

## INSTRUCTIONS FOR ENVIRONMENTAL REVIEW

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| <b>Proposed scheme amendment:</b> | <b>Metropolitan Region Scheme Amendment 1388/57 – Wattle Grove South</b>   |
| <b>Responsible Authority:</b>     | <b>Western Australian Planning Commission</b>  |
| <b>Assessment number:</b>         | <b>2335</b>  |
| <b>Location:</b>                  | <b>Wattle Grove – land bound by Tonkin Highway (west), Welshpool Road East (north), Crystal Brook Road, Victoria Road and Easterbrook Road (east) and the rear boundaries of lots fronting Victoria Road (south)</b> |
| <b>Public review period:</b>      | <b>Environmental Review Document – timing and procedure in accordance with the <i>Planning and Development Act 2005</i></b>  |

### 1. Introduction

Environmental Review (ER) Instructions are provided to the Responsible Authority (RA) to define the scope and content of the ER required by section 48C(1)(a) of the *Environmental Protection Act 1986* (EP Act). These instructions have been prepared by the Environmental Protection Authority (EPA) in consultation with interested agencies.

These instructions are available on the EPA website ([www.epa.wa.gov.au](http://www.epa.wa.gov.au)).

#### **Context**

The EPA has determined that the above amendment to the Metropolitan Region Scheme (MRS) is to be assessed under Part IV of the EP Act because the implementation of the scheme through future development within the proposed urban zoning has the potential to have a significant effect on environmental factors including Inland Waters, Flora and Vegetation, Terrestrial Fauna and Social Surroundings.

#### **Environmental Value**

The amendment is being assessed because the proposed scheme amendment has the potential to have a significant effect on the environmental values within and nearby of the amendment area, including but not limited to:

##### Flora and vegetation

- Vegetation complexes that are poorly represented on the Swan Coastal Plain (SCP)
- Threatened ecological communities (TECs) listed under WA Minister Environmentally Sensitive Areas list in policy and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and WA listed priority ecological communities (PECs)

- Habitat for threatened flora listed under the BC and EPBC Acts and WA listed priority flora.

#### Terrestrial Fauna

- Habitat for threatened fauna listed under the BC and EPBC Acts and WA listed priority fauna.

#### Inland Waters

- Waterways and wetlands of conservation significance, including Yule Brook (Canning River system), the nationally important Greater Brixton Street Wetlands (GBSW), Conservation Category Wetland (CCW) and Resource Enhancement Wetlands (REW) and associated buffers.

#### Social Surroundings

- Aboriginal heritage sites
- Visual amenity associated with the natural and semi-rural character of the area
- Social value of the Greater Brixton Street Wetlands.

The preliminary key environmental factors related to these environmental values which are required to be addressed in the ER are identified in Section 3.

#### ***Procedure***

The EPA requires the RA to undertake the ER according to these instructions.

#### ***Next step in the assessment process***

The next step in the assessment process is the release of the ER. When the EPA is satisfied that the ER document has been prepared in accordance with the instructions, the RA can proceed to advertise the ER and proposed scheme amendment and release the ER and scheme report for a public review period as prescribed by the *Planning and Development Act 2005* (PD Act).

To facilitate adequate public input, the ER document should be made available as widely as possible and at a reasonable cost. The advertising period and process for the scheme amendment and the ER are to be done in accordance with the PD Act.

Appendix 1 of this document describes in detail the process for assessment of planning schemes.

#### ***Scope and Content***

The scope and content of the ER is outlined in sections 2 to 5 of these instructions. The EPA requires the form of the document to be prepared according to the [Environmental Review Document template](#).

#### ***Timing***

Table 1 sets out the timeline for the assessment of the MRS amendment.

**Table 1: Assessment timeline**

| Key assessment milestones  |
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| EPA issues instructions to RA<br><i>(60 days after referral)</i>   |
| RA prepares ER and submits to EPA  |
| EPA authorises advertising of ER and scheme amendment for public review<br><i>(30 days from RA submission of ERD)</i>  |
| RA advertises scheme amendment and ER for public review in accordance with sections 84 and 87(1) of the <i>Planning and Development Act 2005</i>   |
| Close of public review period  |
| RA provides to the EPA copies of submissions regarding environmental issues<br><i>(7 days from close of public review period)</i>  |
| RA provides Response to Submissions to EPA<br><i>(42 days from close of public review period)</i>  |
| EPA reports to the Minister for Environment on environmental factors and recommended scheme conditions<br><i>(60 days after end of public review period or 30 days after receiving RA's Response to Submissions, whichever is longer, but no more than 72 days from the end of the public review period)</i> |

**Assessment by the Commonwealth**

The EPA notes that the MRS amendment, if approved, could allow future proposals (subdivision, development and provision of infrastructure) that may be considered controlled actions under the EPBC Act, depending on whether Matters of National Environmental Significance (MNES) are adequately protected by the finalised scheme amendment. In general, planning scheme amendments are not considered 'actions' under the EPBC Act (refer section 523) and are not subject to assessment by the Commonwealth. The RA should consider Commonwealth advice and guidance documents in relation to the relevant MNES.

