PRELIMINARY DOCUMENTATION RESPONSE

Citiswich – Stage 7

4 November 2024

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LIST OF APPENDICES

PREAMBLE

The following Preliminary Documentation response report (PD Report) has been prepared by Litoria Consulting in response to additional information requested by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) as part of a controlled action decision made on 18 March 2022 for the Citiswich development, (EPBC 2021/9112).

The delegate of the Minister for the Environment considers that the proposed action is likely to have a significant impact on the following matters protected by the *Environment Protection and Biodiversity Conservation Act 1999*:

- Listed threatened species and communities (sections 18 and 18A).

As per Attachment A and B of the request for additional information, a cross-reference table below lists the information requested with the corresponding section in this report. Although the report is intended to be read in the order it has been presented, the reference table displays where to find information in the order in which it was requested by DCCEEW. Other supporting material has been included in the Appendices.

In accordance with Section 95A(3) of the EPBC Act, the following information for assessment on preliminary documentation was published to allow for public consultation:

- Preliminary Documentation Response (Litoria Consulting, v5.5a, 5 August 2024),
- Offset Management Plan (Litoria Consulting, v5.5c, 9 August 2024),
- Preliminary Documentation Appendices (Litoria Consulting, v5.5, 29 July 2024), and
- An invitation for public comment.

The published notice inviting public comments was placed in the Courier Mail and Local Ipswich News. Hard copies and electronic copies of the information were available for viewing between 29 August 2024 and 12 September 2024, during which time, no comments / submissions were received.

Attachment A

1. General content, format and style

The preliminary documentation must:		
No.	Request	Location
1.1	Include a reference table indicating where to find the information fulfilling this request.	This table will indicate where the information is provided throughout the Preliminary Documentation to fulfil the request.
1.2	Contain sufficient information to allow the Minister (or delegate) to make an informed decision on whether or not to approve, under Part 9 of the EPBC Act, the taking of the action for each controlling provision. Contain sufficient information to enable interested stakeholders to understand the environmental consequences of the proposed development on matters of national environmental significance (MNES).	Detailed information is contained throughout the document as per the request.
1.3	Ensure all work and conclusions: a) are presented clearly, unambiguously, succinctly and objectively. b) are evidence based, and the evidence is provided. c) are supported by peer reviewed literature, with references provided, or expert opinion. d) use scientifically robust methodologies appropriate to the purpose, and describe and appropriately reference the methodology/s chosen, e) detail why the methodology/s was selected and state any limitations in the chosen approach. f) are, where appropriate, supported by maps, plans, diagrams or other descriptive detail. g) demonstrate consideration of relevant documents* including Approved Listing Advice(s), Conservation Advice(s), Recovery Plan(s), Threat Abatement Plan(s) or comparable policy guidelines, and approved survey methods. h) appropriately reference all sources using the Harvard standard. The reference list must include the address of any internet pages used as data sources.	Items 1.3 a) through h) have been understood and applied throughout the document.
1.4	Must avoid passive language and use active, clear commitments (e.g., 'must' and 'will') where appropriate.	Item 1.4 has been understood and applied throughout the document.

The preliminary documentation must:		
No.	Request	Location
1.5	Be able to read as a stand-alone document and must include summaries of all relevant information further explained in appendices. Detailed technical information, studies or investigations necessary to support the main text should be attached as appendices to the main document.	The document is stand-alone and supported with summaries of previous reporting, technical information and the Offset Management Plan in the appendices.
Note	*Please note the department may require further information, in addition to the information required below, should new information come to light during the assessment stage (e.g. an additional species has been identified onsite).*	Acknowledged.

2. Description of the action

If not previously provided in the referral documentation, the preliminary documentation must include:		
No.	Request	Location
2.1	a) a description of all components of the proposed action (pre-construction, construction and operational), including the anticipated start and completion dates and duration. This should include a detailed outline of the expected timing of any staged clearing over the construction period. b) the location, boundaries, and size (in hectares) of the disturbance footprint, and of adjoining areas and vegetation, which may be indirectly impacted by the proposal, including from material stockpiles, vehicle access and associated activities. c) a clear description of any material changes (e.g. total footprint, areas to be cleared) or planning changes (e.g. construction timeframes) between the referral and draft preliminary documentation submissions. d) details of any local, State or Federal Government planning scheme, or plan or policy under any local, State or Federal Government planning system that applies to the proposed action, or that the proponent reasonably believes are likely to apply, to the proposed action. Details should include: a. what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy; and b. obtained approvals or additional approvals that are required.	a) Start and finish dates are identified in Section 3: Description of the Action (pg.33). Further information about pre-construction, construction and operational activities can be found in Section 7: Impact identification (pg. 71). b) The proposed action (including the disturbance footprint) is identified in Section 3.1: Proposed Action (pg.33), Figure 5. The rationale for the configuration of the disturbance footprint can be found in Section. 3.2: Design & operational considerations (pg.35). Adjoining vegetation is described and shown in Section 5.6: Surrounding Landscape (pg.57). c) Material changes are discussed in Section 3.3: Material changes since the referral (pg.40). d) Details of relevant planning schemes and existing approvals are identified in Section 4: Approval (pg.42).

If not previously provided in the referral documentation, the preliminary documentation must include:		
No.	Request	Location
2.2	Further information is required as follows: a) a description with supporting figures detailing all site access roads and any other shared infrastructure to be constructed to facilitate the proposed action. b) proposed measures to reduce threats posed by domestic pets to native wildlife on and adjacent to the site. c) mapped locations and size of any proposed fire breaks, and details of any proposed new or updated fire management plans as a result of the proposed action. d) information about proposed fencing, including: a. the location of all proposed fencing. b. the characteristics of the fencing, i.e. height, length, wildlife proof measures etc. i. whether the proposed fencing will provide a wildlife barrier to/from/within the proposed action area. ii. please support with maps, plans, diagrams whenever possible.	a) Access, shared infrastructure and information on minor infrastructure proposed in the open space are addressed in Section 3.2: Design & Operational Considerations (pg. 35). b) Not applicable due to industrial land use and industrial site context. c) The implications of the bushfire assessment are described in Section 3.2.7: Bushfire (pg. 39). d) The proposed fencing design is discussed in Section 3.2.6: Fencing (pg. 39). Avoidance, mitigation and management measures relevant to fencing and the GHFF can be found in Section 9.2: Supplementary Measures (pg. 95), specifically, Table 12.

