transport for NSW (2024), Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW. Available: https://www.transport.nsw.gov.au/system/files/media/documents/2024/best_practice_biodiversity_guidelines.pdf

Appendix A – Consultation Report

Transport for NSW

Transport for NSW

Parramatta Light Rail Stage 2

Key Fish Habitat Offset Strategy: Consultation Report

January 2025

transport.nsw.gov.au

Table of Contents

Acknowledgement of Country

Transport for NSW would like to acknowledge the Traditional Custodians of the land on which Parramatta Light Rail Stage 2 project is situated, the Burramattagal, the Wangal and the Wategora clans of the Dharug nation.

Transport for NSW pays its respects to Elders past and present and recognises and celebrates the diversity of Aboriginal peoples and their ongoing cultures and connections to the lands and waters of NSW.

1 Introduction

1.1 Purpose

In accordance with CoA E7 the KFH Offset Strategy must be prepared in consultation with DPIRD Fisheries, SOPA and NPWS. Consultation with DPIRD Fisheries, SOPA and NPWS to discuss the offset options and identify preferred culvert options for the Flushing Channel 1 was undertaken in a meeting held on 5 November 2024. SOPA suggested the reintroduction of tidal flow into Newington Nature Reserve Wetlands, which is identified as Priority 1 project in the KFH Strategy.

1.2 Consultation requirements

1.2.1 Ministers Conditions of Approval

The conditions of approval (NSW CoA) of relevance to stakeholder consultation on the Key Fish Habitat Strategy are listed in Table 2.

Table 2 – Conditions of Approval

CoA	Condition
A12	**EVIDENCE OF CONSULTATION** Where the terms of this approval require a document or monitoring program to be prepared, or a review to be undertaken in consultation with relevant parties, evidence of the consultation undertaken must be submitted to the Planning Secretary and **ER** (as relevant) with the corresponding documentation. The evidence must include: a) documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval; b) a log of the dates of engagement or attempted engagement with the identified party c) documentation of the follow-up with the identified party where engagement has not occurred to confirm that they do not wish to engage or have not attempted to engage after repeated invitations; d) outline of the issues raised by the identified party and how they have been addressed; and e) a description of the outstanding issues raised by the identified party and the reasons why they have not been addressed.
E7	A **Key Fish Habitat Offset Strategy** must be prepared in consultation with DPI Fisheries, SOPA and NPWS and published in accordance with **Condition B15** before the commencement of Work impacting Key Fish Habitat. The Strategy must: *a)* consider relevant policies and guidelines, including but not limited to, the *NSW Biodiversity Offsets Policy for Major Projects* and *Policy and guidelines for Fish Habitat Conservation and Management Update 2013* (DPI, 2013); b) preference on-ground offsetting within Parramatta River estuaries where practicable (i.e. Newington Nature Reserve and Badu Mangroves in Bicentennial

CoA	Condition
	Park). Where sufficient offsets cannot be provided in those locations, alternative locations within Parramatta River estuaries may be considered; c) consider, in order of priority: (i) rehabilitate degraded mangrove and saltmarsh communities by improving hydrological functioning; (ii) expanding existing mangrove or saltmarsh patches; and (iii) improving condition of existing mangrove or saltmarsh patches by removing exotic or non-endemic species to allow for natural regeneration of mangrove and saltmarsh species and / or replacing these with mangrove or saltmarsh species; d) identify outcomes to be achieved, including the form and timing for them to be achieved and the likely split between on-ground and other offsets; e) include a program for completion of rehabilitation work identified; and f) include a maintenance and monitoring program which establishes clear actions, timing, success targets, and actions to be undertaken when success is not achieved.

2 Consultation summary

In accordance with the Infrastructure Approval, the Key Fish Habitat Strategy has been prepared in consultation with the identified parties. A summary of the consultation is provided in Table 3. Detailed consultation records are provided in the appendices of this report.

Table 3 – Consultation summary

Stakeholder	Consultation Summary	Status	Reference
Department of Primary Industries and Regional Development (DPIRD)	Issues raised have been adequately addressed in the KFH Strategy; there are no outstanding issues.	Addressed and closed.	Appendix A: DPIRD consultation evidence
Sydney Olympic Park Authority (SOPA)	Issues raised have been adequately addressed in the KFH Strategy; there are no outstanding issues.	Addressed and closed.	Appendix B: SOPA consultation evidence
National Parks and Wildlife Services (NPWS)	There were no comments received from National Parks and Wildlife Services despite repeated requests.	N/A	Appendix C: NPWS consultation evidence

Appendix A: DPIRD consultation evidence

Table 4 – Consultation log

In / Out	Date	Medium	Details of contact
Out	25 July 23	Email	Initial contact regarding offset projects under the FM Act
	3 Aug 23	Teams meeting	Initial meeting regarding to discuss NNR project
Out	3 Aug 23	Email	Providing DPIRD slide pack from presentation
	5 Nov 24	Teams meeting	Meeting to discuss MHL data collection and option assessment and KFH strategy
Out	5 Dec 24	Email	Requesting comments on draft Key Fish Habitat Strategy
Out	19 Dec 24	Email	Follow-up on requesting comments on draft Key Fish Habitat Strategy
In	20 Dec 24	Email	Comments received from DPIRD on draft Key Fish Habitat Strategy

Table 5 - Issues raised by stakeholder

Issues raised	How addressed	Subject document reference
FM Act is 1994 not 1999	Updated.	Glossary
Department of Primary Industries (DPI) Fisheries are now known as Department of Primary Industry and Regional Development (DPIRD) Fisheries	Updated throughout document.	
"FM Act makes it an offence to harm estuarine macrophytes, such as seagrass....." Suggest changing "seagrass" to "mangroves and saltmarsh" given these two habitats are the focus for offsetting rather than seagrass.	Updated with suggested changes.	Section 1.2
It should be noted that the monetary offset rate of $56.75 per square metre is not to be applied to determine the budget for on ground offsets. Suggest rewording of the final paragraph in this section as follows: Under the DPI Fisheries policy impacts to KFH are to be offset to ensure no net loss. DPI (2013) calculates habitat compensation on a minimum 2:1 basis for all KFH lost; a greater compensation ratio may be considered if on ground offsets cannot be sourced in the vicinity of the impact or are not of the same habitat type as that impacted. Where on ground offsets are not possible, or insufficient to compensate for the entire impacted area of KFH, DPIRD Fisheries (December 2021) indicated a rate of $56.75 per square metre (subject to anual inflation) was appropriate for monetary offsetting of the residual; the rate is consistent with aquatic ecosystem services rates calculated by Costanza et al. (1997, cited in DPI 2013). Monetary offsetting is least prefereable and the offsetting rate of $56.75 per square is only to be used	Updated with suggested changes. Note: feasibility will be assessed under NSW Government Procurement Policy to determine if the project would proceed.	Section 1.2

Issues raised	How addressed	Subject document reference
for monetary offsetting payments and is not to be used to determine a budget for on ground offsets.		
DPIRD Fisheries are not clear why Priority 2 would be activated. TfNSW should be funding the entirety of on ground works to the extent that is covers the 2:1 requirement of the CoAs - ie. 1.5Ha of KFH is rehabilitated.	Total wetland area covers ~35 ha. Area. The intention behind Priority 2 is to seek additional funding to enable the restoration of a larger wetland area beyond the 1.5 ha offset requirement. This would provide greater environmental benefits and allow for more comprehensive habitat rehabilitation. TfNSW are interested in partnerships with Fisheries or other projects in the Parramatta River Catchment to deliver the improved environmental outcomes.	Section 2.2
Including photos / figures in this section would be helpful	Updated with Figures 2-1 & 2-4	Section 2.3
Suggest detailed monitoring program to be developed by ecologist and included as an appendix to the Offset Strategy. "Mangrove patch density": suggest change to "Mangrove and saltmarsh patch density" "Habitat changes": suggest change to "Habitat changes - extent, diversity (of saltmarsh), condition" Suggest adding in "Inundation frequency and levels of target habitat"	Updated with suggested changes.	Section 3.1
Suggest that the monitoring plan specifically identifies the target areas to be rehabilitated/expanded as well as some control areas (where the habitat is already good) that can be used to refer to as a benchmark	Updated to include additional detail.	Section 3.1
We suggest that this section is refined to include the indicators that will be used to determine if the works are approaching/reaching the targets. We suggest that there is a clearer statement around targets that does not simply say that the target is to rehabilitate xxm2 of mangrove and xxm2 saltmarsh (as per current text). We suggest that success measures/indicators reflect what is being monitored in relation to a target. eg.: • Mangrove/saltmarsh density, diversity & condition - indicators in the target area improve significantly from the baseline and	Success targets updated with suggested changes.	Section 3.1

Issues raised	How addressed	Subject document reference
approach or reach benchmark levels as measured in control areas. • Mangrove/saltmarsh extent -areas of habitat in the target area expand from the baseline • Inundation -there should be some target frequencies and maybe tidal mark for inundation • Fish/fauna-indicators improve significantly from the baseline and approach or reach benchmark levels as measured in control areas		
Include a timeframe for when these additional actions will be taken. E.g. Is it after the intensive monitoring period of 3 years or after the 5 year monitoring or if many indicators are showing no change? Suggest these options are investigated after every year of the program and implemented if required.	Updated to include additional detail.	Section 3.1

TfNSW - PLR2 - Newington Nature Reserve

[redacted]

Reply | Reply All | Forward | ...

Tue 25/07/2023 3:49 PM

Hi [redacted],

I've recently come onto the Parramatta Light Rail Stage 2 project and was given your contact details. I just wanted to introduce myself and where we are up to regarding investigating the Newington Nature Reserve tidal flushing project for the FM Act offset credit requirement.

We have completed an early cost estimation based on a staged version of the original proof of concept.

It would be great if we have a quick meeting this week or next to discuss the next steps, limits, and just a general update. Let me know what days work best and I can put something in the calendar.