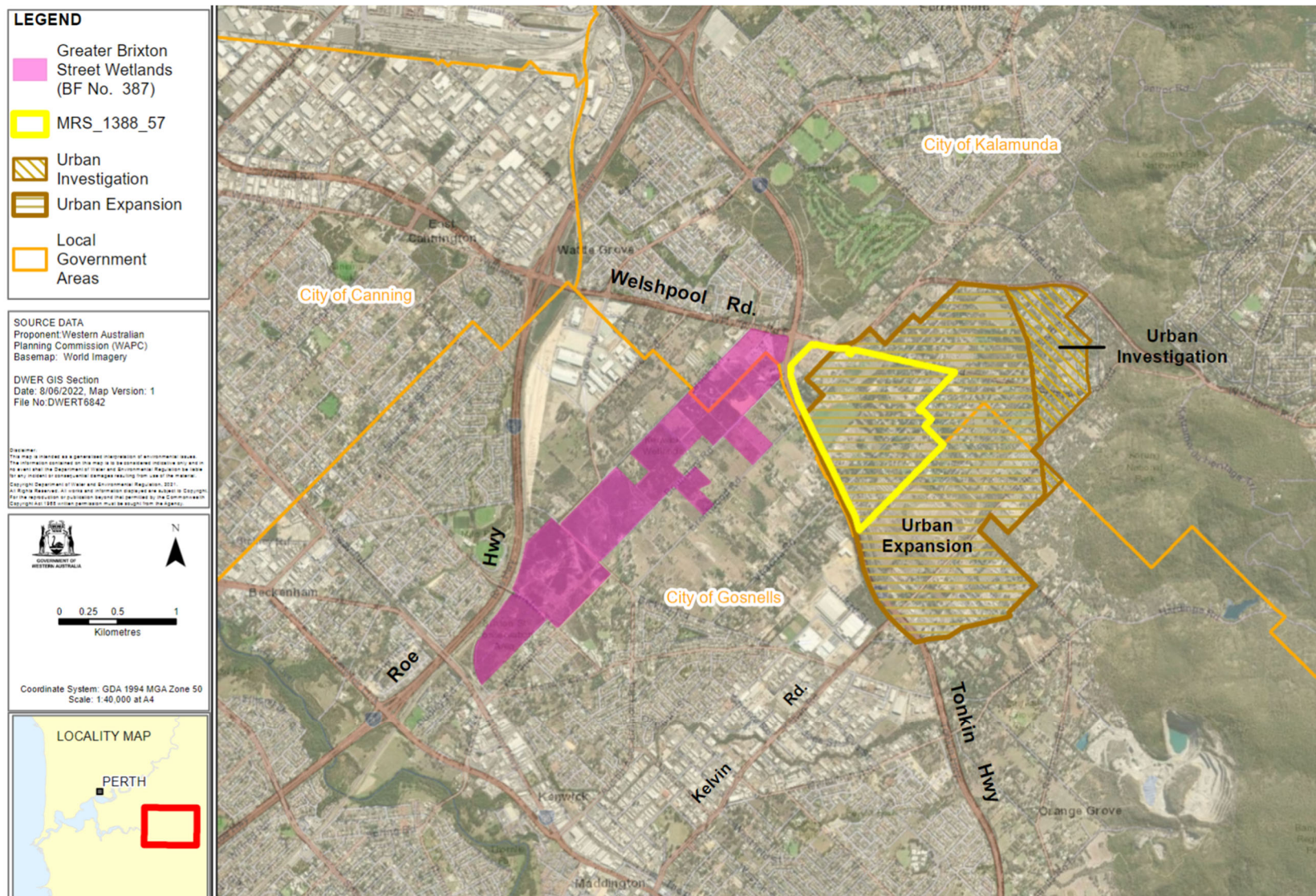
**2. The scheme amendment**

The subject of these instructions is MRS Amendment 1388/57, which proposes to transfer approximately 123.5 hectares (ha) of land in Wattle Grove from the 'Rural' zone to the 'Urban' zone. The amendment area is located to the southeast of the intersection of Tonkin Highway and Welshpool Road East / Crystal Brook Road and affects about 80 lots approximately 1-5 ha in size. The location of the proposed MRS amendment and proposed zoning is shown in Figures 1 and 2, and a summary of the MRS amendment is set out in Table 2.

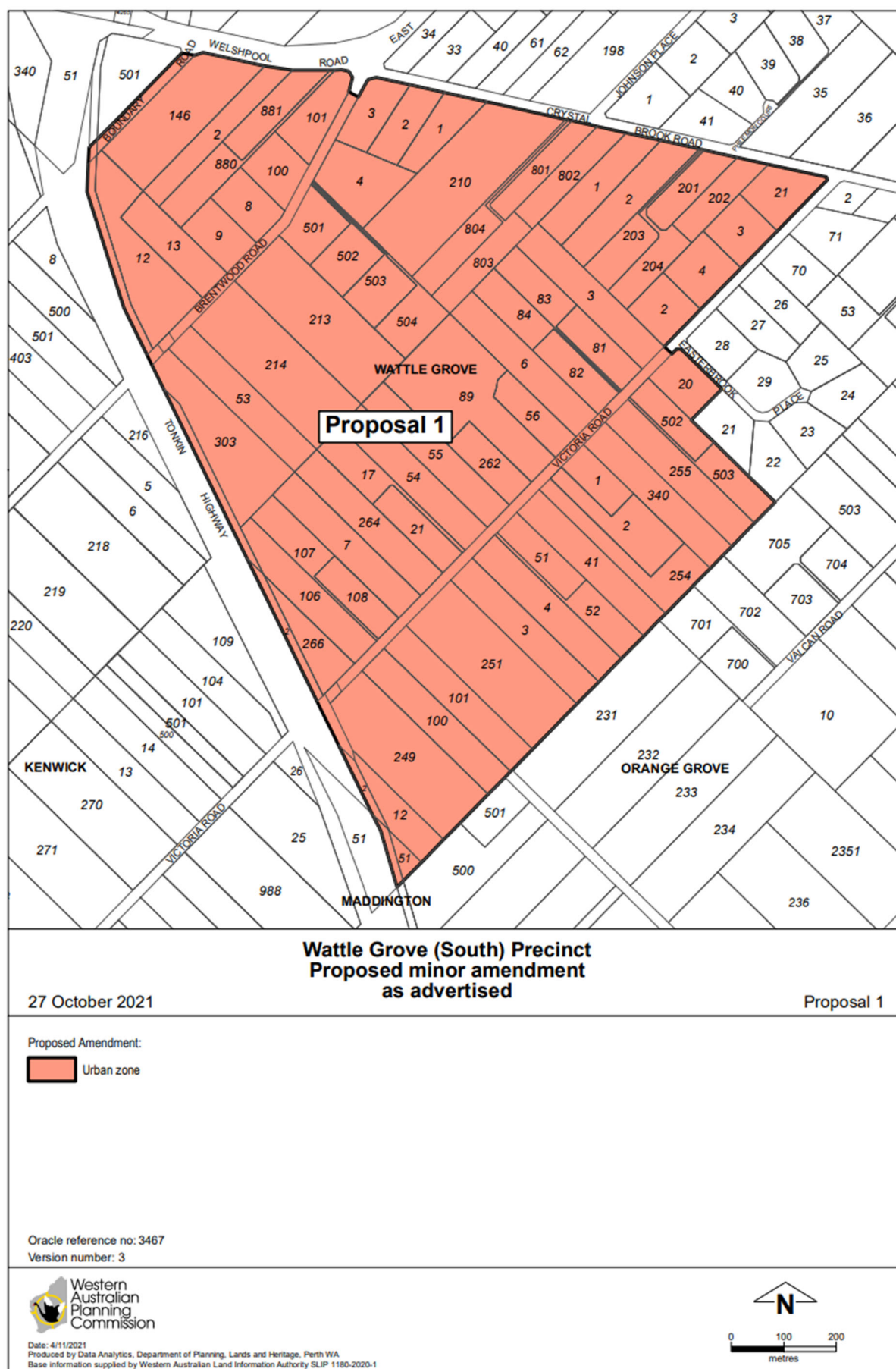
**Table 2: Summary of the scheme amendment**

