

Appendix L Addendum to Preliminary Integrated Water Management Plan

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Sydney Metro West

Sydney Olympic Park Over and Adjacent Station
Development

Addendum to Appendix X - Preliminary Integrated
Water Management Plan

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Executive summary

This addendum report supports a Concept State Significant Development Application (Concept SSDA) submitted to the Department of Planning and Environment (DPE) pursuant to part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

Sydney Metro is seeking to secure concept approval for an over station development and adjacent station development on an area defined as Site 47 within the Central Precinct of Sydney Olympic Park. A utilities and infrastructure services assessment was previously undertaken and presented in the Sydney Olympic Park Metro Station - Over & Adjacent Station Development Environmental Impact Statement (SSD-35283699) which was exhibited from 16 November 2022 until 13 December 2022. During this period agency advice was received along with submissions from the public.

DPE issued a letter to Sydney Metro on 16 December 2022 requesting a response to the issues raised during the public exhibition of the application. DPE also issued a Request for Further Information (RFI) on 6 February 2023 and the Submissions Report provides a response to these matters.

This addendum report addresses Integrated Water Management Plan related to concerns around existing biodiversity and water quality modelling raised in agency submissions from the Department of Planning and Environment – Environment and Heritage Group (EHG) and the Sydney Olympic Park Authority (SOPA).

Consultation was undertaken with SOPA to confirm proposed stormwater system and outlet points. The outcome of the consultation SOPA have indicated while the catchment area to the Northern Water Feature (NWF) will increase, the increase is not significant. The aquatic ecology and threatened species impact should be mitigated with the exploration of further stormwater design at the Detailed SSDA stage to minimise increases of stormwater flow to NWF. A letter from SOPA is provided in Appendix A to this Addendum.

Further to this water quality modelling has been refined to be more conservative and include the consideration of poor plant growth as requested in the submissions received.

It is recommended that the Detailed SSDA application includes additional mitigation measures, to those outlined in the Concept SSDA EIS Appendix X – Integrated Water Management and Quality Plan (Sydney Metro, 2022), to address agency comments including:

- Additional Stormwater quality treatment devices
- Reduction in the use of rainwater tank use

Additional water quality devices and strategies have been proposed to ensure the compliancy of the stormwater strategy, including additional:

- 2 stormwater filter cartridges
- 96m² of raingardens/tree pits
- 7 oceanguard (gully pit inserts)

1 Introduction

This addendum to the Integrated Water Management Plan and Quality Assessment (IWMP) report supports a Concept State Significant Development Application (Concept SSDA) submitted to the Department of Planning and Environment (DPE) pursuant to part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Sydney Metro is seeking to secure concept approval for an over station development (OSD) and adjacent station development (ASD) on an area defined as Site 47 within the Central Precinct of Sydney Olympic Park. A IWMP assessment was previously undertaken and presented in the Sydney Olympic Park Metro Station - Over & Adjacent Station Development Environmental Impact Statement (EIS) (SSD-35283699) which was exhibited from 16 November 2022 until 13 December 2022. During this period agency submissions were received along with submissions from the public.

DPE issued a letter to Sydney Metro on 16 December 2022 requesting a response to the issues raised during the public exhibition of the application. DPE also issued a Request for Further Information (RFI) on 6 February 2023 and the Submissions Report provides a response to these matters.

Agency submissions have been received in response to the EIS. This addendum report addresses stormwater system related issues raised in agency submissions from the Department of Planning and Environment – Environment and Heritage Group (EHG) and the Sydney Olympic Park Authority (SOPA).

This report should be read in conjunction with the Sydney Olympic Park Over and Adjacent Station Development EIS Appendix X - Preliminary Integrated Water Management Plan (Sydney Metro, 2022) which details the methodology and the applicable industry guidelines.

2 Agency Submissions

The following Table 2-1 outlines how the agency submission comments from Department of Planning and Environment – Environment and Heritage Group (EHG) and the Sydney Olympic Park Authority (SOPA) have been addressed.

Sydney Water comments have been covered within the Sydney Olympic Park Over and Adjacent Station Development Addendum to Appendix EE Preliminary Station Utilities & Infrastructure Servicing Assessment.