3. Description of the environment and Matters of National Environmental Significance

If not previously provided in the referral documentation, the preliminary documentation must include:		
No.	Request	Location
3.1	A description of any potential Matters of National Environmental Significance (MNES) (including but not limited to those listed in this request for information) that occur in the project area and adjacent areas.	MNES are discussed in Section 6: Matters of National Environmental Significance (pg.61). A likelihood assessment of MNES can be found in Appendix 9. MNES relevant to the site are discussed in detail in the MNES report (Litoria Consulting, February 2023) (Appendix 2).
3.2	For listed threatened species and ecological communities that have the potential, or are likely, to be present at and in the vicinity of the project site, including but not limited to	An assessment of the likelihood of occurrence of MNES is discussed in Section 6: Matters of National Environmental Significance (pg. 61). A likelihood assessment of MNES

If not previously provided in the referral documentation, the preliminary documentation must include:		
No.	Request	Location
	those listed in this request for further information, this section must provide a likelihood of occurrence assessment based on the following: a) Information on the abundance, distribution, ecology and habitat preference of the species or communities. b) Quantification of the extent of habitat (including maps identifying known or potential habitat). c) Assessment of the quality and importance of known or potential habitat for the species or communities within the proposed action site and surrounding areas. d) Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations. e) Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g., dates, time of day, season, etc.) and search effort (e.g. 20 hours over eight days). f) An assessment of the adequacy of any surveys undertaken with reference to any relevant scientific literature and/or statutory documents. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines. g) Results of any surveys undertaken. *Please note: Survey data should be as recent as possible and collected in the last five years. If adequate surveys of the project site to confirm the presence/absence of the above listed threatened species and ecological communities are not undertaken, the department considers that, for the purposes of assessment under the EPBC Act, it may be appropriate to assume that those listed species and ecological communities are present at the proposed site.*	can be found in Appendix 9. The methods and results are discussed in detail in the MNES report (Litoria Consulting, February 2023) (Appendix 2) More detailed information on the potential habitat for the Grey-headed Flying-fox on site and in the surrounding landscape, including the methods and results of the assessment, can be found in Section 6.2: Further Assessment of the Grey-headed Flying-fox (pg.62). Details of the survey undertaken, including season, effort, and time, as well as the assessment of the adequacy of the survey are contained in Section 4.1: Site Assessment (pg. 42).

4. Impact Assessment

If not previously provided in the referral documentation, the preliminary documentation must include:		
No.	Request	Location
4.1	Provide a description of the intended land uses proposed as part of the completed development, including of any proposed open space and/or conservation areas and associated ongoing activities, and details of the intended party that would be responsible for future management activities.	The intended land use of the completed development is described in Section 3.2.5: Open Space Areas (pg. 38). Refer to Appendix 7: Andrew Gold Landscape Architecture Plan (31/07/23) which displays and describes open space treatment areas.
4.2	Include current maps and coordinates/shapefile of the proposed impact area and areas of habitat for MNES proposed to be retained. Maps must clearly identify development footprints, buffer zones, and any conservation areas where impacts will be avoided, and areas of adjacent habitat that would be subject to indirect impacts, including areas that are to be retained within and adjacent to the site.	Current maps of the extent of the proposed action (impact area) are contained in Section 3.1: Proposed Action (pg.33). A description of the habitat impacted and retained as a result of the proposed action is contained in Section 8: Significant Impact Assessment (pg. 87), specifically, Table 9 and Figure 22. Identification of edge effects and connectivity is contained in Section 7.2.1: Edge Effects (pg. 78).
4.3	Confirm the area of habitat that will be directly and indirectly impacted by the proposed action, including but not limited to areas where: a) Connectivity to surrounding habitat will be retained, removed or functionally lost. b) Adjacent habitat will be subject to intensification of ongoing impacts (for example, through increased human and vehicle presence).	Identification of edge effects and connectivity are contained in Section 7.2.1: Edge Effects (pg. 78). Direct and indirect impacts of the development, including those impacts on adjacent vegetation, are discussed in Section 7: Impact Identification (pg. 71), which include an assessment of duration, frequency, area, severity and likelihood of impacts arising from pre-construction, construction and post-construction activities.
4.4	Confirm the quantity and quality of suitable habitat to be impacted within the proposed action area.	Quality of habitat to relevant MNES is assessed in Section 6.2.2.1: Habitat Assessment (pg.63), and Section

If not previously provided in the referral documentation, the preliminary documentation must include:		
No.	Request	Location
		6.2.2.4: Assessment of habitat critical to the survival of the species (pg.69). Current maps of the extent of the proposed action (impact area) are contained in Section 3.1: Proposed Action (pg. 33). Further descriptions of habitat impacted and retained as a result of the proposed action are contained in Section 8: Significant Impact Assessment (pg. 87), specifically, Table 9 and Figure 22.
4.5	Details of any policy guidelines, relevant studies, surveys, or consultations with species experts/field specialists, which were not included in the referral or additional information provided in support of the referral.	A further assessment of MNES that was not included in the MNES report is contained in Section 6.2: Further Assessment of the Grey-headed Flying-fox (pg.62). An updated likelihood assessment including justification of decision making for all MNES is also included in Appendix 9.
4.6	Provide an assessment of the direct and indirect impacts that may occur during construction and post-construction phases, including: a) The nature and extent of impacts (including direct, indirect* and facilitated impacts**), including timing and whether the impact is temporary or permanent. This must include the quality of the habitat impacted, a quantification of the total individuals/populations and habitat area in hectares and analysis of the indirect impacts such as fragmentation of the habitat in the proposed action area and surrounding areas. Consideration must be given to species habitat such as hollow bearing trees, nest trees, refuge habitat, foraging and breeding habitat, sheltering or other microhabitat features relevant to the species within and surrounding the development footprint (if applicable). b) A local and regional scale analysis of likely impacts, with reference to the project's potential contribution to cumulative impacts in the context of development patterns in the locality and region.	For information on habitat types and features per the results of field investigations refer to Section 5: Existing Environment (pg. 45). Identification and assessment of the nature and extent of impacts, duration of impacts, and likelihood of repeated impacts that may occur as a result of the development is contained in Section 7: Impact Identification (pg.71). This includes assessment of edge effects, vehicles, earthworks, and other disturbances such as light and noise. Assessment of impacts on relevant MNES at local and regional scales has been assessed against the significant

If not previously provided in the referral documentation, the preliminary documentation must include:		
No.	Request	Location
	c) An assessment of the likely duration of impacts to MNES as a result of the proposed action. d) An assessment of whether impacts are likely to be repeated, for example as part of maintenance. e) Discussion of the risk of potential impacts as a result of the proposed action, including but not limited to the following: a. Edge effects – including the potential for the introduction of weed species and pathogens in the referral area and adjacent environment. b. Vehicle movement – potential increase of vehicles to strike fauna in the pre-construction, construction, and operation phase of the project c. Increased presence of dogs – pre-construction, construction and operation phases have the potential to increase dog presence in the referral area and adjacent environment. d. Earthworks – potential to generate dust emissions from the removal of vegetation and movement of soil in the pre-construction and construction phase of the project. e. Disturbance from increased noise, artificial light, sediment generation and other relevant stressors during construction and operation of the residential development. **Note: Please review the following policy statement, providing guidance on what impacts constitute a 'indirect consequence(s)', under paragraph 527E(1)(b) of the EPBC Act.* ***Note: Facilitated impacts may include (but are not limited to) the risk of injury or mortality to MNES as a result of the introduction of domestic dogs in a residential area, vehicle strike as a result of increased residential car use and/or the development of domestic pools.*	impact guidelines in Section 8: Significant Impact Assessment (pg.87).