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| <b>Scheme amendment title</b> | MRS Amendment 1388/57 - Wattle Grove South |
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| <b>RA name</b>           | Western Australian Planning Commission (WAPC)   |
| <b>Location</b>          | Land generally bound by Tonkin Highway (west), Welshpool Road East (north), Crystal Brook Road, Victoria Road and Easterbrook Road (east) and the rear boundaries of lots fronting Victoria Road (south) in Wattle Grove                      |
| <b>Short description</b> | The amendment seeks to transfer approximately 123.5 ha of land in Wattle Grove from the 'Rural' zone to the 'Urban' zone under the MRS, to allow for future subdivision, development and use of land for residential and associated purposes. |



**Figure 1: Location of MRS Amendment 1388/57 and broader Wattle Grove urban expansion and urban investigation area, and the nearby Greater Brixton Street Wetlands**



**Figure 2: Proposed zoning for MRS 1388/57 land (Source: WAPC)**

### 3. Preliminary key environmental factors and required work

The preliminary key environmental factors for the environmental review are:

1. Inland Waters;
2. Flora and Vegetation;
3. Terrestrial Fauna;
4. Social Surroundings, and
5. Greenhouse Gas.

Table 3 outlines the work required for each preliminary key environmental factor and contains the following elements for each factor:

- **EPA factor** and **EPA objective** for that factor.
- **Relevant activities** – the development activities that may have a significant impact on that factor.
- **Potential impacts and risks** to that factor.
- **Required work** for that factor.
- **Relevant policy and guidance** – EPA (and other) guidance and policy relevant to the assessment.

**Table 3 Preliminary key environmental factors and required work**

| Inland Waters                      |   |
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| <b>EPA objective</b>               | To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.   |
| <b>Relevant activities</b>         | <ul style="list-style-type: none"> <li>• Clearing of vegetation and alteration of natural drainage regimes for future development and associated infrastructure.</li> </ul>   |
| <b>Potential impacts and risks</b> | <ul style="list-style-type: none"> <li>• Impacts to current surface and ground water cycles (alteration of hydrological regimes) resulting in impacts to significant wetlands and waterways within and nearby to the amendment area, including the Yule Brook and Greater Brixton Street Wetlands (GBSW).</li> <li>• Impacts to water quantity and quality of significant wetlands and waterways within and nearby to the amendment area.</li> <li>• Impact to the hydrology and biodiversity of the GBSW.</li> <li>• Loss of foreshore functions and groundwater and/or surface water dependent vegetation and impacts to other water dependent ecosystems.</li> </ul> |
| <b>Required Work</b>               | <ol style="list-style-type: none"> <li>1. Identify and assess the values and significance of hydrological and geological characteristics within the amendment area and surrounding area including for the broader Wattle Grove Urban Expansion and</li> </ol>   |