Table 2-1 Agency Comments

Key Issue	Comment	Report Reference
Biodiversity	<p>On 22 February 2022, EHG issued its determination to the DPE Planning Group that the proposed development is not likely to have a significant impact on biodiversity values and that the application does not need to be accompanied by a BDAR.</p> <p>In issuing this BDAR Waiver Request EHG advised that it supports the Sydney Olympic Park Authority’s recommendation that stormwater runoff (at all stages) be diverted from the Northern Water Feature so that Green and Golden Bell Frog Habitat is not impacted. This Concept Application and future SSD’s should advise how this recommendation will be complied with.</p>	Refer to Appendix A for further information and Section 3.1.
Appendix X: Integrated Water Management Report	MUSIC calculations appear to have been based on typical urban runoff data and not on the local water quality data, as there were no mention or references. MUSIC calculations should be made with local water quality data.	Refer to Section 4.1 for response. Local water quality data have been adopted in the refined MUSIC modelling
Appendix X: Integrated Water Management Report	MUSIC calculations appear to have been based on typical data, assuming the ability of such basins (rain gardens) to remove pollutants while the trees/sedges are growing well. But given three tall buildings on the development site, two tall buildings in the nearby site and also more are likely within 100m radius, the shadows are supposed to diminish the ability of such trees/sedges to grow well. The reduced growth must be diminishing the pollution reduction capacity. It is not clear if the MUSIC calculations have considered reduced level of pollution reduction performance and, hence whether still meeting the SOPA WSUD Guidelines. Detailed Integrated Water Management Report should (a) take into consideration projections from Detailed Shadow Impact Report regarding MUSIC calculations for Bio-retention basins (b) align with SOPA WSUD Guidelines.	Refer to Section 4.2 for response. MUSIC model have been updated by selecting the vegetation with ineffective nutrient removal plants

3 Sydney Olympic Park Authority Consultation

3.1 Biodiversity

Sydney Olympic Park Authority's (SOPA) have advised that it estimated the current stormwater strategy would result in an increase to the NWF catchment by approximately 1.3ha. While this is not a significant increase, the NWF is currently at capacity. SOPA is concerned regarding the cumulative impact to the aquatic ecology and threatened species due to the additional catchment.

The current submitted concept SSSA stormwater strategy for the Olympic Park Metro station development have incorporated Drainage On Site Detention (DOSD) to attenuate the additional flow from the development in order for the post development discharge flow to be equal or no greater than pre development discharge flow. The current stormwater strategy and design have been developed to satisfied SOPA drainage requirement as specified in the SOPA Stormwater Management and Water Sensitive Urban Design Policy dated October 2016.

While the post development discharge flow is controlled the volume of stormwater generated from the post development will increase. In consultation with SOPA, this increase of volume of stormwater should be able to be mitigated with further design consideration by Metro development and/or by other developments to minimise stormwater flow to NWF. This consideration shall be explored at the Detailed SSSA stage.

4 Water Quality Modelling

4.1 Input Data

The urban runoff data and evapotranspiration data has been reviewed and updated to be in accordance with the Sydney Olympic Park MUSIC Modelling Guideline. The water quality data adopted in the updated MUSIC modelling is based on the current City of Parramatta Council water quality data which consists numerous data ranging from 1984 to 2007.

4.2 Stormwater Quality

The design has evaluated how to promote Water Sensitive Urban Design (WSUD) and ensure compliance with SOPA standards as far as feasible.

Modelling of the proposed development was undertaken using Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software. The software was utilised to simulate urban stormwater systems operating at a range of temporal and spatial scales.

MUSIC models the total amounts of gross pollutants and nutrients produced within various types of catchments. It allows the user to simulate the removal rates expected when implementing removal filters to reduce the increased gross pollutant and nutrient levels created by the proposed development.

Using the latest architectural and landscape plans as a baseline layout, WSUD treatment trains have been identified. The following treatments are proposed to be implemented within the proposed development site:

- Tree Pits/Raingardens (assumed 2x2m surface dimension)
- Ocean Protect Storm filters (or similar filters of equivalent specification)
- Ocean Protect OceanGuard (or similar product of equivalent specification)

It should be noted that both Tree Pits/Raingardens were modelled as Vegetated with Ineffective Nutrient Removal Plants to account for the limited sunlight projected within the Concept SSDA site boundary.

For treatment analysis, the station precinct has been categorised as a stormwater harvesting catchment with Herb Elliot Avenue as its receiving node.

Based on SOPA guidelines, a MUSIC model has been created to assess the treatment effectiveness. The catchment areas used for the MUSIC model is shown in Figure 4-1



Figure 4-1: MUSIC Model Catchment Plan

The MUSIC setup and results are shown in Figure 4-2 below.