5. Avoidance, mitigation and management measures

To clarify the proposed measures to avoid and mitigate impacts, the preliminary documentation must:		
No.	Request	Location
5.1	Provide a consolidated assessment of all proposed measures to avoid and mitigate impacts, including those provided in the referral and any additional to those described in the referral. This should include: a) An outline of: a. all reasonable efforts that have been made to avoid impacts to MNES: and b. any remaining impacts to be mitigated to reduce the impacts on MNES. b) The viability and effectiveness of alternative strategies, plans and measures to avoid and mitigate impacts, and why the chosen avoidance and mitigation measures were more appropriate. Including but not limited to: a. avoidance of the removal of mature habitat trees on site. b. avoidance of direct impacts to the retained vegetation on site. c) All proposed measures and outcomes of the avoidance and mitigation measures must be clearly listed, and follow the specific, measurable, achievable, relevant and timely (SMART) principle. d) Provide an assessment of the predicted effectiveness of each proposed avoidance or mitigation measure, noting that the effectiveness of a particular measure is a reflection of confidence in the nominated outcome. The assessment of effectiveness should be evidence based and include examples of demonstrated success of a particular measure to achieve the desired avoidance/mitigation outcome. e) A description (including maps and imagery) of the location, boundaries and size of buffer areas or proposed exclusion zones, and details on how these areas will be enhanced, protected, and maintained. Also include a description of any fences or barriers which may be installed around areas where impacts will be avoided. f) Details of any ongoing mitigation and management measures during the operation of the facility, including but not limited to: a. Details about pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease. b. Information on any buffer zones between the construction footprint and remaining habitat in the referral area and adjacent to the site.	Design considerations, including avoidance and mitigation, can be found in Section 3.2: Design & Operational Considerations (pg. 35). Information on buffer zones and the development configuration are contained in Section 7.2.1: Edge Effects (pg. 78) A consolidated assessment of all proposed measures to avoid and mitigate impacts including expected effectiveness can be found in Section 9: Management Measures (pg.94), in particular, Table 12: Avoidance, Mitigation and Management Measures for Relevant MNES. This includes information on pre-clearance procedures and post-construction operational procedures.

To clarify the proposed measures to avoid and mitigate impacts, the preliminary documentation must:		
No.	Request	Location
5.2	For each measure proposed, indicate the: a) impact to be avoided and/or mitigated b) responsible party c) environmental outcomes to be achieved d) milestones / performance / completion criteria e) an evidence-based likelihood of success/risk assessment f) proposed monitoring and evaluation program. g) contingency measures.	A consolidated assessment of all proposed measures to avoid and mitigate impacts including expected effectiveness can be found in Section 9: Management Measures (pg.94), in particular, Table 12: Avoidance, Mitigation and Management Measures for Relevant MNES
5.3	Any statutory or policy basis for the proposed measures, including reference to the SPRAT Database and relevant approved conservation advice, recovery plan or threat abatement plan, and a discussion on how the proposed measures are not inconsistent with relevant plans. (For example, the National Recovery Plan for the Grey-Headed Flying Fox states an objective to: *'to improve the Grey-headed Flying-foxes national population trend by reducing the impact of the threats outlined in this plan on Grey-headed Flying-foxes through habitat identification, protection, restoration and monitoring'* Please provide a discussion on how the proposed action is consistent with relevant species' objectives or alternatively, how the proposed avoidance, mitigation/management and offsetting will compensate for any residual significant impact, thereby ensuring consistency with the objective for relevant EPBC Act species.	A consolidated assessment of all proposed measures to avoid and mitigate impacts including expected effectiveness can be found in Section 9: Management Measures (pg.94), in particular Table 12: Avoidance, Mitigation and Management Measures for Relevant MNES Section 8: Significant Impact Assessment (pg.87) explores the impacts of the development and the proposed avoidance and mitigation measures in regard to statutory documents for the GHFF.

6. Proposed offsets

If a residual significant impact is identified, the preliminary documentation must include an offset proposal, which must:		
No.	Request	Location
6.1	Demonstrate how the offset proposal: a) meets the principles outlined in the EPBC Environmental Offsets Policy.	Refer to Section 14.3.2.3: Statutory Requirements (pg. 143) for an assessment against the EPBC Environmental Offset Policy.

If a residual significant impact is identified, the preliminary documentation must include an offset proposal, which must:		
No.	Request	Location
	b) addresses the considerations and requirements outlined in the EPBC Environmental Offsets Policy, including but not limited to sections 6 and 7 of the EPBC Environmental Offsets Policy. c) directly contributes to the ongoing viability of the EPBC listed species or ecological community and will deliver an overall conservation outcome that improves or maintains the viability of the protected matter, as compared to what is likely to have occurred under the status quo, i.e., if neither the action nor the offset had taken place. d) compensates for the impact over the entire duration of the impact (i.e., should impacts be in perpetuity, the offsets must also be delivered in perpetuity). Details and execution timing of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide enduring protection for the potential offset area/s against development incompatible with conservation. For further details regarding offset requirements, see Attachment B.	Refer to Section 14.5:C (pg. 149) for information regarding the conservation outcome. Refer to Section 14.3.2: Results (of the offset assessment) (pg. 143) for information on how the offset compensates for 100% of the proposed impacts. Refer to Section 14.6: Legally Secured Offset Area for information regarding the timing and legal mechanism to secure the offset site in perpetuity.

7. Habitat Quality Assessment

Part seven (7) of the Request for Additional Information for assessment by Preliminary Documentation provides recommendations for the habitat quality assessment approach.	
Recommendation	Response
A methodology that is suitable for each listed threatened species or threatened ecological community (i.e., approved by the department or supported by literature) where there is a residual significant impact must be used to assess habitat quality, noting the same scoring mechanism must be used at both impact and offset sites.	A method was developed that is specific and suitable to the GHFF using Department guidance material at the request of the Department (August 29, 2022). The method has been reviewed frequently by the Department prior to lodgement. In-principal approval for most of the proposed methodology was provided by the Department on January 17, 2023, and additional changes were reviewed with the Department on November 8, 2023.