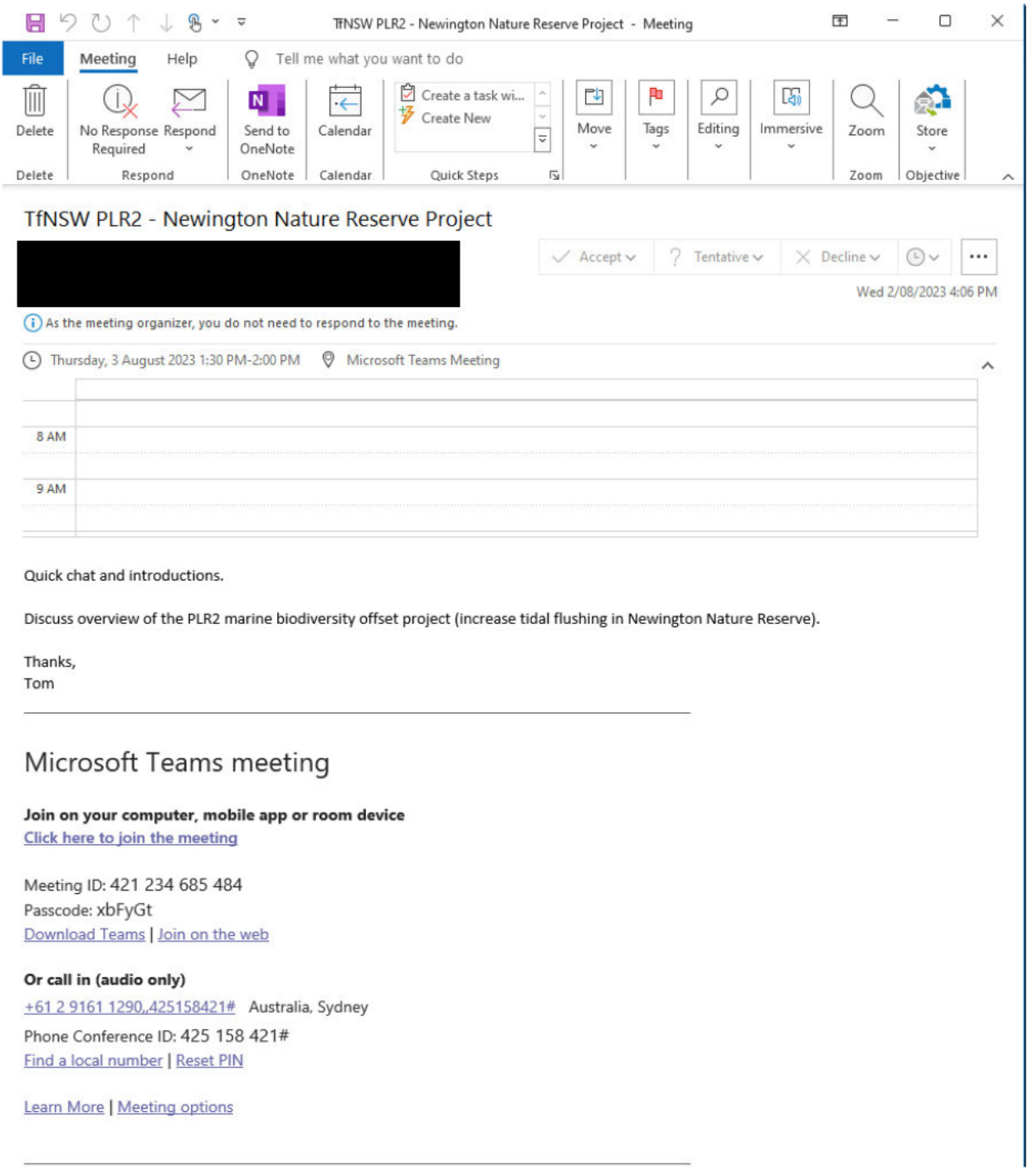
Thanks,

[redacted]
Environmental and Sustainability Manager
Parramatta Light Rail Stage 2
Transport for NSW

[redacted]
Level 8, 4 Parramatta Square
12 Darcy Street
Parramatta NSW 2150

NSW GOVERNMENT
Transport
for NSW

I acknowledge the Aboriginal people of the country on which I work, their traditions, culture and a shared history and identity. I also pay my respects to Elders past and present and recognise the continued connection to country.


TfNSW PLR2 - Newington Nature Reserve Project - Meeting
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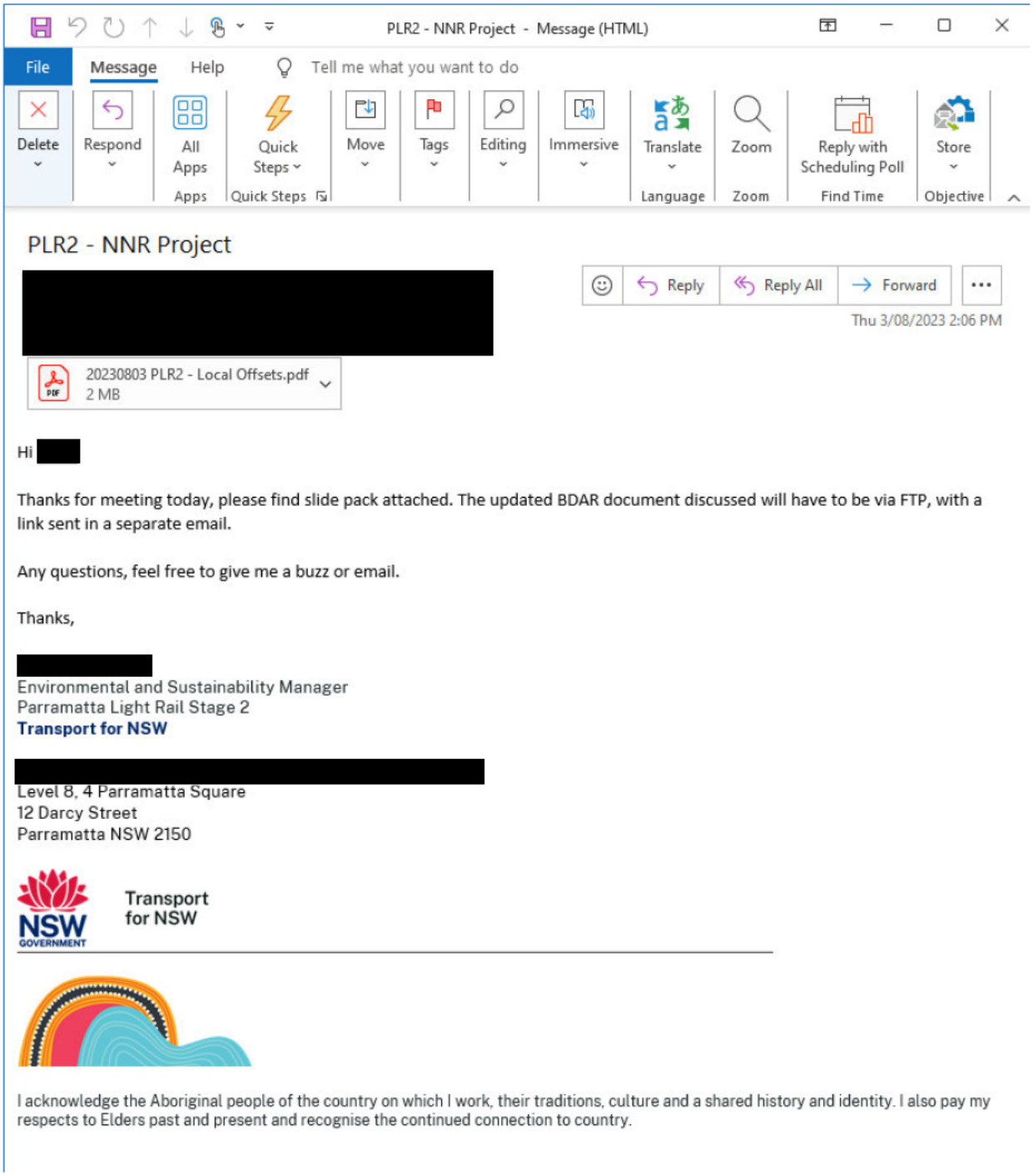
TfNSW PLR2 - Newington Nature Reserve Project
[redacted]
Accept
Tentative
Decline
Wed 2/08/2023 4:06 PM
As the meeting organizer, you do not need to respond to the meeting.
Thursday, 3 August 2023 1:30 PM-2:00 PM
Microsoft Teams Meeting
8 AM
9 AM
Quick chat and introductions.
Discuss overview of the PLR2 marine biodiversity offset project (increase tidal flushing in Newington Nature Reserve).
Thanks,
Tom
Microsoft Teams meeting
Join on your computer, mobile app or room device
Click here to join the meeting
Meeting ID: 421 234 685 484
Passcode: xbFyGt
Download Teams | Join on the web
Or call in (audio only)
+61 2 9161 1290,,425158421# Australia, Sydney
Phone Conference ID: 425 158 421#
Find a local number | Reset PIN
Learn More | Meeting options


PLR2 - NNR Project - Message (HTML)
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Translate
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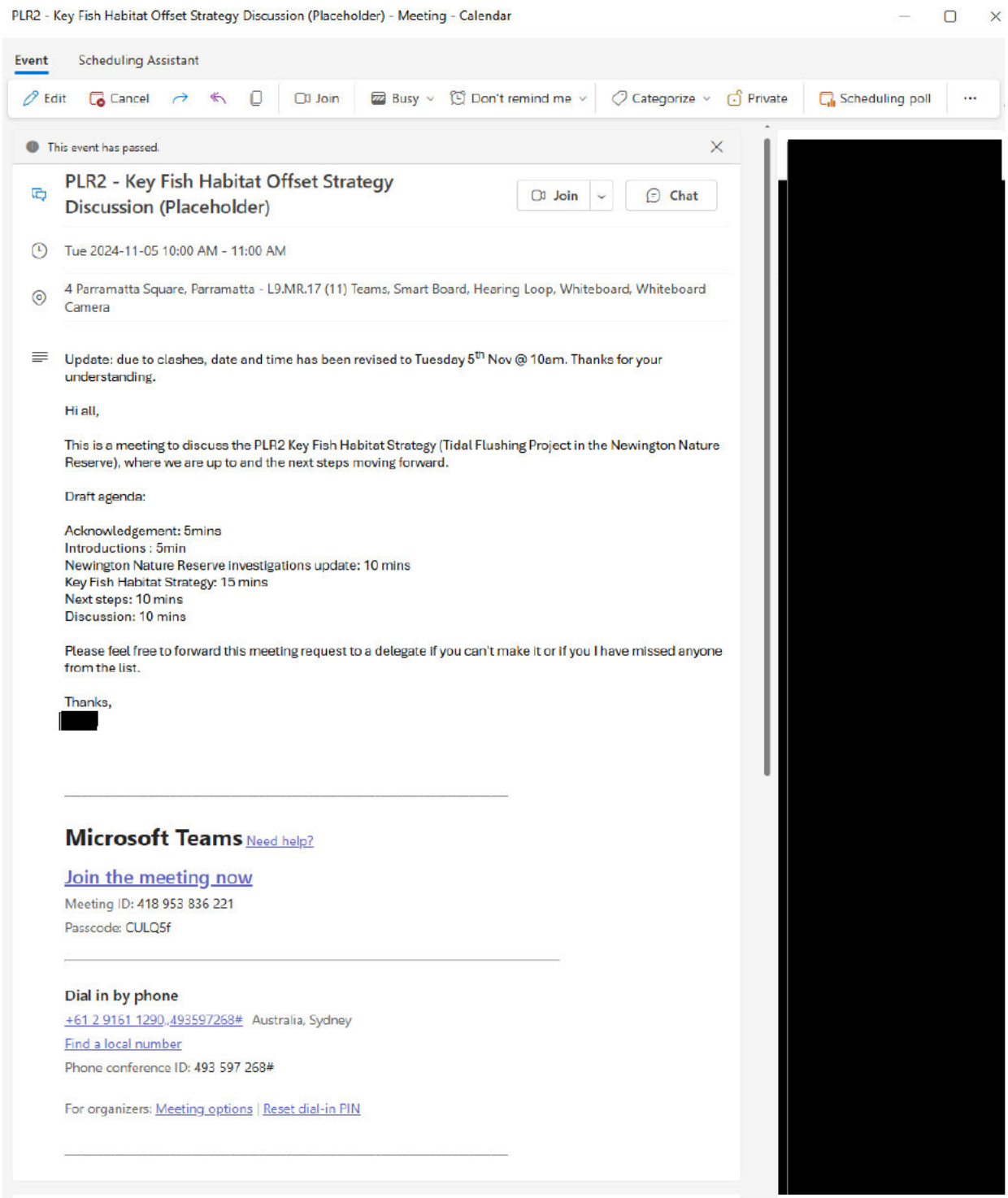
Store
Apps
Quick Steps
Language
Zoom
Find Time
Objective
PLR2 - NNR Project
[redacted]
Reply
Reply All
Forward
Thu 3/08/2023 2:06 PM
20230803 PLR2 - Local Offsets.pdf
2 MB
Hi [redacted]
Thanks for meeting today, please find slide pack attached. The updated BDAR document discussed will have to be via FTP, with a link sent in a separate email.
Any questions, feel free to give me a buzz or email.
Thanks,
[redacted]
Environmental and Sustainability Manager
Parramatta Light Rail Stage 2
Transport for NSW
[redacted]
Level 8, 4 Parramatta Square
12 Darcy Street
Parramatta NSW 2150
NSW GOVERNMENT
Transport
for NSW
I acknowledge the Aboriginal people of the country on which I work, their traditions, culture and a shared history and identity. I also pay my respects to Elders past and present and recognise the continued connection to country.