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|  | <p>Urban Investigation area, particularly in relation to the GBSW, and describe these values in a local and regional context.</p> <ol style="list-style-type: none"><li>2. Identify and map wetlands and watercourses within and adjacent to the amendment area including urban expansion and urban investigation areas and through work from the instructions below identify any areas proposed to be impacted.</li><li>3. Map groundwater contours for the regional and perched groundwater tables over the amendment area using site specific monitoring data and monitoring data from other nearby bores including the Department of Water and Environmental Regulation (DWER) and Department of Biodiversity Conservation and Attractions (DBCA) sites to establish the groundwater flow direction. Assess results in comparison to previous regional mapping completed within the local area (amendment area, urban expansion and investigation areas). Liaise with DWER to obtain any monitoring data further to the publicly available data base. Additional long-term and extensive groundwater flow direction investigations (such as additional monitoring bores and an extended period of data collection) may be required to support groundwater flow mapping that is not consistent with the DWER mapping. Ensure that all superficial bores used in creating the regional groundwater contours are not perched, and represent the groundwater in superficial aquifer.</li><li>4. Map the surface water catchment for the amendment, urban expansion and urban investigation areas, and map the contribution of pre development surface water flows to the surrounding wetlands and water courses.</li><li>5. Describe the total water cycle for the amendment area in the context of it being within the Yule Brook Catchment and with consideration of the surrounding urban expansion and urban investigation area. Discuss the hydrology and hydrogeology, particularly as it relates to wetland and ecological diversity within and nearby to the amendment area. Include information and discussion on the water budget for the area, the existing drainage management practices and any known impacts on the wetlands and waterways in, and nearby to the amendment area.</li><li>6. Using a pre and post development water balance model, characterise the existing hydrology of the site and existing sub surface flow contribution to the GBSW; and assess the potential impacts (direct and indirect) of the proposed change in land use associated with the amendment, and urban expansion and investigation areas, on water quantity and quality of surface and ground waters and subsurface flow contribution in relation to nearby significant wetlands and waterways<br/>The following should be considered in the development of any model:<ul style="list-style-type: none"><li>• The model should be developed in consultation with DWER and DBCA and consider inputs of the PRAMS groundwater flow model inputs.</li></ul></li></ol> |
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|  | <ul style="list-style-type: none"> <li>• Provide details of the existing geological and hydrogeological conditions used in conceptualising any modelling undertaken.</li> <li>• The groundwater water balance and groundwater resources in the Superficial aquifer should consider PRAMS input parameters using the flow-net analysis with the Darcy equation. Groundwater throughflow from the site toward the GBSW should be calculated with consideration of the Darcy equation.</li> <li>• Demonstrate the water balance is based on an understanding of both the groundwater minimum and maximum for the amendment area and the GBSW. The assessment of soil/sediment gravimetric and volumetric water contents, where perched aquifers are suspected, is also required to adequately inform the water balance.</li> <li>• Minimum data and information required to support an appropriate water balance is listed below with accompanying published data. <ul style="list-style-type: none"> <li>– Minimum groundwater levels (collected April-May) – as shown in the published data logger data presented in WA wetlands conference poster (Bourke et. al. 2018).</li> <li>– Groundwater levels (minimum and maximum) presented in metres below ground level – required to assess wetland flora and fauna and terrestrial vegetation groundwater dependency and threats (e.g. waterlogging, acidification and salinisation). Lambers (2019).</li> <li>– Volumetric water content, water retention and hydraulic conductivity – see Davis and Cahill (2018) for horizontal hydraulic conductivity calculations using surface nuclear magnetic resonance (SNMR).</li> <li>– Water quality within GBSW is known to be spatially varying (Davis and Cahill 2018, and Lambers 2019). A spatial, temporal and lithological interpretation of water quality data is therefore required against water balance modelling outcomes to assess threats to wetland flora and fauna and terrestrial vegetation.</li> </ul> </li> </ul> <p>7. Calculate the additional recharge from the proposed change in land use associated with the amendment, and the resultant impact to the groundwater flow velocity and direction toward the GBSW. This should also include identification of the additional recharge from the urban expansion and investigation areas.</p> <p>8. Demonstrate that predevelopment surface water and groundwater flows to the Yule Brook and GBSW are maintained post development as a result of the proposed change in land use associated with this amendment, and urban expansion and investigation areas.</p> |
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|  | <ol style="list-style-type: none"> <li>9. Estimate post development nutrient input and export rates resulting from the proposed change in land use, including through the use of DWER's Urban Nutrient Decision Outcomes (UNDO) model.</li> <li>10. Predict the extent, severity and duration of potential impacts further to items 5 to 9, including changes to local and regional groundwater flows and levels, drawdown, local water quality and impacts to other groundwater users as a result of the proposed change in land use associated with the Amendment, and urban expansion and investigation areas, and provide measures to mitigate these impacts.</li> <li>11. Determine the boundaries of wetlands and/or buffer requirements to wetlands within and adjacent to the amendment area proposed to be retained. Boundary and buffer studies should consider the characteristics of hydrology, hydric soils and wetland vegetation, and the water balance of the wetland/wetland dependent vegetation.</li> <li>12. In the context of the below, items 6, 8 and 11 should model existing conditions of, and potential changes to, groundwater and surface water chemistry, particularly in relation to salinity and soil sodicity, that will result from the proposed change in land use associated with this amendment, and urban expansion and investigation areas.<br/><br/> <p>Research in the southern area of the GBSW has shown the area is characterised by aquifers with locally elevated salinities and a water table that fluctuates from at or above the surface, to below ground level and there may be a risk from the provision of more groundwater or surface water to the GBSW, as this may persist into summer months and concentrate solutes in the root zone as it evaporates.</p> </li> <li>13. Describe how the principles of water sensitive urban design will be incorporated and implemented in the amendment area, consistent with the <i>Better Urban Water Management</i> framework (WAPC, 2008) and the Stormwater Management Manual for Western Australia (DWER 2004-2007) and other relevant guidelines.</li> <li>14. Detail and discuss how future drainage practices within the site, is to be managed, considering the broader catchment. This management should ensure the hydrological balance and water quality of significant wetlands and watercourses within and nearby to the amendment area (such as the GBSW and Yule Brook) will be maintained.</li> <li>15. Describe how drainage management practices could be adapted in the future to mitigate impacts of climate change on significant wetlands and waterways, within and adjacent to the amendment areas.</li> <li>16. Using the mitigation hierarchy, detail and discuss how development activities will avoid and manage mobilisation of potentially poor-quality groundwater resulting from past agricultural land uses.</li> </ol> |
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|                                     | <p>17. Describe the planning or other mechanisms that will ensure drainage management will protect significant wetlands and watercourses within and adjacent to the amendment area.</p> <p>18. Describe the ongoing management requirements for the amendment area to ensure the hydrology of significant wetlands and watercourses within and nearby to the amendment area is maintained.</p> <p>19. Prepare a district water management strategy in accordance with the Guidelines for district water management strategies (DoW, 2013).</p> <p>20. Prepare a monitoring program including management objectives, baseline conditions, public reporting and measures to be implemented in the event of non-compliance to management objectives.</p> <p>21. Based on the outcomes of the above and taking into consideration the principles of avoidance and minimisation, identify an environmentally acceptable area for development.</p> <p>22. Provide a summary of residual impacts of future development and associated infrastructure within and adjacent to the amendment areas.</p> <p>23. Describe any proposed avoidance, mitigation and management measures that demonstrate the EPA's objectives can be met.</p> <p>24. Describe the planning mechanisms that are to be applied to ensure impacts are managed to meet the EPA's objectives.</p> |
| <b>Relevant policy and guidance</b> | <p><b><i>EPA Policy and Guidance</i></b></p> <p><i>Statement of Environmental Principles, Factors, Objectives and Aims of EIA</i>, EPA, 2021.</p> <p><i>Environmental Factor Guideline – Inland Waters</i>, EPA, June 2018.</p> <p><b><i>Other policy and guidance</i></b></p> <p><i>Better Urban Water Management</i>, Western Australian Planning Commission, October 2008.</p> <p>Bourke L, Brown K, Paczkowska G. Characterising the condition and function of the Greater Brixton Street Wetlands, Kenwick, Western Australia, to inform conservation management. Poster presented at the 14th Annual WA Wetland Management Conference 2018, 2nd February, Bibra Lake, WA.</p> <p>Davis, Aaron; Cahill, Kevin. Surface nuclear magnetic resonance soundings in the Greater Brixton Street Wetlands. Perth, WA: CSIRO; 2018.</p> <p>Davis, Aaron; Cahill, Kevin. Ground-based time-domain electromagnetic soundings in Greater Brixton Street Wetlands. Perth, WA: CSIRO; 2018.</p> <p>Department of Biodiversity, Conservation and Attractions, A methodology for the evaluation of wetlands on the Swan Coastal Plain, Western Australia, 2017.</p>   |