Part seven (7) of the Request for Additional Information for assessment by Preliminary Documentation provides recommendations for the habitat quality assessment approach.	
Recommendation	Response
The department currently prefers the use of the Modified Habitat Quality Assessment (MHQA) tool to provide a habitat quality score for the prescribed matters. Please consult the department if an alternative approach is proposed. The MHQA tool derives habitat quality scores using an adaptation of the Queensland Government's 'Guide to Determining Terrestrial Habitat Quality version 1.2 (DEHP Guide). The MHQA method was developed with the intention to better reflect the requirements of the EPBC Act Environmental Offsets Policy for determining habitat quality.	As recommended, the Modified Habitat Quality Assessment (MHQA) was utilised to determine a habitat quality score. The MHQA was adapted to reflect habitat values pertinent to the GHFF at the request of the Department (August 29, 2022). Changes were made as aligned with the information in the SPRAT database and relevant departmental documents, substantiated with appropriate field surveys in accordance with the relevant survey guidelines.
A copy of the DEHP Guide, an MHQA scoring guide and an MHQA scoring spreadsheet template is attached. When calculating offsets, please refer to the department's published guidance: How to use the Offsets Assessment Guide.	As recommended, the Offsets Assessment Guide (version number 1.04.00), and guidance material *How to Use to Offsets Assessment Guide* were utilised in the assessment.
If you propose a habitat quality gain of more than 2 points or an achieved habitat quality score of 9 or 10, it becomes less certain that the conservation outcome can be achieved. Justification of the effectiveness of your proposed management measures and associated habitat quality score improvements must be supported by substantial evidence.	Neither a habitat quality gain of more than two points nor a final habitat quality score of 9 or 10 is proposed.
If you wish to propose an alternative methodology for habitat quality assessment for any/all of the prescribed matters, the methodology used to provide the quality score for an area of habitat must: • relate directly to habitat requirements of the species as aligned with the information in the SPRAT database and relevant departmental documents. • be substantiated with appropriate field surveys in accordance with the relevant survey guidelines or using a scientifically robust and repeatable methodology. • be applied per listed threatened species or threatened ecological community likely to experience a significant residual impact as a result of the proposed action.	A method was developed that is specific and suitable to the GHFF using Department guidance material at the request of the Department (August 29, 2022). As recommended, the Modified Habitat Quality Assessment (MHQA) was utilised to determine a habitat quality score. The MHQA was adapted to reflect habitat values pertinent to the GHFF at the request of the Department (August 29, 2022). Changes were made as aligned with the information in the SPRAT database and relevant departmental documents, substantiated with appropriate

Part seven (7) of the Request for Additional Information for assessment by Preliminary Documentation provides recommendations for the habitat quality assessment approach.	
Recommendation	Response
Where there is any variation or un-substantiation of the habitat assessment approach from the information available in the SPRAT database, it should be discussed with the department prior to the submission of the assessment documentation and must be supported by scientific evidence including published research, independent expert advice and information derived from field surveys.	field surveys in accordance with the relevant survey guidelines. The method has been reviewed frequently by the Department prior to lodgement. In-principal approval for most of the proposed methodology was provided by the Department on January 17, 2023, and additional changes were reviewed with the Department on November 8, 2023.

8. Economic and Social Matters

If not previously provided in the referral documentation, the preliminary documentation must:		
No.	Request	Location
8.1	Provide details on the social and economic costs and/or benefits of undertaking the proposed action, including the basis for any estimations of costs and/or benefits. Where possible, please include the total economic capital investment and economic ongoing value of the project.	Economic costs and/or benefits of undertaking the proposed action are described in Section 12.1: Economic & Social Matters (pg.106).
8.2	Identify if economic benefits and employment opportunities are in addition to what would have been expected if the action were not to take place.	Economic benefits and employment opportunities of undertaking the proposed action are described in Section 12.1: Economic & Social Matters (pg.106).
8.3	Provide details of any public stakeholder consultation activities, including the outcomes of those consultations.	Public Stakeholder engagement is discussed in Section 12.1: Economic & Social Matters (pg.106).
8.4	Provide details of any consultation with Indigenous stakeholders. Identify existing or potential native title rights and interests, including any areas and objects that are of particular significance to Indigenous peoples and communities, possibly impacted by the proposed action and the potential for managing those impacts.	Indigenous engagement is discussed in Section 12.2.2: Indigenous Engagement (pg.107).

If not previously provided in the referral documentation, the preliminary documentation must:		
No.	Request	Location
	Describe any Indigenous consultation that has been undertaken, or will be undertaken, in relation to the proposed action and its outcomes. This should include: a) details regarding the specific Indigenous groups and Traditional Owners consulted and an indication of the areas, both tangible and intangible, of cultural significance across the project site; and b) a discussion about how impacts to areas and/or objects of Indigenous cultural significance (tangible and intangible) are avoided, mitigated or minimised. The department considers that best practice consultation, in accordance with the Guidance for proponents on best practice Indigenous engagement for environmental assessments under the EPBC Act (2016) includes: a) identifying and acknowledging all relevant affected Indigenous peoples and communities; b) committing to early engagement; c) building trust through early and ongoing communication for the duration of the project, including approvals, implementation and future management; d) setting appropriate timeframes for consultation; and e) demonstrating cultural awareness. Describe any state requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action with regard to Indigenous peoples and communities.	

9. Ecologically Sustainable Development

If not previously provided in the referral documentation, the preliminary documentation must:		
No.	Request	Location
9.1	Provide a description of how the proposed action meets the principles of ecologically sustainable development, as defined in section 3A of the EPBC Act, which are as follows: (a) decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations, (b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation, (c) the principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations, and (d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.	An assessment of the development against the principles of Ecological Sustainable Development as detailed in the request can be found in Section 11: Ecologically Sustainable Development (pg.104).

10. Environmental Record of the Person Proposing to Undertake the Action

Include details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:		
No.	Request	Location
10.1	The person proposing to take the action;	A description of the environmental record of the person proposing to undertake the action as detailed in the request can be found in Section 13: Person Undertaking the Action (pg.109).
10.2	For an action for which the person has applied for a permit, the person making the application;	
10.3	If the person is a body corporate – the history of its executive officers in relation to environmental matters; and	
10.4	If the person is a body corporate that is a subsidiary of another body or company (the parent body) – the history in relation to environmental matters of the parent body and its executive officers.	

