Our ref: DOC21/1035942
Senders ref: SSD 25452459

Pamela Morales
Principal Planning Officer
Energy Resource Assessments
Planning and Assessment Group
Department of Planning, Industry and Environment
4 Parramatta Square,
Parramatta NSW 2150

Dear Ms Morales

Subject: EIS - First Building Bradfield City Centre (SSD-25452459) (Liverpool City)

Thank you for your email received 22 November 2021 requesting comments from Environment, Energy and Science Group (EES) in the Department of Planning, Industry and Environment (DPIE) on the exhibited Environmental Impact Statement (EIS) for the subject proposal.

EES has undertaken a review of the EIS prepared by Keylan Consulting group, dated November 2021 along with the supporting plans and reports. It is noted that the proposed development is located on land certified under the 2007 Biodiversity Certification Order for State Environmental Planning Policy (Sydney Region Growth Centres) 2006. As such an assessment of biodiversity impacts has not been undertaken. EES raises no concern in this regard.

A Flood Assessment prepared by Advisian has been provided and EES raises no comment or concern in relation to this assessment.

In relation to waterway health, EES provides comments and a request for further information at Attachment A.

Should you have any queries regarding this matter, please contact Shaun Hunt, Senior Conservation Planning Officer via shaun.hunt@environment.nsw.gov.au or 02 8275 1617.

Yours sincerely

S. Harrison

21/12/21

Susan Harrison
Senior Team Leader Planning
Greater Sydney Branch
Biodiversity and Conservation

Attachment A – EES Waterway health comments for the First Building Bradfield City Centre (SSD-25452459)

Comments are specific to Section 3 – Stormwater Management of the Bradfield Civil Design Report and the relevant Civil Engineering Plans provided at Appendix D of the EIS.

The EIS specifies the intention for a Country led approach, and subsequent priority for protecting and restoring waterways in the architectural design of the First Building at Bradfield, which is consistent with the NSW Government vision for the Western Parkland City. EES notes that there is an unprecedented opportunity for Bradfield Stage 1A to '…*set the agenda for sustainable city-making*' (see Architectural Design Report), yet this opportunity is not clearly translated into the stormwater management strategy at the site. While the strategy adopts the stormwater quality (load reduction) targets outlined in the Western Sydney Aerotropolis Development Control Plan (DCP), it does not adopt the stormwater quantity (flow) targets which were specifically developed by the NSW Government to mitigate impacts on the waterways and other blue-grid components.

It is noted that the EIS is only for Stage 1A but it is important for the applicant to account for the proportion of the cumulative impact of the development on Thompsons Creek, which is an area of the Aerotropolis that is recognised as high ecological value. On this basis, EES recommends that the applicant use the 'MUSIC MODELLING TOOLKIT – WIANAMATTA' (hereafter termed 'toolkit') to amend the stormwater strategy and demonstrate how the Stage 1A achieves both the stormwater quality and quantity targets, which were publicly exhibited in the draft Western Sydney Aerotropolis DCP. EES recommends that the response to submissions (RtS) includes the following information:

- model parameters and climate file used for the MUSIC modelling is the same as provided in the toolkit – provide the MUSIC model files and/or a print-out of the parameters. This includes the parameters adopted for the treatment nodes
- conceptual layout of MUSIC model
- excel spreadsheet or tables of modelled outputs to demonstrate that the flow targets are achieved.

EES also notes that a full Stormwater Management Plan has not been provided. The stormwater management strategy described in Section 3 of the Civil Design Report has limited information to determine whether the full suite of development controls for stormwater management will be achieved at the site. It is expected that the RtS will include a separate Stormwater Management Plan, with full details of the interim and final/ultimate strategy (i.e. regional detention basin) that will achieve the stormwater quality and quality targets.

EES recommends that the Erosion and Sediment Control Plan for the site should include the construction phase stormwater quality targets specified in the toolkit, and now publicly available in the draft Western Sydney Aerotropolis DCP.