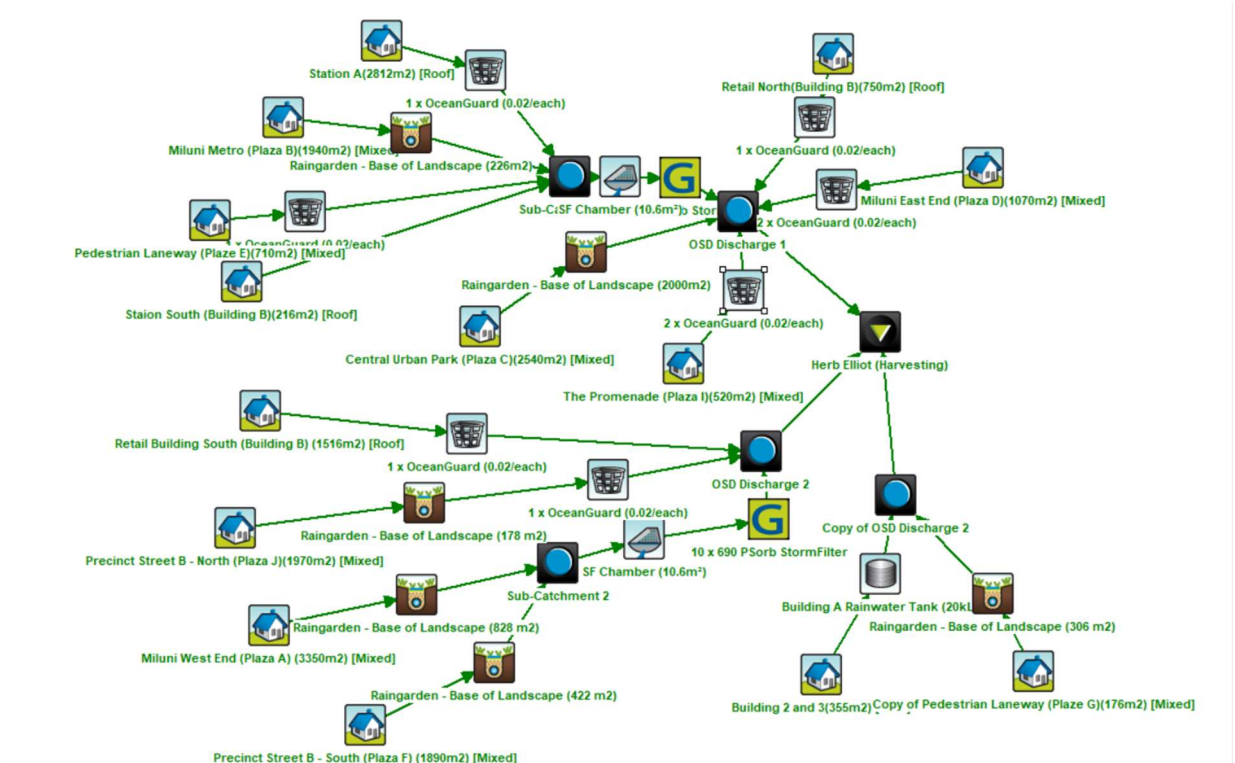


Figure 4-2 MUSIC Model for Sydney Metro Olympic Park Catchment

A summary of the treatment nodes' catchment areas is tabulated in Table 4-1.

Table 4-1 Summary of treatment nodes' catchment areas

Catchment area	% Impervious	% Pervious	Area (ha)
Station A (North)	100	0	0.365
Station B (South)	100	0	0.153
Retail A North (Building B)	100	0	0.153
Building 1	100	0	0.270
Miluni West End (Plaza A)	90	10	0.335
Miluni Metro (Plaza B)	90	10	0.194
Central Urban Park (Plaza C)	14	86	0.254
Miluni East End (Plaza D)	100	0	0.107
Pedestrian Laneway (Plaza E)	100	0	0.071
Precinct Street B – South (Plaza F)	90	10	0.185
The Promenade (Plaza I)	69	31	0.052
Precinct Street B – North (Plaza J)	90	10	0.197
Building 2 & 3	100	0	0.355
Plaza G	83	17	0.176

The catchment sizes have altered since the SSSA submission due to grading and roof design development.

Changes in proposed treatment train are identified in Table 4-2 below.