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|  | <p><i>Guideline for the determination of wetland buffer requirement, Draft, Department of Planning and Infrastructure, 2005.</i></p> <p><i>Stormwater Management Manual for Western Australia (DWER 2004-2007).</i></p> <p><i>Guidelines for district water management strategies DoW, 2013.</i></p> <p><i>Identification and investigation of acid sulphate soils and acidic landscapes, Department of Environment Regulation, June 2015.</i></p> <p>Lambers . Introduction and overview. In: Lambers H ed. A jewel in the crown of a global biodiversity hotspot. Perth: Kwongan Foundation and the Western Australian Naturalists' Club In, 2019</p> <p><i>Operational policy 4.3: Identifying and establishing waterways foreshore areas, Department of Water, September 2012.</i></p> <p><i>Treatment and management of soil and water in acid sulphate soil landscapes, Department of Environment Regulation, June 2015</i></p> <p><i>Environment Protection and Biodiversity Conservation Act 1999 and approved conservation advices on relevant MNES.</i></p> |
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| Flora and Vegetation               |  |
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| <b>EPA objective</b>               | To protect flora and vegetation so that biological diversity and ecological integrity are maintained.  |
| <b>Relevant activities</b>         | Clearing of vegetation, addition of fill, and alteration of natural drainage regimes for future development and associated infrastructure.   |
| <b>Potential impacts and risks</b> | <p>Direct and indirect loss of significant flora and vegetation, including threatened and priority ecological communities, threatened and priority flora, and vegetation complexes poorly represented in existing conservation reserves (Guildford Complex and Forrestfield and Southern River Complex).</p> <p>Potential impacts include:</p> <ul style="list-style-type: none"> <li>• Direct loss through clearing,</li> <li>• Loss of fauna habitat (vegetation loss) short and long term,</li> <li>• Impacts to wetland and riparian vegetation and ground water dependant ecosystems within and nearby to the amendment area (including GBSW) through changes to hydrology,</li> <li>• Spread or intensification of weeds and <i>Phytophthora</i> dieback,</li> <li>• Fragmentation.</li> </ul> |
| <b>Required work</b>               | 25. Identify and characterise the flora and vegetation present and likely to be present within the amendment area, in accordance with EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment, December 2016. For existing flora and vegetation  |