The following specific comments on the stormwater strategy are provided to inform the extent of information required in the RtS and separate Stormwater Management Plan:

- Some detailed catchments plans are provided in the Civil Engineering Plans, but the Civil Design Report does not provide catchments plans for the areas draining to the stormwater management systems. Catchment details such as areas, imperviousness and land types (road, roof, ground level, car parking) for each catchment should be included.
- A rainwater tank of 150kL is proposed for non-potable uses and irrigation. There are no details of the water demands in the Civil Design Report. The applicant should be providing this information as these demands are important in determining whether the flow targets will be met.
- No treatment is provided for the road catchment draining north. The applicant is to clarify how the stormwater targets for these northern catchments are to be achieved in the interim onsite detention basin.
- A GPT treatment node is mentioned but there are no details to indicate whether the stormwater quality targets are being achieved and whether the MUSIC modelling is adequate.
- A biorerention system located within the detention basin is proposed for the southern catchment. However, the design of the basin is inconsistent with toolkit and should be amended accordingly. It also is recommended that the following contemporary design guidelines be adopted in the revised EIS:
    - 800m^2 surface area (~3% of development catchment)
    - 800mm extended detention – too large, must be 300mm max. Note the extended detention of the bioretention does not form part of the OSD volume as will likely be full of water when storm burst occurs
    - 120m^2 filter media area (0.5% of development catchment)
    - hydraulic conductivity 2.5mm/hour – too low, must be 100mm/hr
    - 300mm filter media – too low should be 600mm (400mm min).
    - base not lined – should be lined with impermeable liner to avoid infiltration in the potential saline/sodic soils.
- No conceptual design of the stormwater management systems is provided in the Civil Design Report and Civil Engineering Plan to illustrate levels, hydraulic drainage levels, volumes, interfaces, drainage information.

In preparing the amended EIS, EES provides the following MUSIC modelling parameters for use. These parameters and specifications supersede those in the Liverpool City Council DCP, as they arise from calibrated and industry peer reviewed modelling.

If not listed below, EES recommends that the Blacktown City Council (2020) guidelines be used.

Note these parameters are consistent with the toolkit (MUSIC MODELLING TOOLKIT – WIANAMATTA).

MUSIC Modelling Climate

Rainfall	Penrith - 6 minute timestep 1/1/1999 – 31/12/2008 Annual Average = 691mm/yr	
Potential Evapotranspiration	Jan	183
	Feb	144
	March	127
	April	88
	May	60
	June	41
	July	48
	August	73
	September	107
	October	138
	November	150
	December	177
	Total	1336

MUSIC Source Node Assumptions

- Rainfall runoff parameters are listed below:

Impervious Area Parameters	
Rainfall Threshold (mm)	1.0
Pervious Area Parameters	
Soil Storage Capacity (mm)	150
Initial Storage (% of capacity)	30
Field Capacity (mm)	130
Infiltration Capacity Coefficient – a	175
Infiltration Capacity Exponent - b	2.5
Groundwater Properties	
Initial depth (mm)	10
Daily Recharge Rate (%)	25
Daily Baseflow Rate (%)	1.4
Daily Deep Seepage Rate (%)	0.0

- Impervious areas to be measured from development layout plans and it is to be assumed that effective impervious area is the same as total impervious areas for new development.

- Pollutant export parameters should adopt those recommended in *WSUD developer handbook MUSIC modelling and design guide 2020* (Blacktown City Council).