Table 4-2 Water Quality Treatment summary

Treatment Option	Updated Amount	Previous Amount	Delta
Rainwater Tank	1	4	-3
Stormwater filter cartridge	22	20	2
Raingardens/tree pits	3960m ²	3864m ²	96m ²
Oceanguard (gully pit insert)	8	1	7

Use of rainwater tanks have been decreased due to SOPA's recommendation to utilise the WRAMS system. The treatment options will be reviewed and refined as part of the stormwater design at the Detailed SSSA stage.

The working treatment train satisfies SOPA baseline pollution reduction targets for stormwater harvesting catchment. Refer to Table 4-3 for results and confirmation of water quality (WQ) target achievement.

Table 4-3 MUSIC results for Sydney Olympic Park

Pollutant	SOPA reduction targets (%)	Results (%)	Water Quality Target Achieved
Total suspended solids (kg/year)	93	92.9	Yes
Total phosphorus (kg/year)	65	65	Yes

Pollutant	SOPA reduction targets (%)	Results (%)	Water Quality Target Achieved
Total nitrogen (kg/year)	54	54.1	Yes
Gross pollutants (kg/year)	100	100	Yes

5 Conclusion and recommendations

This Addendum to the Integrated Water Management Plan Assessment has been written to support a Concept SSDA and to respond to agency comments and advice received to the EIS.

Section 4 addresses the main body of comments in regard to the IWMP. Further design refinement at future stages of design of the proposal would ensure that the stormwater management system is comprehensively assessed and adequately addressed in a future Detailed SSDA.

Additional water quality devices and strategies have been proposed to ensure the compliancy of the stormwater strategy, including the following additional items:

- 2 stormwater filter cartridges
- 96m² of raingardens/tree pits
- 7 Oceanguard (gully pit inserts)

See Appendix A to this Addendum for a letter from Sydney Olympic Park Authority which provides further clarification on matters stated in its submission and advice to the Concept SSDA EIS (summarised at Table 2-1 above). This relates to catchment area and stormwater volumes and their impacts in relation to the aquatic ecology and threatened species at the NWF.

As acknowledged in the letter, the Metro station development would result in an increase to the NWF catchment, however the increase of stormwater flow is not a significant increase. This increase of stormwater flow may pose cumulative impacts, but the impacts can be mitigated within the Metro development and/or by other developments.

Mitigation measures shall be explored to minimise the increase to stormwater flows to the NWF at the Detailed SSDA stage.

Appendix A SOPA Letter

14 June 2023

Attn: Paul Keywood
Manager, Planning Approvals
Customer, Operations and Outcomes
Sydney Metro
Level 43, 680 George Street,
Sydney NSW 2000

SOPA response letter: SSD- 35283699 – Response to Submissions – Stormwater

Dear Paul,

SOPA has reviewed the proposed SMW stormwater strategy and design plans (SSD-35283699) and has considered the impact of proposal to the receiving waters of the Northern Water Feature (NWF).

SOPA's previous advice (03/02/2023) included that:


A 2021 audit of the NWF concluded that any future development "...within this catchment should incorporate its own stormwater management controls". Consistent with this recommendation, the stormwater management design should include local management controls to satisfy contemporary stormwater quantity and quality guidelines and SOPA's Water Sensitive Urban Design Policy, and thereby alleviate hydraulic and pollutant stress on the NWF.

SOPA has obtained independent technical advice of the hydraulic impact of the proposal to the Northern Water Feature; it is estimated that the proposal would result in an increase to the NWF catchment by approximately 1.3ha, resulting in an additional ~12 ML/yr stormwater flow to the NWF. While this is not a significant increase (1.7%), it is important to note that the NWF is currently at capacity, and there is concern that the proposal may pose cumulative impacts to this system and the aquatic ecology and threatened species that it supports overtime. As such, SOPA requests that stormwater design at the Detailed SSDA stage further explores options to minimise stormwater flow to NWF.

The SEAR's required that the integrated water management plan for the development should "demonstrate compliance with the local council or other drainage or water authority requirements and avoids adverse impacts on any downstream properties". Therefore, SOPA requires that the proposed stormwater design at the Detailed SSDA stage complies with SOPA's Stormwater Management and Water Sensitive Urban Design Policy (attached, page 15-18 : Policy Compliance Checklist).

It is important to note that the SEAR's requirement that the groundwater discharge generated by the development during and post-construction not be discharged to the NWF is still relevant, and that stormwater generated during construction is not to be discharged to the NWF.

Yours sincerely,



Vivienne Albin,
Acting Director, Environment and Planning

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