PLR2 - Key Fish Habitat Offset Strategy Discussion (Placeholder) - Meeting - Calendar

Event Scheduling Assistant

Edit Cancel Join Busy Don't remind me Categorize Private Scheduling poll

This event has passed.

PLR2 - Key Fish Habitat Offset Strategy Discussion (Placeholder)

Join Chat

Tue 2024-11-05 10:00 AM - 11:00 AM

4 Parramatta Square, Parramatta - L9.MR.17 (11) Teams, Smart Board, Hearing Loop, Whiteboard, Whiteboard Camera

Update: due to clashes, date and time has been revised to Tuesday 5th Nov @ 10am. Thanks for your understanding.

Hi all,

This is a meeting to discuss the PLR2 Key Fish Habitat Strategy (Tidal Flushing Project in the Newington Nature Reserve), where we are up to and the next steps moving forward.

Draft agenda:

Acknowledgement: 5mins
Introductions : 5min
Newington Nature Reserve investigations update: 10 mins
Key Fish Habitat Strategy: 15 mins
Next steps: 10 mins
Discussion: 10 mins

Please feel free to forward this meeting request to a delegate if you can't make it or if you I have missed anyone from the list.

Thanks,
[redacted]

Microsoft Teams Need help?

Join the meeting now

Meeting ID: 418 953 836 221

Passcode: CULQ5f

Dial in by phone

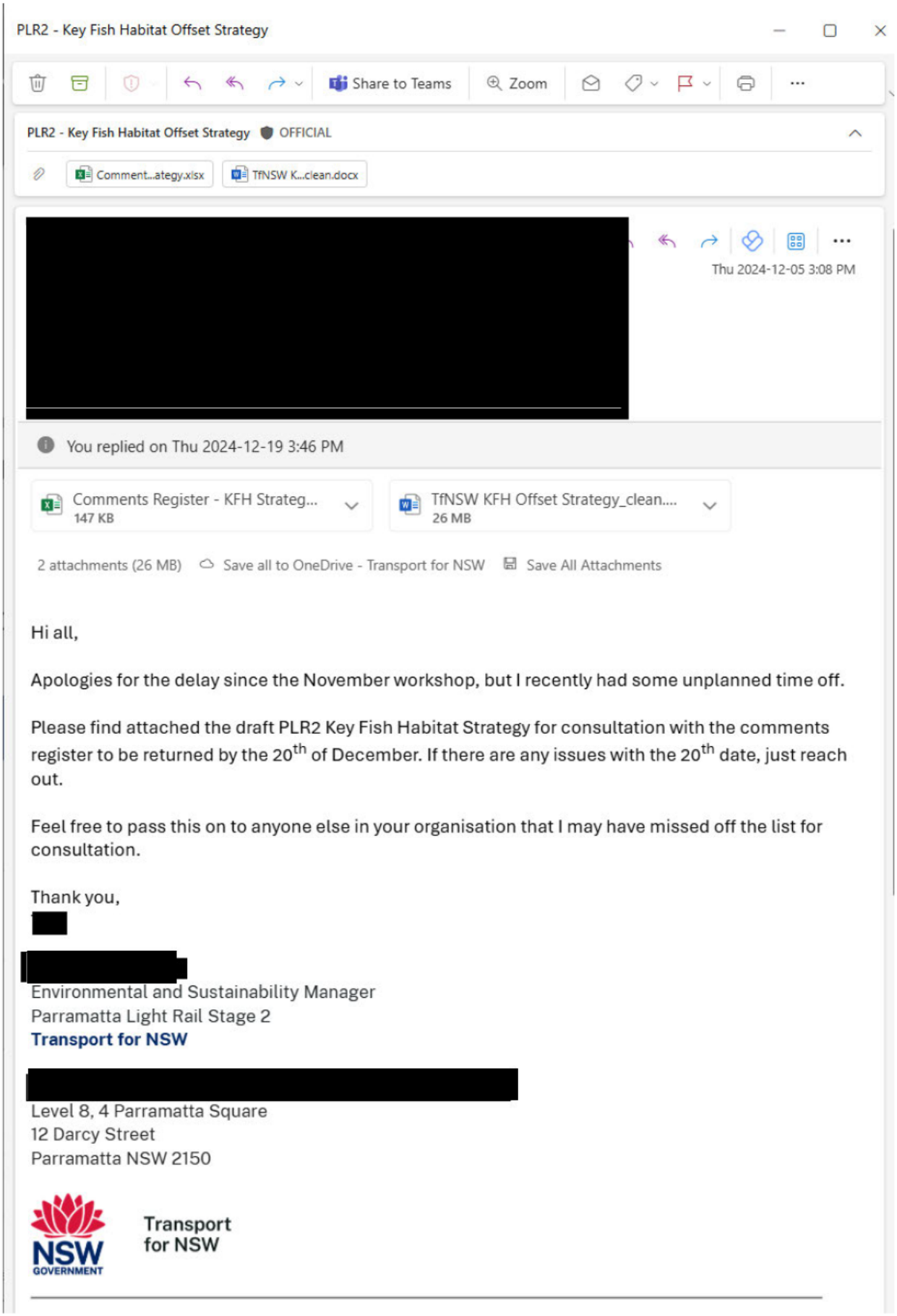
+61 2 9161 1290,,493597268# Australia, Sydney

Find a local number

Phone conference ID: 493 597 268#

For organizers: Meeting options | Reset dial-in PIN

[redacted]


PLR2 - Key Fish Habitat Offset Strategy
Share to Teams
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Comment...ategy.xlsx
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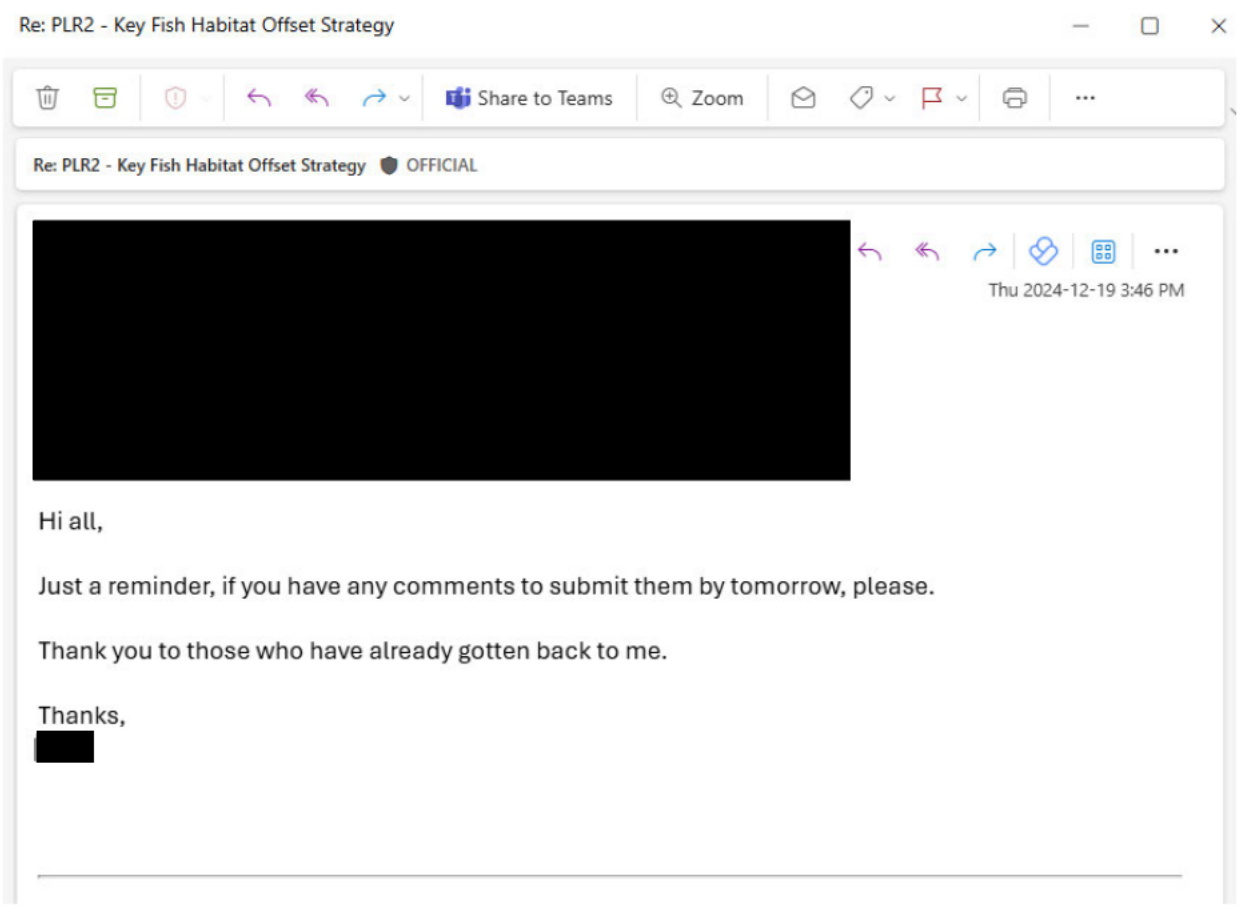
Thu 2024-12-05 3:08 PM
You replied on Thu 2024-12-19 3:46 PM
Comments Register - KFH Strateg...
147 KB
TfNSW KFH Offset Strategy_clean....
26 MB
2 attachments (26 MB)
Save all to OneDrive - Transport for NSW
Save All Attachments
Hi all,
Apologies for the delay since the November workshop, but I recently had some unplanned time off.
Please find attached the draft PLR2 Key Fish Habitat Strategy for consultation with the comments register to be returned by the 20th of December. If there are any issues with the 20th date, just reach out.
Feel free to pass this on to anyone else in your organisation that I may have missed off the list for consultation.
Thank you,
[redacted]
Environmental and Sustainability Manager
Parramatta Light Rail Stage 2
Transport for NSW
[redacted]
Level 8, 4 Parramatta Square
12 Darcy Street
Parramatta NSW 2150
NSW GOVERNMENT
Transport
for NSW