MUSIC treatment node parameters

- **Sedimentation basin**

Sedimentation basin	Acceptable parameter ranges
Surface area	User defined
Extended detention depth	Maximum extended detention depth of 350mm when part of a wetland system and up to 1.0m when acting in isolation.
Permanent pool volume	Calculate with depth up to maximum of 2.0m
Initial volume	Same as permanent pool volume
Exfiltration rate	Maximum of 0.01mm/hr
Evaporative loss	Maximum of 100% of PET

- **Wetlands**

Wetlands	Acceptable parameter ranges
Inlet pond volume	Set to zero if upstream sediment basin is modelled separately or size to target 95% removal of 125 um particles for 4EY flow events.
Extended detention depth	Maximum of 350mm
Permanent pool volume	0.3m-0.4m x wetland surface area
Exfiltration	Maximum of 0.01mm/hour
Evaporative loss	Maximum of 125% of PET
Outlet pipe	Adjust to ensure Notional Detention time is within ranges
Notional detention time	48-72 hours for detention depths of 100-350mm No less than 48 Hours for detention depths < 100mm
K & C* values	Use default values

- **Bioretention (raingardens)**

Bioretention	Acceptable parameter ranges
Extended detention depth	Maximum of 300mm Maximum of 150mm in streetscape raingardens
Unlined filter media perimeter	0.01m (i.e. the systems are lined)
Saturate hydraulic conductivity	Maximum of 100mm/hour
Filter media depth	0.4 – 0.7 m
TN content	800 mg/Kg
Orthophosphate content	40 mg/Kg
Exfiltration rate	zero
Lining	Yes – base is lined
Underdrain present	Yes
K & C* values	Use default values

- **Swales**

Swales	Acceptable parameter ranges
Bed slope	0.5 – 4 %
Vegetation height	Mown turf swales: 50 - 100 mm Native grasses and sedges: 100 - 400 mm
Exfiltration	Zero

- **Tanks**

Tanks	Acceptable parameter ranges
Water source	Only roof water or treated water into reuse tanks
Volume below overflow	User defined
Surface area	Calculate with maximum depth = 1.0m - 2.5m
Initial volume	Same as volume below overflow
Reuse demands	**Irrigation** to be modelled as an Annual Demand Distribution: to be defined with a Monthly pattern which is (Jan-Dec): 13%, 6%, 6%, 4%, 2%, 0%, 4%, 7%, 12%, 14%, 13%, 19%. **Indoor reuse** to be modelled as a daily demand

- **Storage ponds (dams)**

Storage ponds	Acceptable parameter ranges
Water source	Only roof water or treated water into reuse storage ponds
Surface area	User defined
Permanent pool volume	Calculate with depth up to maximum of 3.0m
Initial volume	Same as permanent pool volume
Exfiltration rate	Maximum of 0.01mm/hr
Evaporative loss	Maximum of 100% of PET
Reuse demands	**Irrigation** to be modelled as an Annual Demand Distribution: to be defined with a Monthly pattern which is (Jan-Dec): 13%, 6%, 6%, 4%, 2%, 0%, 4%, 7%, 12%, 14%, 13%, 19%. **Indoor reuse** to be modelled as a daily demand

- **Green roofs**

Green roofs can be modelled as a “lot pervious” urban source node – and this node is included in the MUSIC model provided with the EES ‘MUSIC MODELLING TOOLKIT – WIANAMATTA’.

- **Gross pollutant traps**

Gross Pollutant Traps (GPTs) are primarily designed for removal of litter and debris and some coarse sediment. Generally, GPTs have little impact on nutrient removal because of high through flow rates. For the purpose of MUSIC modelling, GPTs should be reserved for removal of gross pollutants.

Note also that high flow bypasses should be included in the model.

GPTs that have approval removal rates for sediments and/or nutrients by the *Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP)* of Stormwater Australia can apply those approved rates.

- **Proprietary nutrient removal devices**

Removal rates for particular pollutants of such devices is to be consistent with the assessment by the *Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP)* of Stormwater Australia.

- **Infiltration/ porous pavements**

Not permitted without site specific soil capability assessment to demonstrate no adverse impacts of infiltration.

- **Passively watered street trees**

Irrigation of street trees is encouraged for all street trees that are not bioretention street trees or biorerention systems (raingardens). Passively watered street trees operate by diverting small proportions of stormwater via kerb inlet filters to the soil surrounding the trees to increase soil moisture around the tree. Passive irrigation systems divert only small proportions of the total stormwater runoff to the trees and as such as not to be included in MUSIC performance modelling.

End of Submission