11. Ecological data provision

Include details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:		
No.	Request	Location
11	The preliminary documentation must include an appendix of occurrence records (both sightings and evidence of presence) for all listed threatened and migratory species identified during field surveys for the proposed action. This data may be used by the department to update the relevant species distribution models that underpin the publicly available Protected Matters Search Tool (PMST). The species occurrence records must be provided in accordance with the department's Guidelines for biological survey and mapped data (2018) using the species observation data template provided with this request for additional information. Sensitive ecological data must be identified and treated in accordance with the department's Sensitive Ecological Data – Access and Management Policy V1.0 (2016) or subsequent revision.	Species observation data of occurrence records for all listed threatened and migratory species identified during field surveys are located in Appendix 9.

Attachment B

IMPORTANT: Some location references in the following table refer to the Offset Management Plan contained in Appendix 1.

Details in relation to the draft Offset Management Plan, including:		
No.	Request	Location
B1	A description of the proposed offset site(s) including location, size, condition, and relevant ecological/species values present and surrounding land uses.	The requested information is contained Section 14.2: Offset Site Description.
B2	Maps and shapefiles to clearly define the location and boundaries of the offset area/s, accompanied by the offset attributes (e.g., physical address of the offset area/s, coordinates of the boundary points in decimal degrees, the relevant MNES that the environmental offset/s	Shapefiles of the Offset Area are included as an attachment as part of this submission to DCCEEW. The size, location, boundaries and coordinates of the Offset Area are contained in Section 14.4: Proposed Offset. Information about the physical attributes of the site and the relationship with the target MNES is

Details in relation to the draft Offset Management Plan, including:		
No.	Request	Location
	compensates for, and the size of the environmental offset/s in hectares).	contained in Section 14.2: Offset Site Description, and Section 14.3.2: Results (of the Offset Assessment).
B3	Baseline survey information to provide evidence of relevant MNES presence and the extent and quality of the respective habitat(s) at the proposed offset site(s) in accordance with the relevant survey guidelines or using a scientifically robust and repeatable methodology.	The requested information is contained in Section 14.2.3: Grey-headed Flying-fox Habitat, and Section 14.3: Offset Assessment.
B4	Summarised details of the nature of the conservation gain to be achieved for relevant MNES, including the creation, restoration and revegetation of habitat in the proposed offset area/s.	The requested information is contained in Section 14.5: Conservation Outcome.
B5	An assessment with supporting evidence, of how the environmental offset/s meets the requirements of the department's EPBC Act Environmental Offsets Policy (2012) (Offsets Policy), available at: www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy	The requested information is contained under Section 14.3.2.3: Statutory Requirements, specifically Table 18.
B6	Information about how the proposed offset area/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant MNES. This should include information about how the proposed offset/s area contributes to any state and/or regional plan/s for the conservation of the protected matter.	The requested information is contained under Section 14.3.2.3: Statutory Requirements, specifically Table 17, and Section 14.3.3: Summary (of the Offset Assessment).
B7	How the offset area/s are like-for-like, i.e., the environmental values of the offset are of the same type or equivalent to that affected by the proposed action.	The requested information is contained under Section 14.3.2.3: Statutory Requirements, specifically Table 17; and Section 14.3.3: Summary (of the Offset Assessment).
B8	Current and likely future tenure of the proposed offset site and details of how the offset site will be legally secured for the full duration of the impact.	The requested information is contained in Section 14.6: Legally Secured Offset Area.

Details in relation to the draft Offset Management Plan, including:		
No.	Request	Location
B9	The methodology, with justification and supporting evidence, used to inform the inputs of the Offsets assessment guide in relation to the offset site/s for each relevant MNES, including: a) total area of habitat (in hectares); b) habitat quality (using a consistent methodology as agreed with the department in section 8 of the Preliminary documentation - request for further information).	The requested information is contained in Section 14.3: Offset Assessment.
B10	The methodology, with justification and supporting evidence, used to inform the inputs of the Offsets assessment guide in relation to each potential offset area for each relevant MNES, including: • time over which loss is averted (max. 20 years); • time until ecological benefit; • risk of loss (%) without offset; • risk of loss (%) with offset; • confidence in result (%).	The requested information is contained in Section 14.3.1.2: Offsets Assessment Guide, specifically Table 16.
B11	Specific, measurable, achievable, relevant and timely (SMART) offset completion criteria (i.e., environmental outcomes) to be achieved, and reasoning for these in reference to relevant statutory recovery plans, conservation advice, and threat abatement plans (e.g., within 15 years of commencement of the action, there is an average of X amount of Koala habitat trees per ha. The department notes that if an offset is deemed to provide suitable compensation for the impacts of the proposed action, the offset completion criteria provided may be used to inform outcomes-based conditions of approval.	The requested information is contained in Appendix 1: Offset Management Plan, Section 8: Offset Completion Criteria.

Details in relation to the draft Offset Management Plan, including:		
No.	Request	Location
B12	Interim milestones to demonstrate adequate progress towards achieving the environmental outcomes/completion criteria (e.g., within 10 years of commencement of the action the proponent must increase, by at least 20 per cent, the number of available Koala food trees at the offset site).	The requested information is contained in Appendix 1: Offset Management Plan, Section 8: Offset Completion Criteria, specifically, Section 8.4: Interim Targets.
B13	Details of the environmental management and threat mitigation activities that will attain and maintain the completion criteria.	The requested information is contained in Appendix 1: Offset Management Plan, Section 9: Risk Assessment and Section 10: Management Actions.
B14	Risk analysis and a risk management and mitigation strategy for all risks to the successful implementation of the OAMP and timely achievement of the offset completion criteria, including a rating of all initial and post-mitigation residual risks in accordance with a risk assessment matrix.	The requested information is contained in Appendix 1: Offset Management Plan, Section 9: Risk Assessment.
B15	A monitoring program to measure the progress towards the interim milestones and environmental outcomes/completion criteria.	The requested information is contained in Appendix 1: Offset Management Plan, Section 10: Management Actions and Section 11: Monitoring and Reporting.
B16	Proposed timing for the submission of monitoring reports which provide evidence demonstrating whether the interim milestones have been achieved.	The requested information is contained in Appendix 1: Offset Management Plan, Section 11: Monitoring and Reporting.
B17	Timing for the implementation of tangible, on-ground corrective actions to be implemented if monitoring activities indicate the interim milestones have not been achieved.	The requested information is contained in Appendix 1: Offset Management Plan, Section 11: Monitoring and Reporting, and Section 13: Adaptive Management Plan and Review.

1 INTRODUCTION

This Preliminary Documentation response report (PD Report) has been prepared by Litoria Consulting on behalf of Walker Bremer Park Pty Ltd for the Citiswich Estate commercial development located at Warrego Highway, Bundamba, Queensland. The Citiswich Estate development is comprised of seven (7) stages, of which the subject of the report is Stage 7 (Lot 13 SP 238272, Lot 34 SP 326668, and Lot 2 RP 104683), also referred to as 'the site'. A rectified aerial image of the site is presented in Figure 1.