Re: PLR2 - Key Fish Habitat Offset Strategy
Share to Teams
Zoom
Re: PLR2 - Key Fish Habitat Offset Strategy
OFFICIAL
[redacted]
Thu 2024-12-19 3:46 PM
Hi all,
Just a reminder, if you have any comments to submit them by tomorrow, please.
Thank you to those who have already gotten back to me.
Thanks,
[redacted]

Appendix B: SOPA consultation evidence

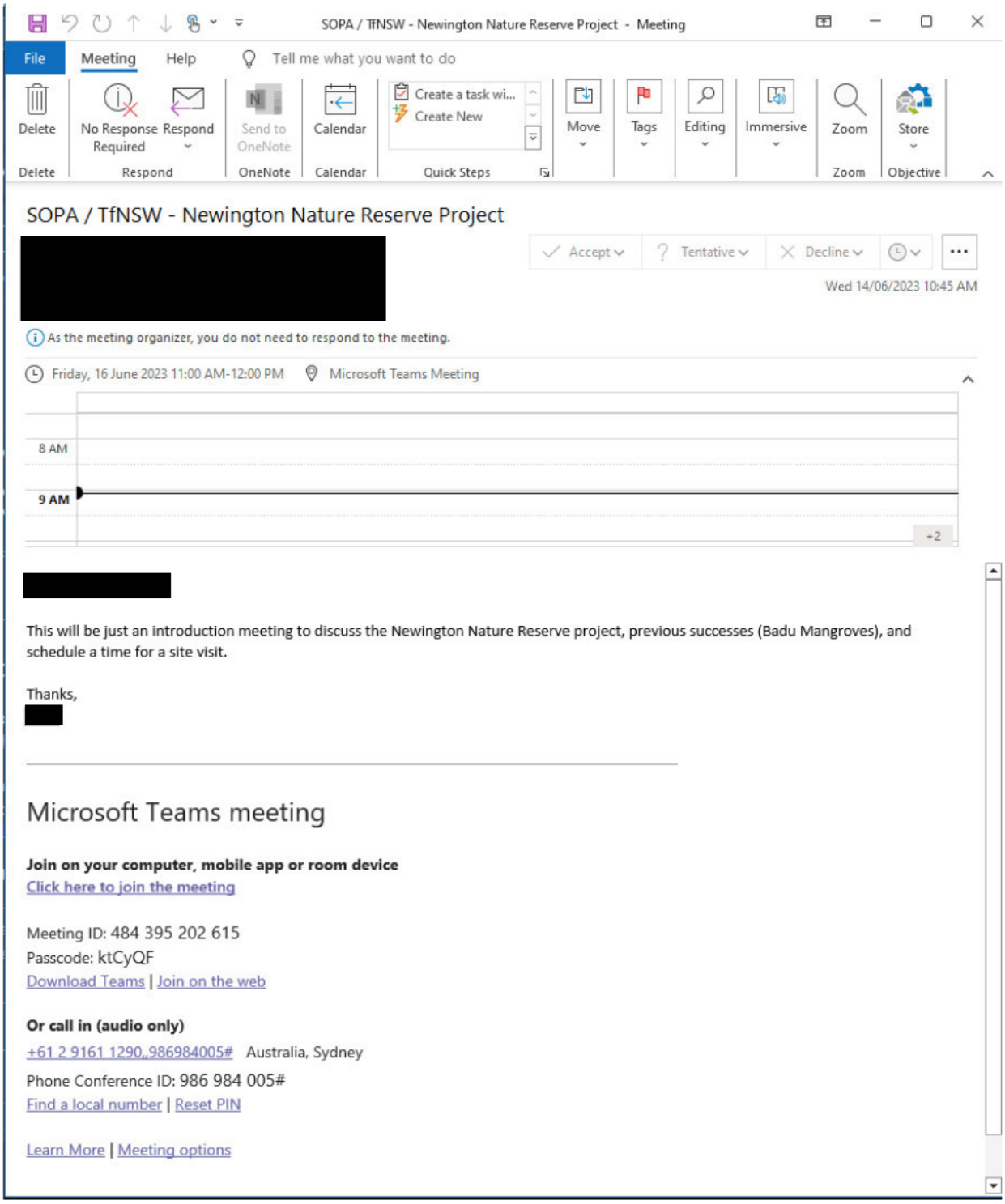
Table 6 – Consultation log

In / Out	Date	Medium	Details of contact
	16 June 23	Teams meeting	TfNSW and SOPA initial discussion about offset projects
	27 June 23	Site tour	TfNSW and SOPA NNR site tour
	14 Mar 24	Teams meeting	Workshop – inception meeting for NNR project
	21 May 24	Teams meeting	Meeting to discuss MHL data collection and option assessment and KFH strategy
	5 Nov 24	Teams meeting	Meeting to discuss MHL preliminary hydraulic modelling and findings
Out	5 Dec 24	Email	Requesting comments on draft Key Fish Habitat Strategy
In	9 Dec 24	Email	Comments received from SOPA on draft Key Fish Habitat Strategy

Table 7 – Issues raised by stakeholder

Issues raised	How addressed	Subject document reference
S2.3 – scope of project – the opening paragraph is broader than the scope that will be achievable with available funds – suggest the stated scope is scaled back to: *installation of a new culvert through the Parramatta River seawall (in place of an existing silted rock filter wall) to facilitate greater tidal exchange. These works would reverse the current trajectory of declining ecological health and saltmarsh/mangrove die-back, thereby improving the long-term viability of these communities, reducing breeding of pest mosquitoes and improving fish and migratory shorebird habitats.* I would also like to see the culvert design include a gate (similar to what we have at the Waterbird Refuge) that would enable us to throttle the flows to achieve the delicate balance between the different ecological communities within the reserve (saltmarsh/mangrove/mudflat/swamp oak floodplain forest), and the seasonal hydrology management considerations (migratory shorebird season, mozzie breeding season). The other items would be great, but they involve works in areas potentially containing unexploded ordnance, which will blow the budget.	Scope updated with suggested changes. Culvert design is subject to the preferred option during detailed design.	Section 2.3
S3.1 monitoring program – ability to deliver the proposed monitoring program would depend on how it was to be funded. Some elements of the program as listed will not generate data useful in demonstrating success or guiding adaptive management of tidal gate settings.	Methodology updated with suggested changes.	Section 3.1

Issues raised	How addressed	Subject document reference
• camera plots, fish and fauna surveys are expensive and won't be useful in demonstrating success due to the variability of fauna movements. SOPA will be continuing our annual Spring Bird Census, which has been running in a standardised format for 21 years and will enable ongoing collection and assessment of bird data that we can make available, though it will be drawing a long bow to use that to judge success. • The most useful monitoring elements to demonstrate success will be monitoring of wetland inundation under different tidal gate scenarios, together with annual air photo assessment of vegetation community distribution, annual data collection from monitoring plots to assess wetland health and condition, and quarterly observational monitoring of health and condition. o We have some established saltmarsh and mangrove monitoring plots (see maps attached) that are used in condition assessments, but would need a few more in the right locations to particularly evaluate change due to the restoration works. Since our staff cuts earlier this year, we no longer have staff to do this monitoring. o We engage a saltmarsh expert to do five-yearly saltmarsh condition assessment and monitoring – next due in about 3 years if we still have budget to do it by then o We also engage an independent expert ecologist to do a walkover and assess condition every two years		
S3.1 success targets – there will likely be some fine-scale changes in relative distribution of saltmarsh/mudflat/mangrove, but we are not anticipating any large change in the relative areas of these communities. Rather the greatest anticipated change will be improved health and long-term viability of these ecosystems. Success targets should not set goals for expanding the area of particular patches of saltmarsh/mangrove, rather for their health (any change in area of one community will be at the expense of another community). The wetland is about 35ha in size, we should be able to calculate the overall area of each community that is expected to have improved ecological health due to the works.	Success targets updated with suggested changes.	Section 3.1
S3.1 – additional actions – there are very few weeds within the wetland, mangrove/saltmarsh/SOFF is generally growing wherever the hydrology suits, so this action will not be available. Adaptive management of the tidal gate settings will be the most practical opportunity we have to address not meeting success targets. Additional rehabilitation works (in UXO areas) would also be an option but budget will be a key consideration.	Additional actions updated with suggested changes.	Section 3.1


SOPA / TfNSW - Newington Nature Reserve Project - Meeting
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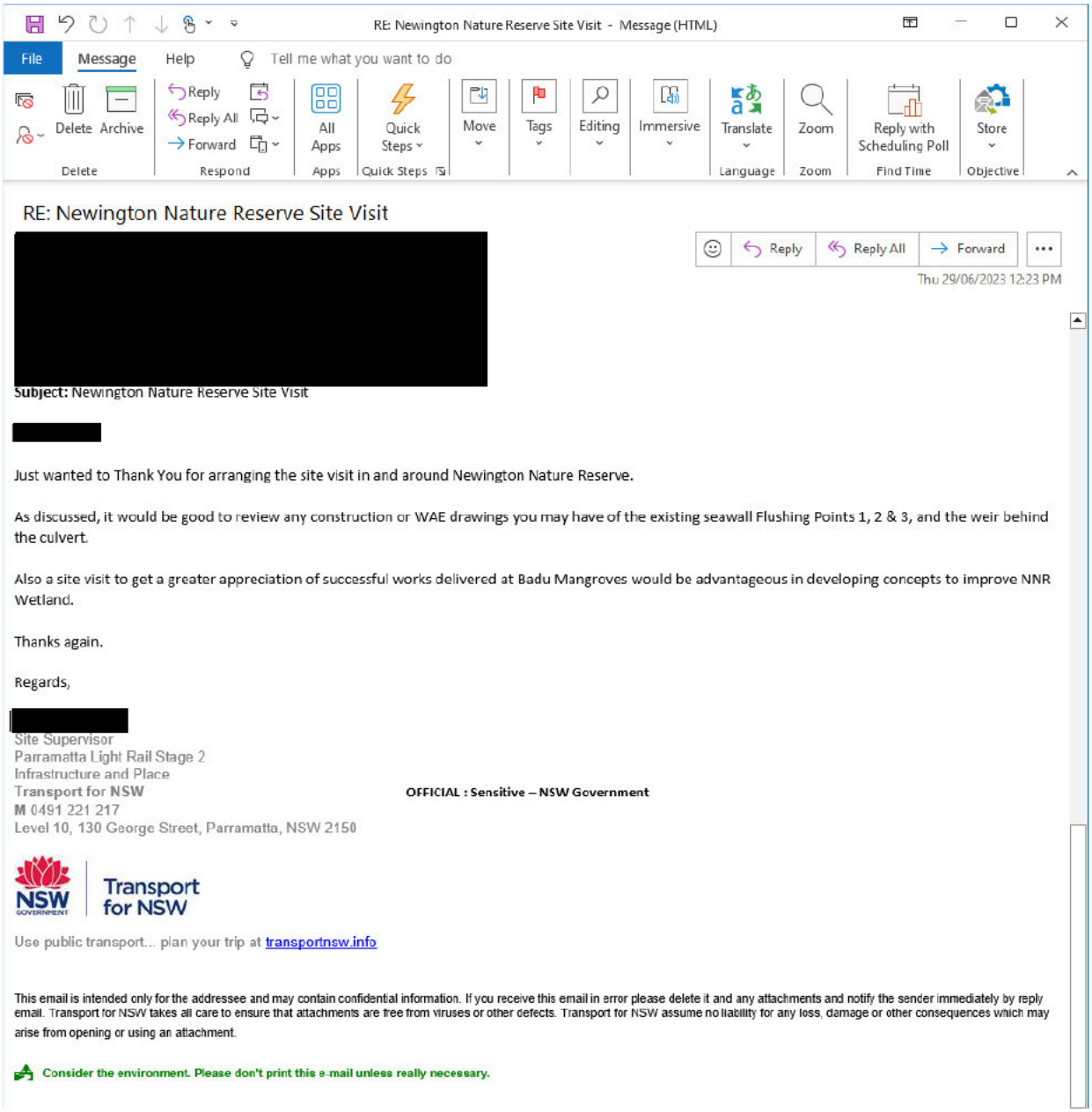
SOPA / TfNSW - Newington Nature Reserve Project
[redacted]
Accept
Tentative
Decline
Wed 14/06/2023 10:45 AM
As the meeting organizer, you do not need to respond to the meeting.
Friday, 16 June 2023 11:00 AM-12:00 PM
Microsoft Teams Meeting
8 AM
9 AM
+2
[redacted]
This will be just an introduction meeting to discuss the Newington Nature Reserve project, previous successes (Badu Mangroves), and schedule a time for a site visit.
Thanks,
[redacted]
Microsoft Teams meeting
Join on your computer, mobile app or room device
Click here to join the meeting
Meeting ID: 484 395 202 615
Passcode: ktCyQF
Download Teams | Join on the web
Or call in (audio only)
+61 2 9161 1290,,986984005# Australia, Sydney
Phone Conference ID: 986 984 005#
Find a local number | Reset PIN
Learn More | Meeting options