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|  | <p>surveys completed for the amendment area, demonstrate (provide justification) how surveys are relevant, representative and demonstrate consistency with current EPA policy and guidance set out below.</p> <p>Include a summary of survey findings for the amendment area and an analysis of the significance of flora and vegetation in local and regional context in accordance with relevant EPA guidelines.</p> <p>Note: Ensure species database searches and taxonomic identifications are current. IBSA data packages should be provided in accordance with EPA guidance.</p> <p>26. For lots within the amendment which are accessible, TEC identification and analysis to be undertaken in accordance with the most current version of Methods for survey and identification of Western Australian threatened ecological communities. Draft for consultation, currently Version 3: 14 April 2022.</p> <ol style="list-style-type: none"> <li>Individual quadrat data should be analysed to determine the FCT present using single site insertions against the Gibson et al. (1994) and Keighery et al. (2012 - Bush Forever) datasets, to minimise disruption.</li> <li>A combination of methods including cluster, nearest neighbours and similarity indices are also advised. Critical analysis of the logic of the outcomes of analysis is then required.</li> <li>The typical broad habitat features such as soil and landform, and hydrological status of quadrats established for Gibson et al. (1994) should also be explicitly discussed and compared in reporting.</li> </ol> <p>27. Provide maps depicting the survey effort (for existing and any future surveys) in relation to the amendment area, recorded locations of significant flora, ecological communities, and vegetation in relation to the amendment area in accordance with the relevant guidelines set out below. Clearly show any areas unable to be surveyed and indicate likelihood of occurrence of TECs and threatened and priority flora within these areas. Ensure species database searches and taxonomic identifications are up to date. Provide vegetation condition mapping.</p> <p>28. Identify and assess the potential direct, indirect and cumulative impacts of future development on the identified environmental values. Include a quantitative assessment of levels of impact on significant flora, listed ecological communities and all vegetation units. Describe and assess the extent of any cumulative impacts within local and regional contexts as appropriate. Provide a map(s) depicting areas of flora and vegetation detailing communities (including Floristic Community Type), units, and quality, to be retained and protected. Determine the ecological water requirements of; and identify buffers to significant vegetation.</p> <p>29. Provide a quantitative assessment of impact:</p> |
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|                                     | <p>For significant flora, this includes:</p> <ul style="list-style-type: none"> <li>• number of individuals and populations in a local and regional context;</li> <li>• numbers and proportions of individuals and populations directly or potentially indirectly impacted, and</li> <li>• numbers/proportions/populations currently protected within the conservation estate (where known).</li> </ul> <p>For all vegetation units (noting threatened and priority ecological communities and significant vegetation) this includes:</p> <ul style="list-style-type: none"> <li>• area (in hectares) and proportions directly or potentially indirectly impacted, and</li> <li>• proportions/hectares of the vegetation unit currently protected within conservation estate (where known).</li> </ul> <p>30. Describe the planning or other mechanisms that will ensure vegetation identified for retention will be protected.</p> <p>31. Describe the ongoing management requirements to ensure retained areas of vegetation within the amendment area are managed appropriately and identify which planning or other mechanisms are required to ensure this management is implemented.</p> <p>32. Describe the ongoing management requirements for the amendment area, and broader urban expansion and investigation area, which would ensure the hydrological requirements of vegetation within the amendment and nearby (including GBSW) is maintained, and what planning or other mechanisms are required to ensure this management.</p> <p>33. Describe any proposed avoidance, mitigation and management measures that demonstrate the EPA's objectives can be met.</p> <p>34. Identify, describe, and quantify the potential residual impacts (direct, indirect, and cumulative) that may occur after considering and applying the mitigation hierarchy.</p> <p>35. Based on the components of the amendment, determine and quantify any significant residual impacts by applying the Residual Impact Significance Model (page 11) and WA Offset Template (Appendix 1) in the <i>WA Environmental Offsets Guidelines</i> (2014). Where significant residual impacts remain, propose an appropriate offsets strategy. Spatial data defining the area of significant residual impacts for each environmental value should be provided (e.g. vegetation type, vegetation condition, specific fauna species habitat.).</p> <p>36. Describe the planning mechanisms that are to be applied to ensure impacts are managed to meet the EPA's objectives.</p> |
| <b>Relevant policy and guidance</b> | <p><b><i>EPA Policy and Guidance</i></b></p> <p><i>Statement of Environmental Principles, Factors, Objectives and Aims of EIA</i>, EPA, 2021</p>   |

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|  | <p><i>Environmental Factor Guideline – Flora and vegetation</i>, EPA, December 2016</p> <p><i>Technical Guidance: Flora and vegetation surveys for environmental impact assessment</i>, EPA, June 2020.</p> <p><i>Instructions and Form: IBSA Data Packages</i>, EPA, November 2021</p> <p><b>Other policy and guidance</b></p> <p><i>State Planning Policy 2.8: Bushland Policy for the Perth Metropolitan Region</i></p> <p><i>Environment Protection and Biodiversity Conservation Act 1999 and approved conservation advices on any relevant MNES</i></p> <p>DoEE Survey guidelines for Australia's threatened species: various<br/>Guidelines for surveying for species listed as threatened under the EPBC Act</p> |
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| Terrestrial Fauna                  |  |
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| <b>EPA objective</b>               | To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.   |
| <b>Relevant activities</b>         | <ul style="list-style-type: none"> <li>• Clearing of fauna habitat and addition of fill for future development and associated infrastructure.</li> <li>• Movement of machinery and vehicles.</li> <li>• Increased presence of artificial light, noise and human activity.</li> </ul>   |
| <b>Potential impacts and risks</b> | <ul style="list-style-type: none"> <li>• Loss of significant fauna habitat including black cockatoo habitat - breeding, roosting and foraging.</li> <li>• Direct or indirect impacts or loss of other significant fauna and fauna habitat found to be present during survey.</li> <li>• Fragmentation of fauna habitat and loss of ecological connectivity.</li> <li>• Degradation of fauna habitat and habitat modification from introduction and increased spread of weeds and/or disease, altered surface water flows, altered groundwater and edge effects.</li> <li>• Fauna mortality as a result of construction activities.</li> <li>• Disturbance to waterbirds (including migratory species) from impacts to wetlands.</li> <li>• Altered fauna behavior due to noise, lighting and human presence.</li> <li>• Change in feral animal abundance and/or movement.</li> </ul> |
| <b>Details of required work</b>    | 37. In accordance with the requirements of EPA guidance conduct a desktop study to identify and characterise the fauna and fauna habitats for the amendment area to inform local and regional context. Based on the results of the desktop study undertake the appropriate level survey and habitat assessment.  |