This PD Report has been prepared as part of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) referral (EPBC 2021/9112). It is to be read in conjunction with the Offset Delivery Plan (ODP) (Appendix 1) and expands on the information provided at the referral in the Matters of National Environmental Significance Report (MNES Report) (Appendix 2).

On 18 March 2022, a delegate of the Minister decided that the Citiswich Stage 7 proposed action was a controlled action to be assessed by Preliminary Documentation (under sections 75 and 87 of the EPBC Act) for likely significant impacts on threatened species, including the Grey-headed Flying-fox (*Pteropus poliocephalus*) (GHFF). The purpose of this Preliminary Documentation (PD) report is to:

- Identify and discuss the above Matters of National Environmental Significance (MNES) that are within or surrounding the development area (i.e., the undeveloped land);
- Provide management measures to avoid, minimise and mitigate impacts on MNES; and,
- Assess the potential impacts on the above MNES to determine if the proposed action will result in a significant impact.

This PD report is based on qualitative and quantitative evidence to support the assessment of significant impacts on identified MNES.

In preparing this assessment, we have:

- Identified and assessed habitat for the Grey-headed Flying-fox (GHFF) by:
    - Conducting a literature review of Department resources and published research to discuss habitat preferences for the species;
    - Conducting desktop searches of relevant databases and mapping;
    - Reviewing historical, on-ground ecological surveys for the development area, which were undertaken in accordance with Commonwealth-approved survey guidelines;
    - Assessing the type and quality of habitat with supporting figures.
- Identified the impacts associated with the proposed development by:
    - Reviewing the scope and activities (pre-construction, construction and post-construction) associated with the proposed action;

    - Identifying potential direct and indirect impacts associated with the proposed action;
    - Assessing the likely duration and timing of impacts;
- Assessed whether the proposed action will have a significant impact on the MNES by assessing the impacts against the relevant Significant Impact Guidelines.
- Outlined management measures by:
    - Reviewing avoidance, mitigation and management actions.

The assessment is supported by scaled maps and plans that clearly show the extent of the proposed action in relation to MNES.

The report is divided into the following sections:

- Background,
- Description of the action,
- Previous assessment and approvals,
- Existing environment
- Matters of national environmental significance,
- Impact identification,
- Significant impact assessment,
- Management measures,
- Residual significant impact,
- Ecologically sustainable development,
- Other matters,
- The person undertaking the action,
- Offset proposal, and
- Executive Summary.

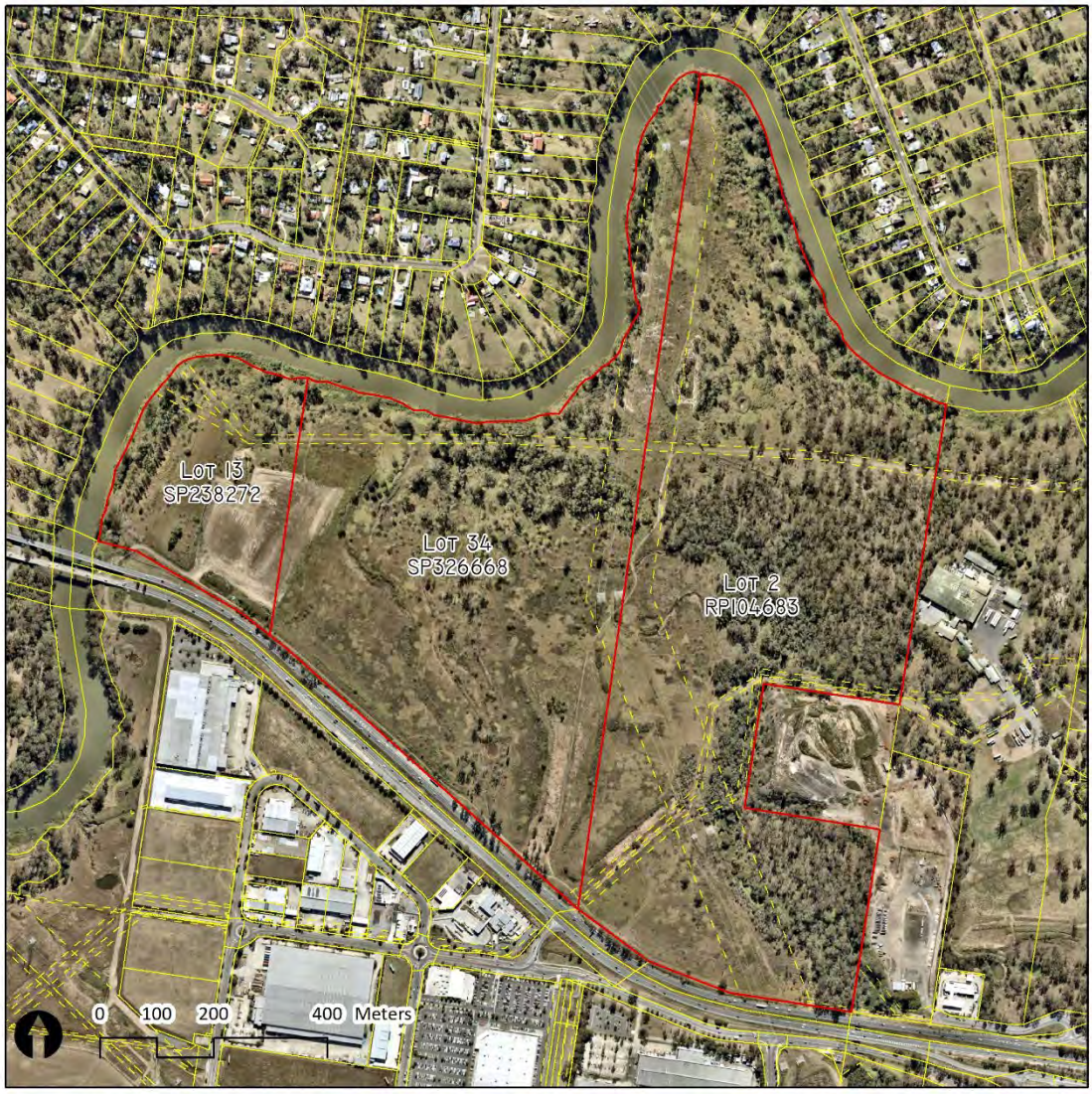


FIGURE 1: RECTIFIED DIGITAL AERIAL PHOTOGRAPH OF THE SITE (NEARMAP 2024)

2 BACKGROUND

The following section of the report describes the site, the surrounding landscape context and the history of use.