RE: Newington Nature Reserve Site Visit - Message (HTML)

File | Message | Help | Tell me what you want to do

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RE: Newington Nature Reserve Site Visit

[redacted]

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Thu 29/06/2023 12:23 PM

Subject: Newington Nature Reserve Site Visit

[redacted]

Just wanted to Thank You for arranging the site visit in and around Newington Nature Reserve.

As discussed, it would be good to review any construction or WAE drawings you may have of the existing seawall Flushing Points 1, 2 & 3, and the weir behind the culvert.

Also a site visit to get a greater appreciation of successful works delivered at Badu Mangroves would be advantageous in developing concepts to improve NNR Wetland.

Thanks again.

Regards,

[redacted]
Site Supervisor
Parramatta Light Rail Stage 2
Infrastructure and Place
Transport for NSW
M 0491 221 217
Level 10, 130 George Street, Parramatta, NSW 2150

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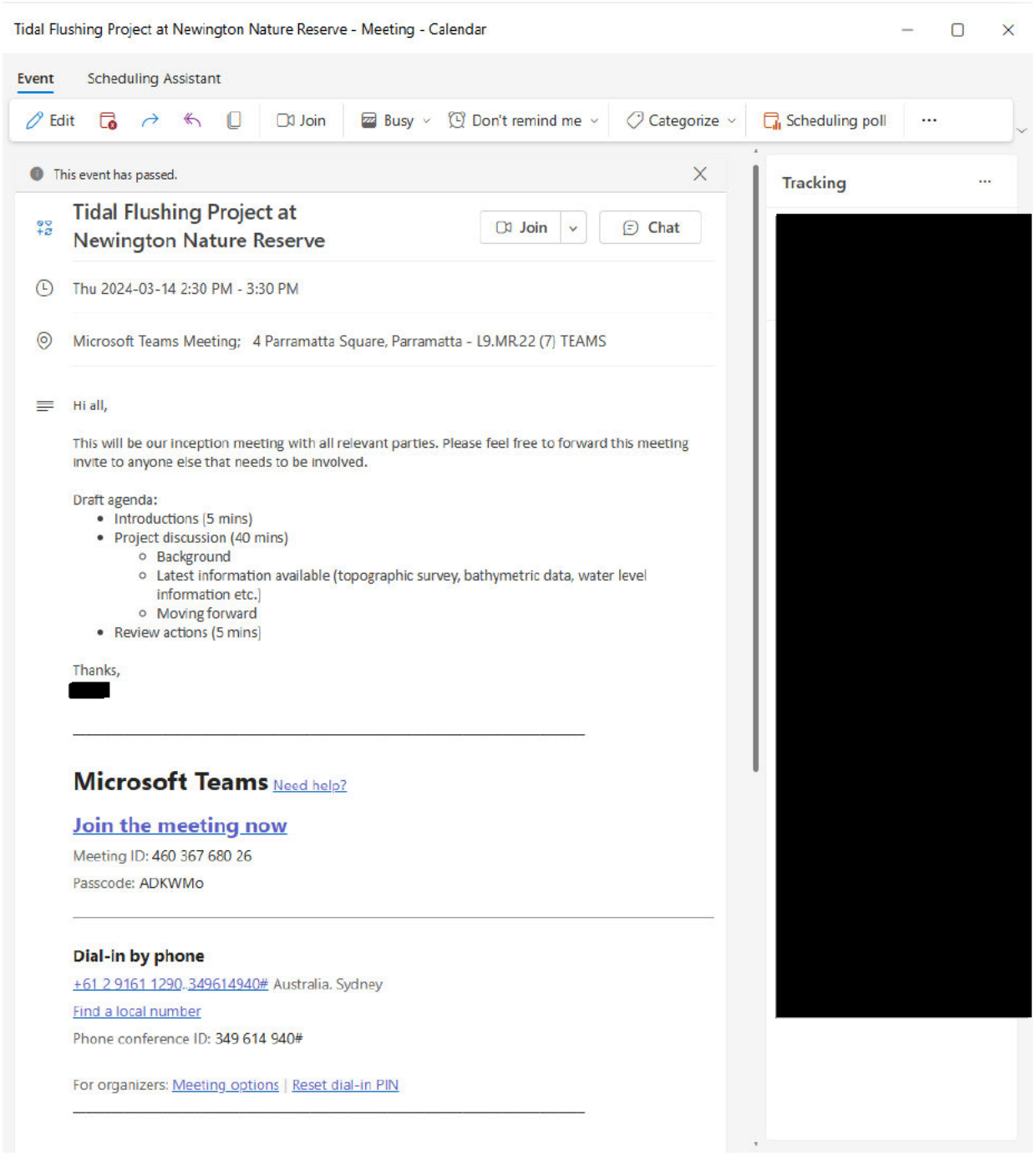

Tidal Flushing Project at Newington Nature Reserve - Meeting - Calendar

Event Scheduling Assistant

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This event has passed.

Tidal Flushing Project at Newington Nature Reserve

Join Chat

Thu 2024-03-14 2:30 PM - 3:30 PM

Microsoft Teams Meeting; 4 Parramatta Square, Parramatta - L9.MR.22 (7) TEAMS

Hi all,

This will be our inception meeting with all relevant parties. Please feel free to forward this meeting invite to anyone else that needs to be involved.

Draft agenda:

- Introductions (5 mins)
- Project discussion (40 mins)
  - Background
  - Latest information available (topographic survey, bathymetric data, water level information etc.)
  - Moving forward
- Review actions (5 mins)

Thanks,
[redacted]

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Tracking ...

[redacted]

[redacted]

Mon 2024-05-20 3:08 PM

Tidal Flushing Project - Newington Nature Reserve

Tue 2024-05-21 11:00 AM - 12:00 PM No conflicts

Microsoft Teams Meeting; 4 Parramatta Square, Parramatta - L9.MR.22 (7) TEAMS

Hi all,

To discuss MHL's preliminary hydraulic modelling / findings and to confirm next steps.

Please feel free to forward this invite to any relevant parties that should attend.

Thanks,
[redacted]

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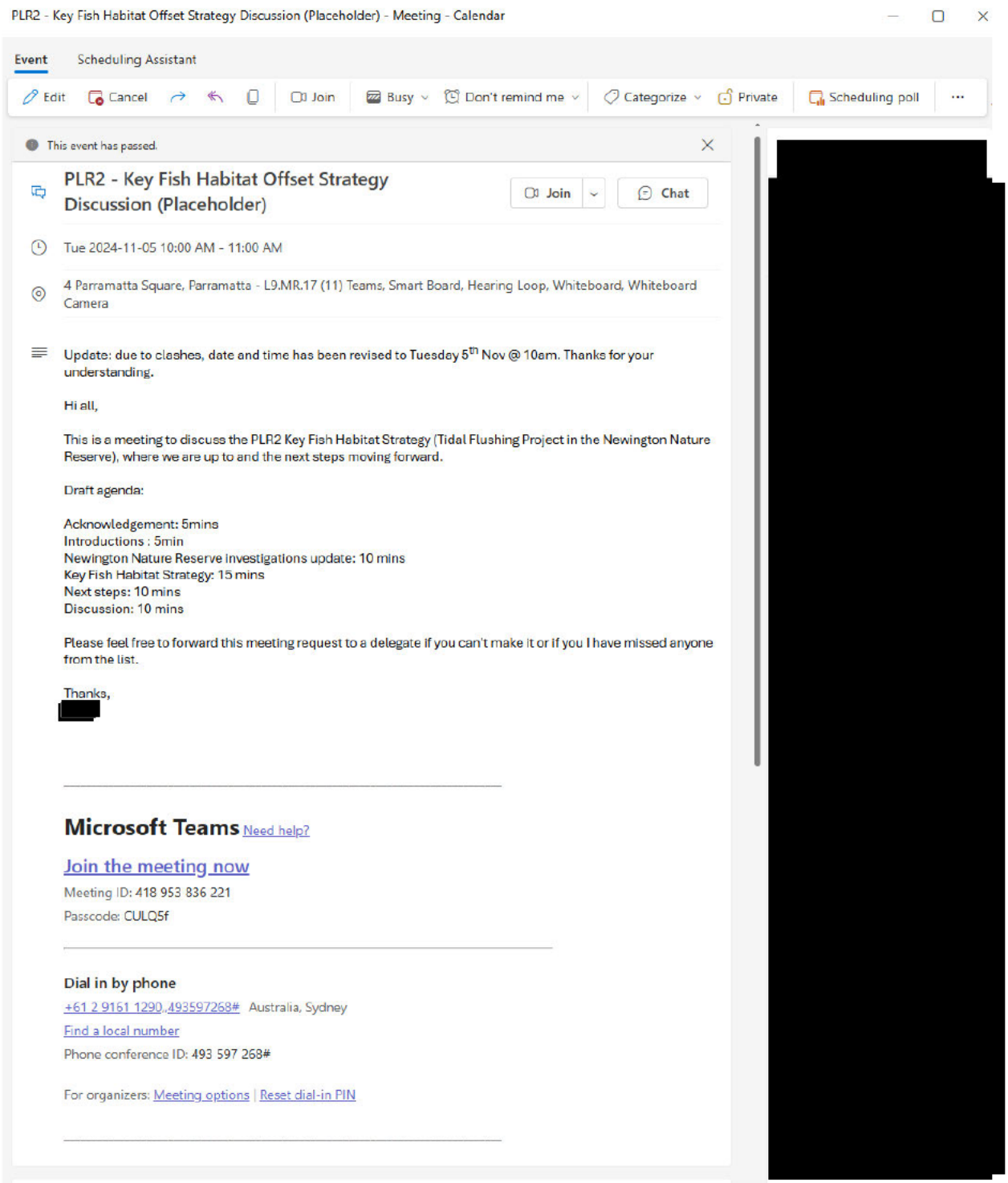

PLR2 - Key Fish Habitat Offset Strategy Discussion (Placeholder) - Meeting - Calendar

Event | Scheduling Assistant

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This event has passed.