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|  | <p>This should include survey/assessment within the amendment area and consideration of cumulative impacts. For identified significant (Threatened and Priority) fauna, this must include information on:</p> <ul style="list-style-type: none"> <li>a. the abundance, distribution, ecology, and habitat preferences, together with baseline information and mapping of local and regional occurrences.</li> <li>b. population size and importance of the population from a local and regional perspective; and</li> <li>c. information on conservation value of each habitat type (e.g. breeding, migration, feeding, roosting etc.) from a local and regional perspective, including the percentage representation of each habitat site in relation to its local and regional extent.</li> </ul> <p>Note: Surveys should include both Terrestrial Vertebrate Fauna and Short-range Endemic (and/or other significant) Invertebrate Fauna. Survey design should ensure that adequate local and regional contextual data are collected and should consider cumulative impacts. If multiple surveys have been undertaken to support the assessment, a consolidated report should be provided including the integrated results of the surveys. Where surveys were undertaken at the referral stage, survey results and a demonstration of how the guidance has been followed are to be included in the ER. Ensure species database searches and taxonomic identifications are current. IBSA data packages should be provided in accordance with EPA guidance. Ensure species database searches and taxonomic identifications are up to date.</p> <p>38. Provide a map of the survey effort applied in relation the fauna habitat, the study area and amendment area illustrating the known recorded locations of conservation significant species, other significant fauna and fauna habitat in relation to the amendment area. Clearly show any areas/lots unable to be surveyed. Mapping should also identify the direct and indirect impact areas.</p> <p>39. Identify and describe the characteristics of the fauna and fauna habitat that may be impacted directly and indirectly by the amendment, development and provision of associated infrastructure and describe the significance of these values in a local and regional context. Describe significant habitats, including but not limited to: refugia, breeding areas, key foraging habitat, movement corridors and linkages. Habitats that are important to significant species, and the reasons for their importance, should be identified. Discussions of habitats should quantify the absolute and relative areas of the habitats in question, and that these discussions should be supported by tables and figures that illustrate the extents of habitats.</p> <p>40. Identify significant fauna and describe in detail their known ecology, likelihood of occurrence, habitats, and known threats. Map the</p> |
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|                                     | <p>locations of significant fauna records in relation to the fauna habitats, the study area, the scheme amendment area, and potential direct, indirect, and cumulative impact areas.</p> <p>41. Provide a map depicting areas of fauna habitat to be retained and protected from future subdivision, development and provision of associated infrastructure.</p> <p>42. Detail, map and quantify areas of fauna habitat not proposed to be retained.</p> <p>43. Describe and assess the extent of direct and indirect impacts as a result of the proposed change in land use associated with the amendment to terrestrial fauna taking into consideration cumulative impacts and the significance of fauna and fauna habitat. This should include an assessment of the risk posed to any significant species as a result of future development and associated infrastructure. For significant species, this should be done on a species-by-species basis. Significant species discussed should include short-range endemic and other significant invertebrates.</p> <p>Note: The likelihood of SRE fauna occurring within a given development area should be considered early in the environmental scoping stage. Preliminary SRE fauna risk assessments can then be used to set the context for a given assessment and as a reasoned basis to identify the extent of any surveys required.</p> <p>44. Apply the mitigation hierarchy and describe any proposed avoidance, mitigation and management measures that demonstrate the EPA's objectives can be met.</p> <p>45. Identify, describe and quantify the potential residual impacts (direct, indirect and cumulative) to fauna assemblages, habitats and significant species, that may occur following implementation of the amendment after considering and applying avoidance and minimisation measures, in a local and regional context.</p> <p>46. Based on the components of the amendment, determine and quantify any significant residual impacts by applying the Residual Impact Significance Model (page 11) and WA Offset Template (Appendix 1) in the <i>WA Environmental Offsets Guidelines</i> (2014). Where significant residual impacts remain, propose an appropriate offsets strategy.</p> <p>47. Describe the planning mechanisms that are to be applied to ensure impacts are managed to meet the EPA's objectives.</p> |
| <b>Relevant policy and guidance</b> | <p><b><i>EPA Policy and Guidance</i></b></p> <p><i>Statement of Environmental Principles, Factors, Objectives and Aims of EIA</i>, EPA, 2021</p> <p><i>Environmental Factor Guideline – Terrestrial Fauna</i>, EPA, December 2016</p>  |

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|  | <p><i>Technical Guidance: Sampling methods for terrestrial vertebrate fauna</i>, EPA, December 2016</p> <p><i>Technical Guidance: Terrestrial fauna surveys</i>, EPA, December 2016</p> <p><i>Technical Guidance: Sampling of short range endemic invertebrate fauna</i>, EPA, December 2016</p> <p><i>Instructions and Form: IBSA Data Packages</i>, EPA, November 2021</p> <p><b>Other policy and guidance</b></p> <p><i>Environment Protection and Biodiversity Conservation Act 1999</i></p> <p>Relevant recovery plans, conservation advices and/or threat abatement plans for conservation significant species that are known to occur, or are likely to occur in the vicinity of the amendment area.</p> <p>DoEE Survey guidelines for Australia's threatened species: various Guidelines for surveying for species listed as threatened under the EPBC Act</p> |
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| Social Surroundings                |   |
|------------------------------------|---|
| <b>EPA objective</b>               | To protect social surroundings from significant harm.   |
| <b>Relevant activities</b>         | <ul style="list-style-type: none"> <li>• Clearing of vegetation and site works and provision of associated infrastructure.</li> <li>• Physical presence of future development and associated infrastructure.</li> </ul>   |
| <b>Potential impacts and risks</b> | <ul style="list-style-type: none"> <li>• Disturbance to Aboriginal heritage places and/or cultural association within the area.</li> <li>• Changes to environment which may impact on Aboriginal heritage places.</li> <li>• Impacts to the natural, social and historical heritage values of the GBSW.</li> <li>• Impacts to the visual amenity associated with the natural and semi-rural character of the area.</li> </ul>   |
| <b>Required work</b>               | <p>48. Characterise the heritage and cultural values within the amendment area to identify sites of significance and their relevance within a wider regional context.</p> <p>49. Conduct appropriate consultation with Traditional Owners to identify areas of significance and any concerns in regard to environmental impacts as they affect heritage and cultural matters.</p> <p>50. Provide a description and figure(s) of the heritage and cultural values and proposed direct and indirect impacts within and adjacent to the amendment area (including the GBSW).</p> |