The Citiswich Estate, previously known as Bremer Business Park, is a 350 ha master planned precinct encompassing industrial / business, residential, commercial, and retail development. Situated in the Southwest Industrial corridor identified in the South East Queensland Regional Plan, the site is 8 km northeast of the Ipswich CBD & 40 km west of the Brisbane CBD.

The Citiswich Estate, divided into seven (7) stages, is bisected west to east by the Warrego Highway and bordered by the Brisbane to Ipswich rail line. The locality is within the suburbs of Bundamba and Riverview, characterised by mixed-use areas, primarily industrial and farming activities, along with pockets of residential zones. Refer to Figure 2 for a map of the Citiswich Estate context.

This report focuses on Stage 7, the final stage of the Citiswich master plan. Stage 7 of the Citiswich development includes land north of the Warrego Highway and south of the Bremer River. Stage 7, similar to the rest of the Citiswich development, has been designed to meet the increasing demand for low-impact business and industry commercial development in Ipswich. Successful stages precede Stage 7. Land use will be low-impact industrial as per stages 1-6 of the Citiswich Estate development. Citiswich Stage 7 is approximately 112.0 ha in size and is comprised of the following lots:

- Lot 13 on SP 238272 (11.6 ha)
- Lot 34 on SP 326668 (43.8 ha), and
- Lot 2 on RP 104683 (56.6 ha).

The land is located within the City of Ipswich local government area and is subject to the Ipswich Planning Scheme, whereby it is zoned:

- Regional Business and Industry (Low Impact);
- Regional Business and Industry (Medium Impact); and,
- Regional Business and Industry Buffer.

As stipulated in the Ipswich Planning Scheme Part 6 – Regionally Significant Business Enterprise and Industry Areas (Ipswich City Council 2006), General Business and Industry (Low Impact) zones, which fall within the Regional Business and Industry sub-area, act as the primary job creators in the locality and serve as a buffer between urban and residential developments. The planned development will be low-rise, aesthetically landscaped, and will demonstrate high-quality urban design, particularly to street frontages. Building complexes will typically be characterised by a mix of tenancies and shared access and parking opportunities (Ipswich City Council 2006).

Low impact industry zones aim to minimise environmental impact compared to other industrial uses, focusing on maintaining local amenity and minimising residential

disturbance. The Ipswich Planning Scheme (Ipswich City Council 2006) stipulates that Low Impact Industry should provide a mix of business and industrial activities that do not generate unacceptable emissions / impacts or safety risks in areas close to residential or other sensitive land uses. Buildings must be designed and constructed to mitigate adverse impacts on the amenity of nearby lands, with particular attention given to noise impact mitigation for nearby residents (Ipswich City Council 2006). Refer to Figure 3 for a map of the site zoning under the City of Ipswich, where it is evident that the site and adjoining properties are zoned for industry.

The site currently contains patches of native regrowth vegetation amongst predominantly disturbed areas. It has been historically cleared of remnant vegetation and developed for other purposes, including:

- Infrastructure including sewer, water, gas and electricity grid transmission lines (HVP);
- Mining and quarrying, including areas of mining heritage and residual undermined areas, are displayed in (Figure 4). It is understood that the Department of Transport and Main Roads (DTMR) has since filled some of the undermining voids; and,
- Grazing and agistment, which is the current site use.

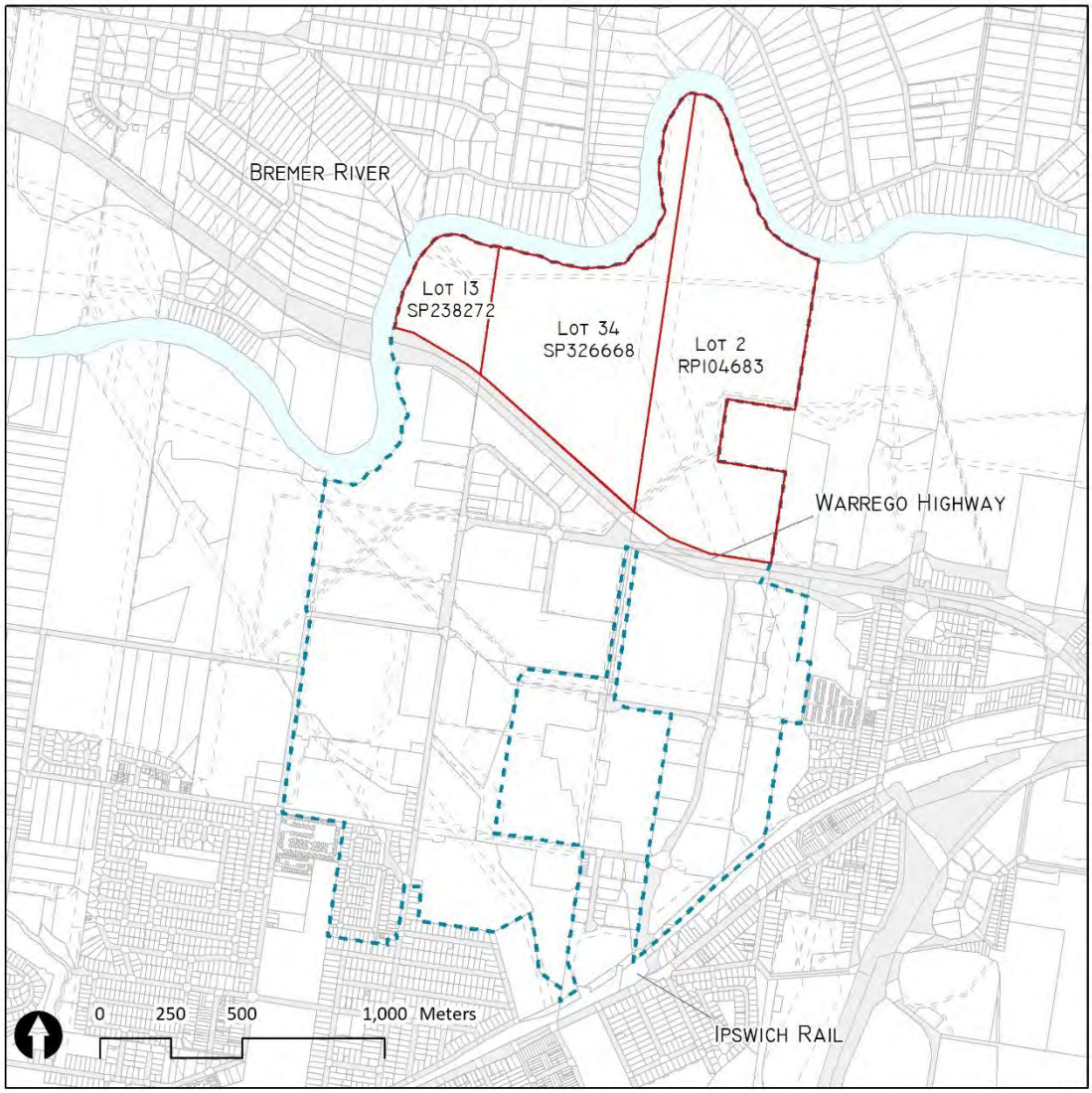


FIGURE 2: CITISWICH ESTATE SITE CONTEXT.