PLR2 - Key Fish Habitat Offset Strategy Discussion (Placeholder)

Join | Chat

Tue 2024-11-05 10:00 AM - 11:00 AM

4 Parramatta Square, Parramatta - L9.MR.17 (11) Teams, Smart Board, Hearing Loop, Whiteboard, Whiteboard Camera

Update: due to clashes, date and time has been revised to Tuesday 5th Nov @ 10am. Thanks for your understanding.

Hi all,

This is a meeting to discuss the PLR2 Key Fish Habitat Strategy (Tidal Flushing Project in the Newington Nature Reserve), where we are up to and the next steps moving forward.

Draft agenda:

Acknowledgement: 5mins
Introductions : 5min
Newington Nature Reserve investigations update: 10 mins
Key Fish Habitat Strategy: 15 mins
Next steps: 10 mins
Discussion: 10 mins

Please feel free to forward this meeting request to a delegate if you can't make it or if you I have missed anyone from the list.

Thanks,
[redacted]

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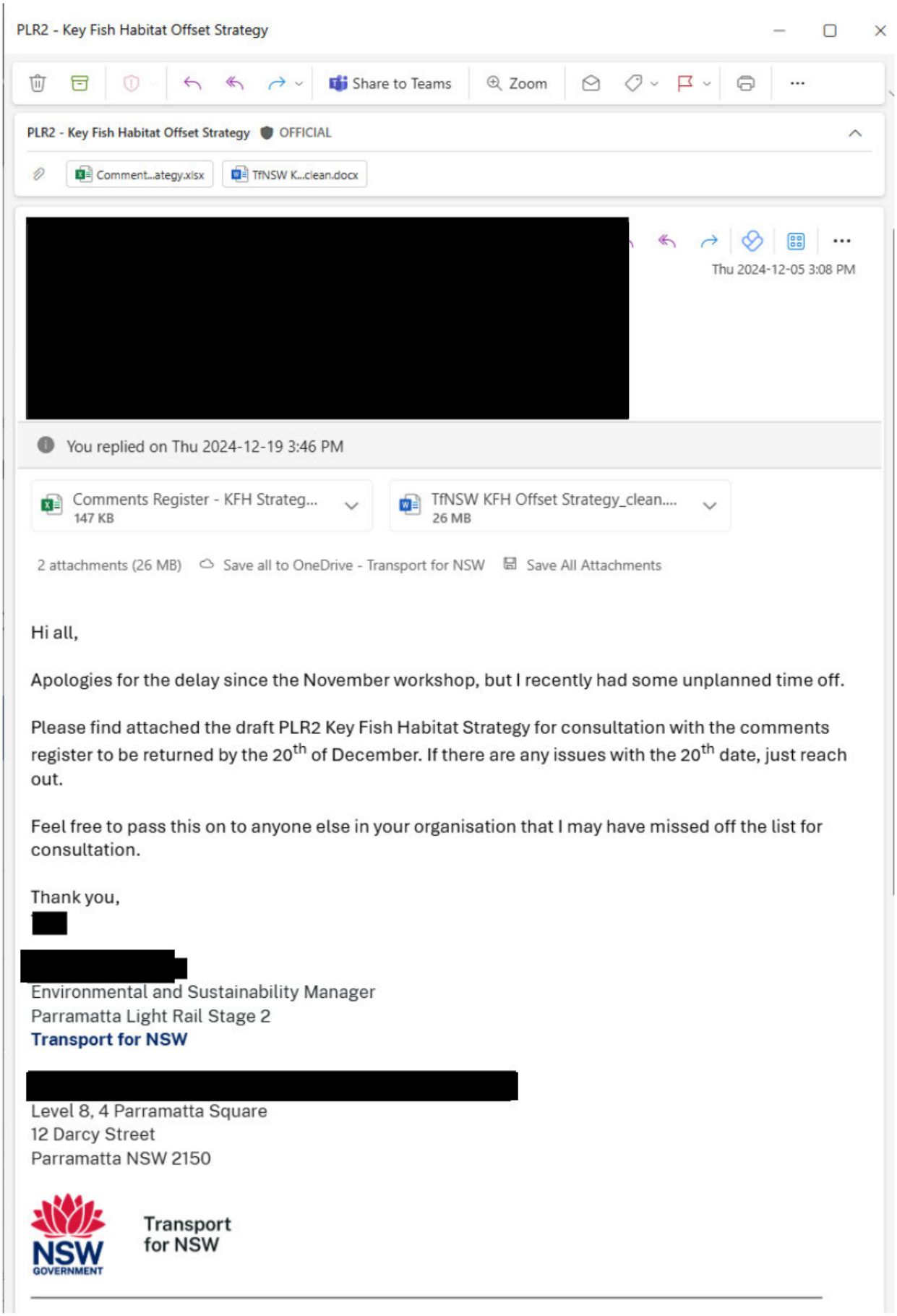
[redacted]



PLR2 - Key Fish Habitat Offset Strategy

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Comment...ategy.xlsx | TfNSW K...clean.docx

[redacted]

Thu 2024-12-05 3:08 PM

You replied on Thu 2024-12-19 3:46 PM

Comments Register - KFH Strateg... 147 KB

TfNSW KFH Offset Strategy_clean.... 26 MB

2 attachments (26 MB) Save all to OneDrive - Transport for NSW Save All Attachments

Hi all,

Apologies for the delay since the November workshop, but I recently had some unplanned time off.

Please find attached the draft PLR2 Key Fish Habitat Strategy for consultation with the comments register to be returned by the 20th of December. If there are any issues with the 20th date, just reach out.

Feel free to pass this on to anyone else in your organisation that I may have missed off the list for consultation.

Thank you,

[redacted]

[redacted]

Environmental and Sustainability Manager
Parramatta Light Rail Stage 2
Transport for NSW

[redacted]

Level 8, 4 Parramatta Square
12 Darcy Street
Parramatta NSW 2150

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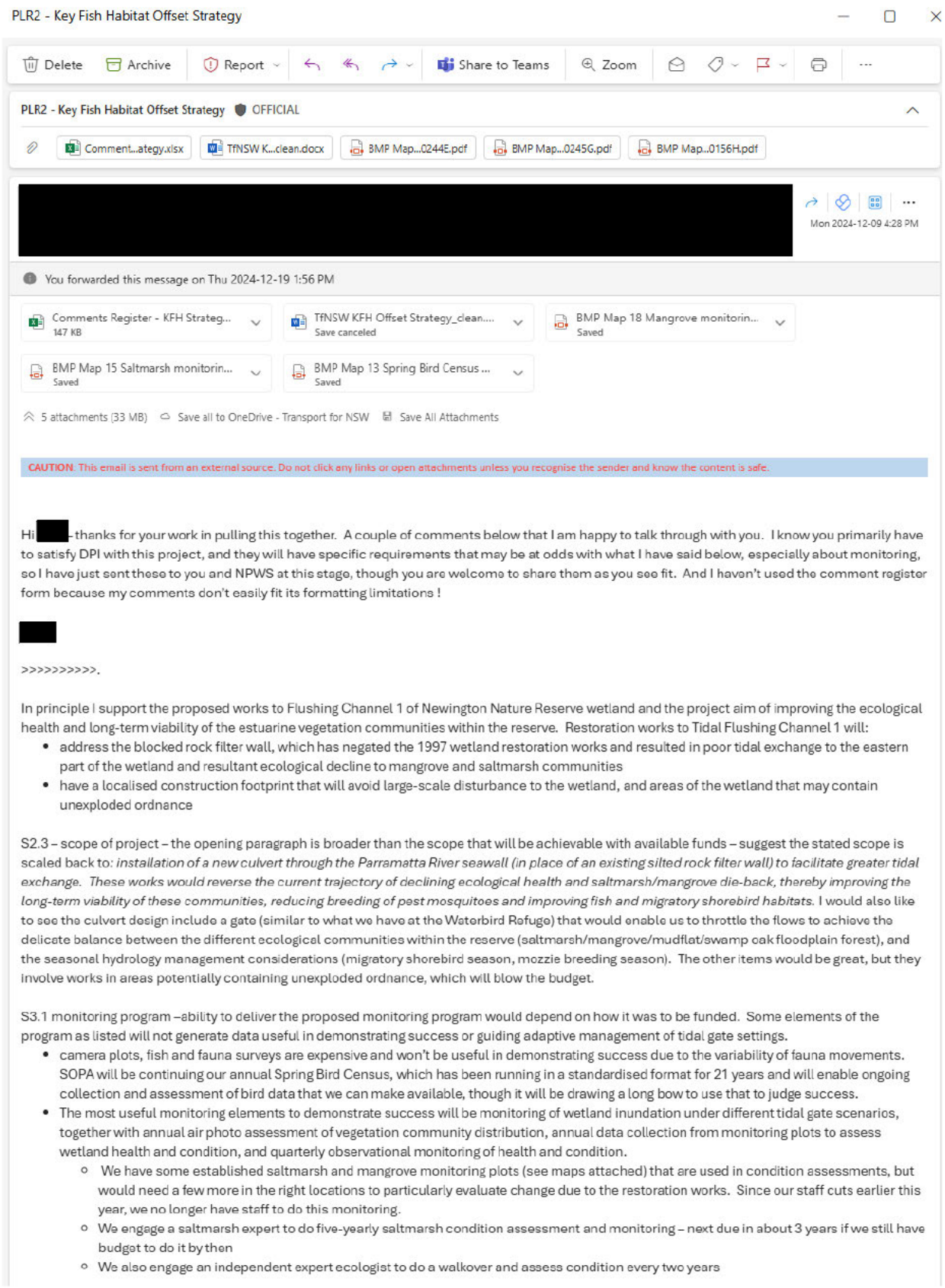

PLR2 - Key Fish Habitat Offset Strategy

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Comment...ategy.xlsx | TfNSW K...clean.docx | BMP Map...0244E.pdf | BMP Map...0245G.pdf | BMP Map...0156H.pdf

[redacted]

Mon 2024-12-09 4:28 PM

You forwarded this message on Thu 2024-12-19 1:56 PM

Comments Register - KFH Strateg... 147 KB | TfNSW KFH Offset Strategy_clean.... Save canceled | BMP Map 18 Mangrove monitorin... Saved

BMP Map 15 Saltmarsh monitorin... Saved | BMP Map 13 Spring Bird Census ... Saved

5 attachments (33 MB) | Save all to OneDrive - Transport for NSW | Save All Attachments

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Hi [redacted] - thanks for your work in pulling this together. A couple of comments below that I am happy to talk through with you. I know you primarily have to satisfy DPI with this project, and they will have specific requirements that may be at odds with what I have said below, especially about monitoring, so I have just sent these to you and NPWS at this stage, though you are welcome to share them as you see fit. And I haven't used the comment register form because my comments don't easily fit its formatting limitations !