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|                                     | <p>51. Assess the direct and indirect impacts on known heritage sites, values and/or cultural associations, associated with the changes in land use which may impact on cultural and heritage significance (including the GBSW).</p> <p>52. Predict the residual impacts on heritage sites, values and/or cultural associations, for direct, indirect and cumulative impacts after consideration of the mitigation hierarchy.</p> <p>53. Outline the mitigation and management measures to ensure impacts to heritage site, values and /or cultural association (direct and indirect) are minimised, and not greater than predicted.</p> <p>54. Identify and discuss the potential visual amenity impact from the change in land use on residents within and adjacent to the amendment area, and broader area.</p> <p>55. Describe the planning mechanisms that are to be applied to ensure impacts are managed to meet the EPA's objectives.</p> |
| <b>Relevant policy and guidance</b> | <p><i>Statement of Environmental Principles, Factors, Objectives and Aims of EIA</i>, EPA, 2021</p> <p><i>Environmental Factor Guideline – Social Surroundings</i>, EPA, December 2016</p> <p><u>Other policy and guidance</u></p> <p>Department of Aboriginal Affairs and Department of Premier and Cabinet, Due Diligence Guidelines, Version 3.0. Perth, Western Australia, 2013.</p> <p>Western Australian Planning Commission, 2007, Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design.</p>   |

| Greenhouse Gas                     |   |
|------------------------------------|---|
| <b>EPA objective</b>               | To reduce net greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change.  |
| <b>Relevant activities</b>         | <ul style="list-style-type: none"> <li>Clearing of vegetation for future development.</li> </ul>  |
| <b>Potential impacts and risks</b> | <ul style="list-style-type: none"> <li>Greenhouse gas emissions through clearing and decomposition of vegetation.</li> </ul>  |
| <b>Required work</b>               | <p>56. Estimate the expected Scope 1 (direct) and Scope 2 (indirect) net greenhouse gas emissions (i.e. quantity of carbon dioxide equivalent (CO<sub>2</sub>-e)) on an annual basis and over the life of the scheme amendment inclusive of changes to land use (clearing of vegetation). Breakdown estimated emissions by source (e.g. changes to land use, clearing of vegetation). Detail the methods used to estimate the net greenhouse gas emissions.</p> |

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|                                     | <p>57. Describe the considered and proposed mitigations that demonstrate all reasonable and practicable measures have been applied at each step of the mitigation hierarchy to avoid, reduce and/or offset greenhouse gas emissions over the life of the scheme amendment.</p> <p>58. Where scope 1 emissions are estimated to exceed 100,000 tonnes per equivalent per annum, develop a Greenhouse Gas Management Plan in accordance with the EPA's <i>Environmental Factor Guideline: Greenhouse Gas Emissions</i> and demonstrate how the EPA's objective for this factor can be met.</p> |
| <b>Relevant policy and guidance</b> | <p><i>Statement of Environmental Principles, Factors, Objectives and Aims of EIA</i>, EPA, 2021.</p> <p><i>Environmental Factor Guideline – Greenhouse Gas Emissions</i>, EPA, April 2020.</p>   |

These preliminary key environmental factors must be addressed within the ER for the public to consider the impacts of the implementation of the scheme amendment, and proposed management, and make comment to the EPA. All technical reports, modelling and referenced documents (not currently in the public domain) used in the preparation of the ER document should be included as appendices to the document. Documents used in the preparation of the ER must not contain disclaimers that preclude their public availability.

The EPA anticipates addressing these factors in its assessment report to the Minister for the Environment.

#### 4. Other environmental factors or matters

It is important that the responsible authority be aware that other factors or matters may be identified during the course of the ER that were not apparent at the time that these instructions were prepared. If this situation arises, the responsible authority must consult with the EPA to determine whether these factors and/or matters are to be addressed in the ER, and if so, to what extent.

#### 5. Relevant Ministers and interested agencies

At this stage, the EPA has identified the Minister and agencies listed in Table 4 as being either the Responsible Minister or a Minister or agency concerned with the outcome of the scheme amendment. Additional Ministers and agencies may be identified during the course of the assessment.

**Table 4 Relevant Ministers and interested agencies**

| Minister/agency       | Interest  |
|-----------------------|---|
| Minister for Planning | Responsible Minister - <i>Environmental Protection Act 1986</i> section 48F - Minister's agreement on the conditions. |

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|  | <i>Planning and Development Act 2005 - Approval of Amendment</i>                      |
| Minister for Environment                                 | <i>Environmental Protection Act 1986.<br/>Biodiversity and Conservation Act 2016.</i> |
| Minister for Water                                       | <i>Rights in Water and Irrigation Act 1914.</i>                                       |
| Minister for Aboriginal Affairs                          | <i>Aboriginal Heritage Act 1972/ Aboriginal Cultural Heritage Act 2021</i>            |
| City of Kalamunda  | <i>Planning and Development Act 2005.</i>   |
| Department of Biodiversity, Conservation and Attractions | Presence of significant fauna and flora.  |
| Department of Water and Environmental Regulation         | Part V of the <i>Environmental Protection Act 1986</i>                                |
| Water Corporation  | Yule Brook Main Drain   |
| Department of Planning Lands and Heritage                | <i>Planning and Development Act 2005.</i>   |