[redacted]

>>>>>>>>>>.

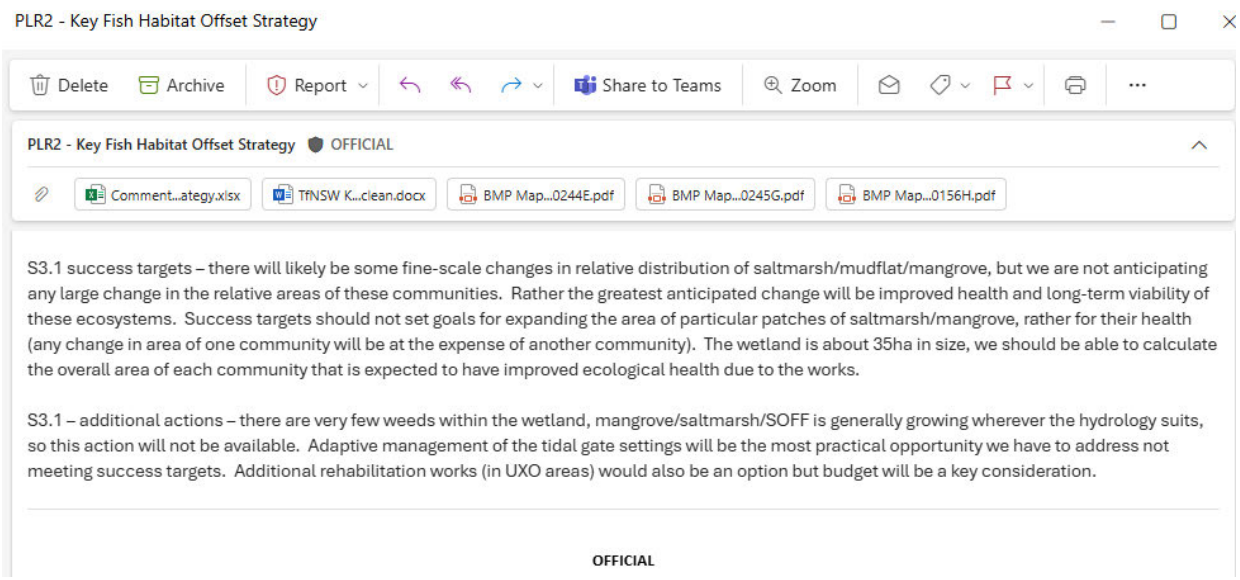
In principle I support the proposed works to Flushing Channel 1 of Newington Nature Reserve wetland and the project aim of improving the ecological health and long-term viability of the estuarine vegetation communities within the reserve. Restoration works to Tidal Flushing Channel 1 will:

- address the blocked rock filter wall, which has negated the 1997 wetland restoration works and resulted in poor tidal exchange to the eastern part of the wetland and resultant ecological decline to mangrove and saltmarsh communities
- have a localised construction footprint that will avoid large-scale disturbance to the wetland, and areas of the wetland that may contain unexploded ordnance

S2.3 – scope of project – the opening paragraph is broader than the scope that will be achievable with available funds – suggest the stated scope is scaled back to: *installation of a new culvert through the Parramatta River seawall (in place of an existing silted rock filter wall) to facilitate greater tidal exchange. These works would reverse the current trajectory of declining ecological health and saltmarsh/mangrove die-back, thereby improving the long-term viability of these communities, reducing breeding of pest mosquitoes and improving fish and migratory shorebird habitats.* I would also like to see the culvert design include a gate (similar to what we have at the Waterbird Refuge) that would enable us to throttle the flows to achieve the delicate balance between the different ecological communities within the reserve (saltmarsh/mangrove/mudflat/swamp oak floodplain forest), and the seasonal hydrology management considerations (migratory shorebird season, mozzie breeding season). The other items would be great, but they involve works in areas potentially containing unexploded ordnance, which will blow the budget.

S3.1 monitoring program –ability to deliver the proposed monitoring program would depend on how it was to be funded. Some elements of the program as listed will not generate data useful in demonstrating success or guiding adaptive management of tidal gate settings.

- camera plots, fish and fauna surveys are expensive and won't be useful in demonstrating success due to the variability of fauna movements. SOPA will be continuing our annual Spring Bird Census, which has been running in a standardised format for 21 years and will enable ongoing collection and assessment of bird data that we can make available, though it will be drawing a long bow to use that to judge success.
- The most useful monitoring elements to demonstrate success will be monitoring of wetland inundation under different tidal gate scenarios, together with annual air photo assessment of vegetation community distribution, annual data collection from monitoring plots to assess wetland health and condition, and quarterly observational monitoring of health and condition.
    - We have some established saltmarsh and mangrove monitoring plots (see maps attached) that are used in condition assessments, but would need a few more in the right locations to particularly evaluate change due to the restoration works. Since our staff cuts earlier this year, we no longer have staff to do this monitoring.
    - We engage a saltmarsh expert to do five-yearly saltmarsh condition assessment and monitoring – next due in about 3 years if we still have budget to do it by then
    - We also engage an independent expert ecologist to do a walkover and assess condition every two years


PLR2 - Key Fish Habitat Offset Strategy

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Comment...ategy.xlsx TfNSW K...clean.docx BMP Map...0244E.pdf BMP Map...0245G.pdf BMP Map...0156H.pdf

S3.1 success targets – there will likely be some fine-scale changes in relative distribution of saltmarsh/mudflat/mangrove, but we are not anticipating any large change in the relative areas of these communities. Rather the greatest anticipated change will be improved health and long-term viability of these ecosystems. Success targets should not set goals for expanding the area of particular patches of saltmarsh/mangrove, rather for their health (any change in area of one community will be at the expense of another community). The wetland is about 35ha in size, we should be able to calculate the overall area of each community that is expected to have improved ecological health due to the works.

S3.1 – additional actions – there are very few weeds within the wetland, mangrove/saltmarsh/SOFF is generally growing wherever the hydrology suits, so this action will not be available. Adaptive management of the tidal gate settings will be the most practical opportunity we have to address not meeting success targets. Additional rehabilitation works (in UXO areas) would also be an option but budget will be a key consideration.

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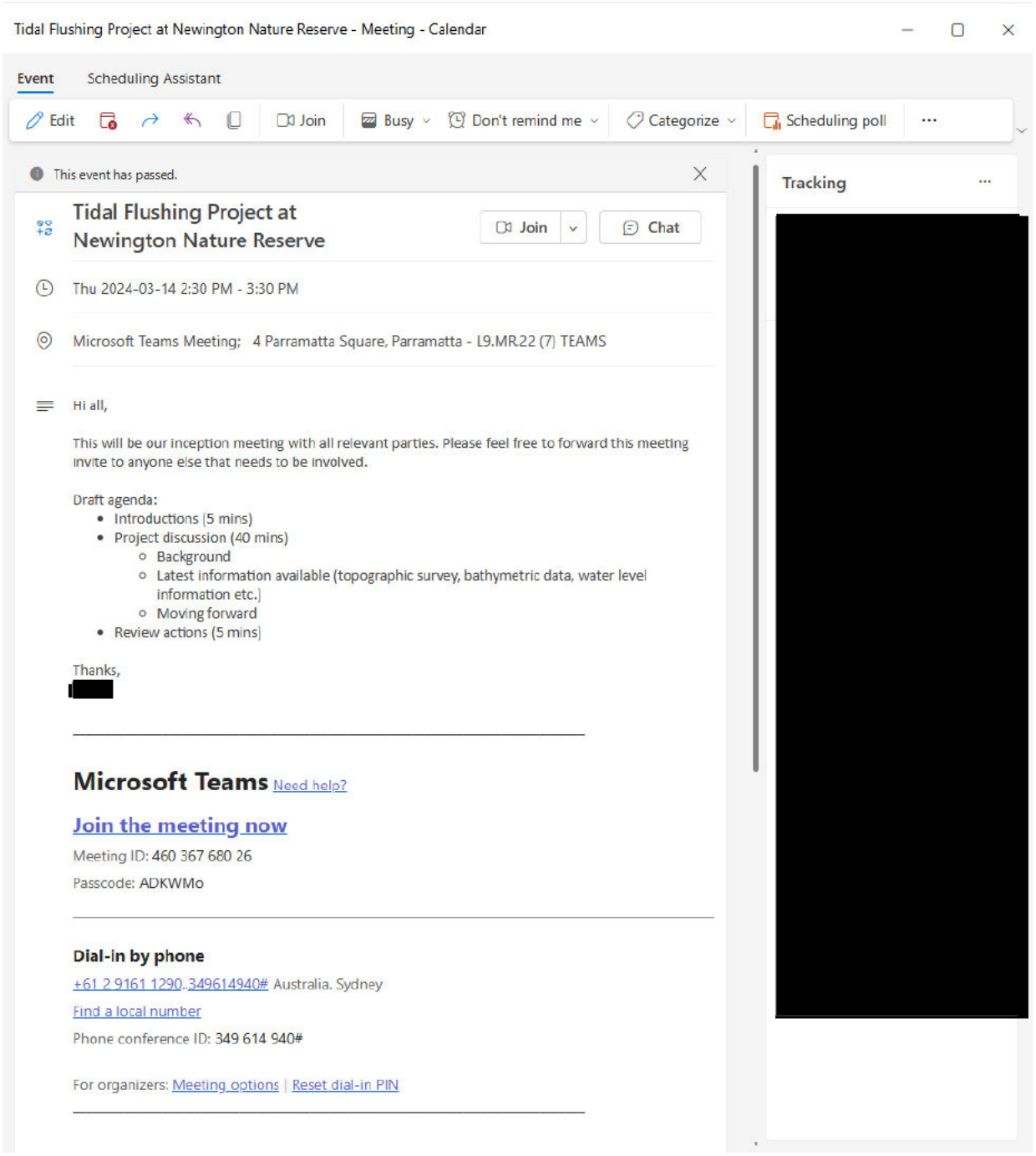
Appendix C: NPWS consultation evidence

Table 8 – Consultation log

In / Out	Date	Medium	Details of contact
	14 Mar 24	Teams meeting	Workshop – inception meeting
	21 May 24	Teams meeting	Meeting to discuss MHL preliminary hydraulic modelling and findings
	5 Nov 24	Teams meeting	Meeting to discuss MHL data collection and option assessment and KFH strategy
Out	5 Dec 24	Email	Requesting comments on draft Key Fish Habitat Strategy
Out	19 Dec 24	Email	Follow-up on requesting comments on draft Key Fish Habitat Strategy



Tidal Flushing Project at Newington Nature Reserve - Meeting - Calendar

Event Scheduling Assistant

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[redacted]

Mon 2024-05-20 3:08 PM

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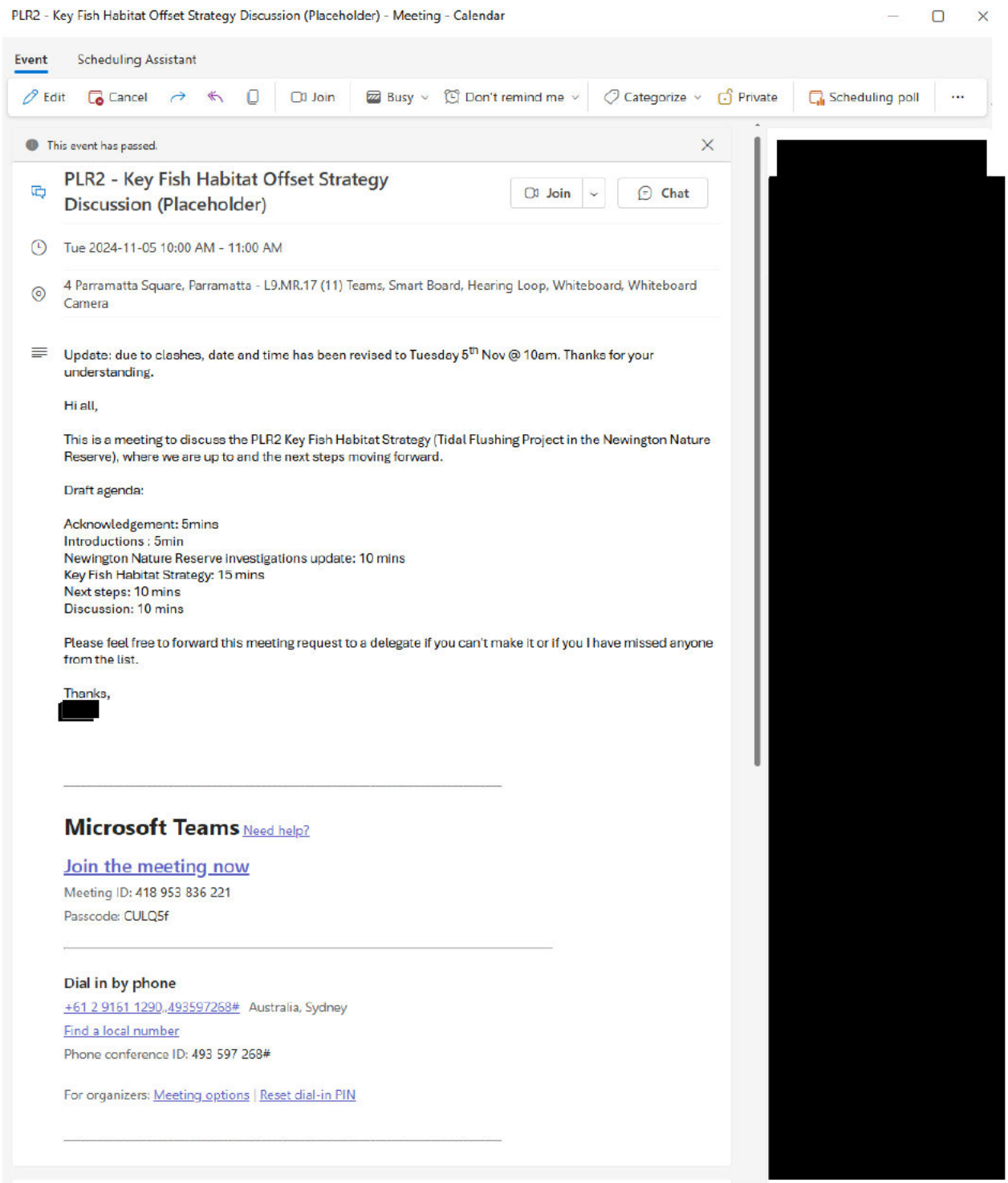

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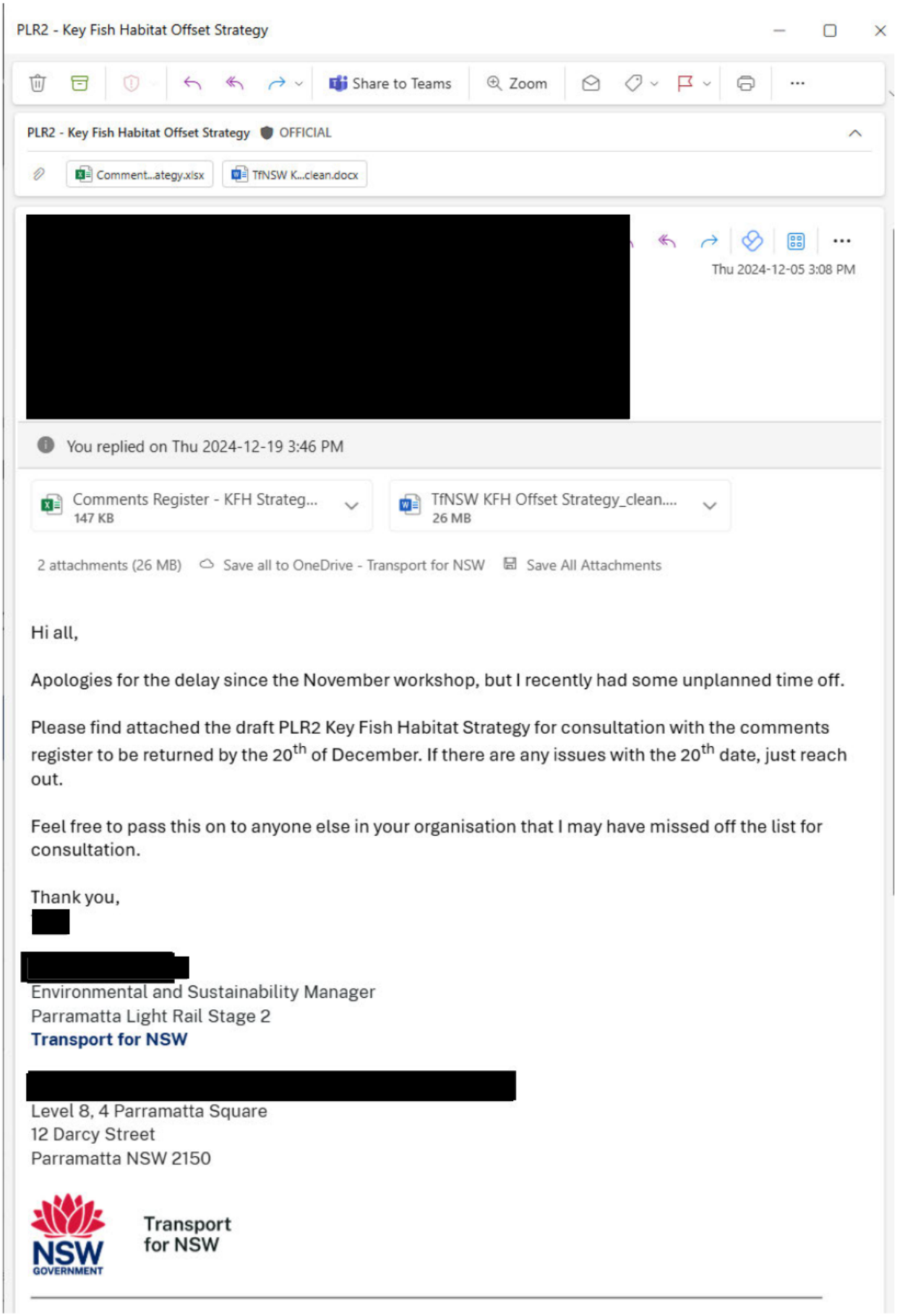

PLR2 - Key Fish Habitat Offset Strategy

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[redacted]
Environmental and Sustainability Manager
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Transport for NSW

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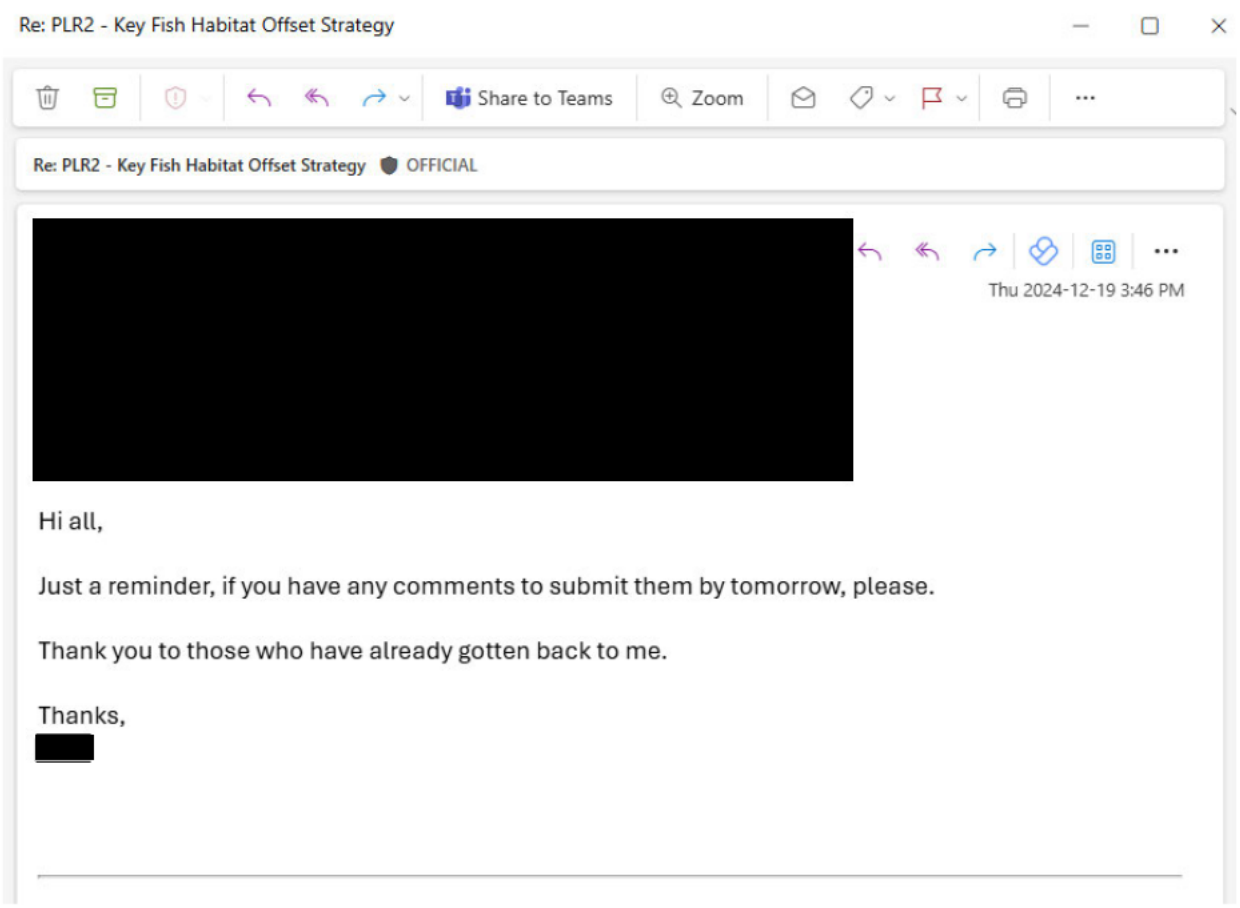
Re: PLR2 - Key Fish Habitat Offset Strategy
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Re: PLR2 - Key Fish Habitat Offset Strategy
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[redacted]
Thu 2024-12-19 3:46 PM
Hi all,
Just a reminder, if you have any comments to submit them by tomorrow, please.
Thank you to those who have already gotten back to me.
Thanks,
[redacted]

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