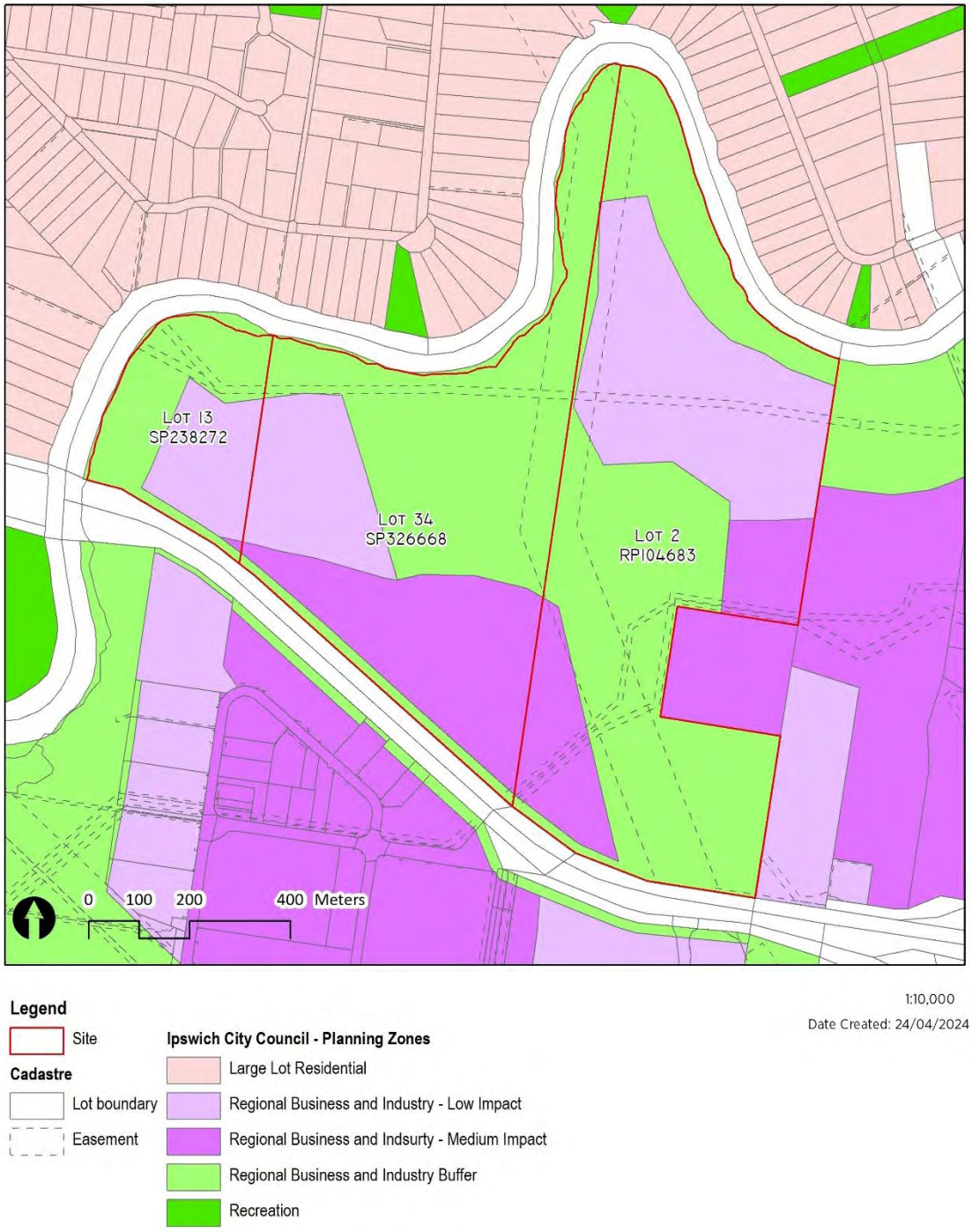


FIGURE 3: CITY OF IPSWICH LOCAL GOVERNMENT SUB-AREAS WITHIN THE REGIONAL BUSINESS AND INDUSTRY ZONE (IPSWICH CITY COUNCIL 2006).

FIGURE 4: LOCATION OF UNDERMINING, SURFACE CUT MINES AND MINING INFLUENCE CONSTRAINED AREAS (IPSWICH CITY COUNCIL 2006).

3 DESCRIPTION OF THE ACTION

The Stage 7 site of the Citiswich Estate development is approximately 112.0 ha in size. The proposed action includes a subdivision of three (3) lots into twenty (20) industrial use lots and operational works to develop and service the industrial lots.

The development is proposed to be initiated in 2025 and completed in 2027. For more detailed information about the timing of works, refer to Section 7: Impact Identification.

The following sections include further information on:

- Proposed action;
- Design and operational considerations, including:
  - Nominal impacts;
  - Future highway expansion;
  - Flooding;
  - Access;
  - Open space infrastructure;
  - Fencing;
  - Bushfire; and
- Material changes since the referral.

3.1 PROPOSED ACTION

A number of design and operational considerations such as flooding, nominal impacts and site access have been considered in the proposed development footprint. As such, the development footprint may be less than the impacts assessed in this PD Report; however, a conservative approach has been taken to account for potential changes to impact areas.

The total proposed action (70.0 ha) is comprised of the[1]:

- Development footprint (68.8 ha); and
- The haul road (1.2 ha).

Excluding the haul road, spatial analysis indicates that the total Stage 7 site consists of the following areas:

- 68.8 ha for mixed-use development; and

[1] A future road reserve is proposed north of Lot 12 and the existing gas easement. Maps and plans in the Appendices may display this road reserve for context. The trigger for the development of the road is the development of industry in the adjoining lot to the east. The road will not be cleared or developed by Walker Corporation and will remain vegetated. As these works form part of the actions of others and are until such time not required, this area has been excluded from the proposed action.

- 43.2 ha of balance land to be dedicated to Council as parkland as per condition 23 of the Preliminary Approval for Material Change of Use component of permit 3356/2002/CA (Appendix 5 – Relevant Approval).

Refer to Figure 5 for the proposed development for assessment against the EPBC Act.

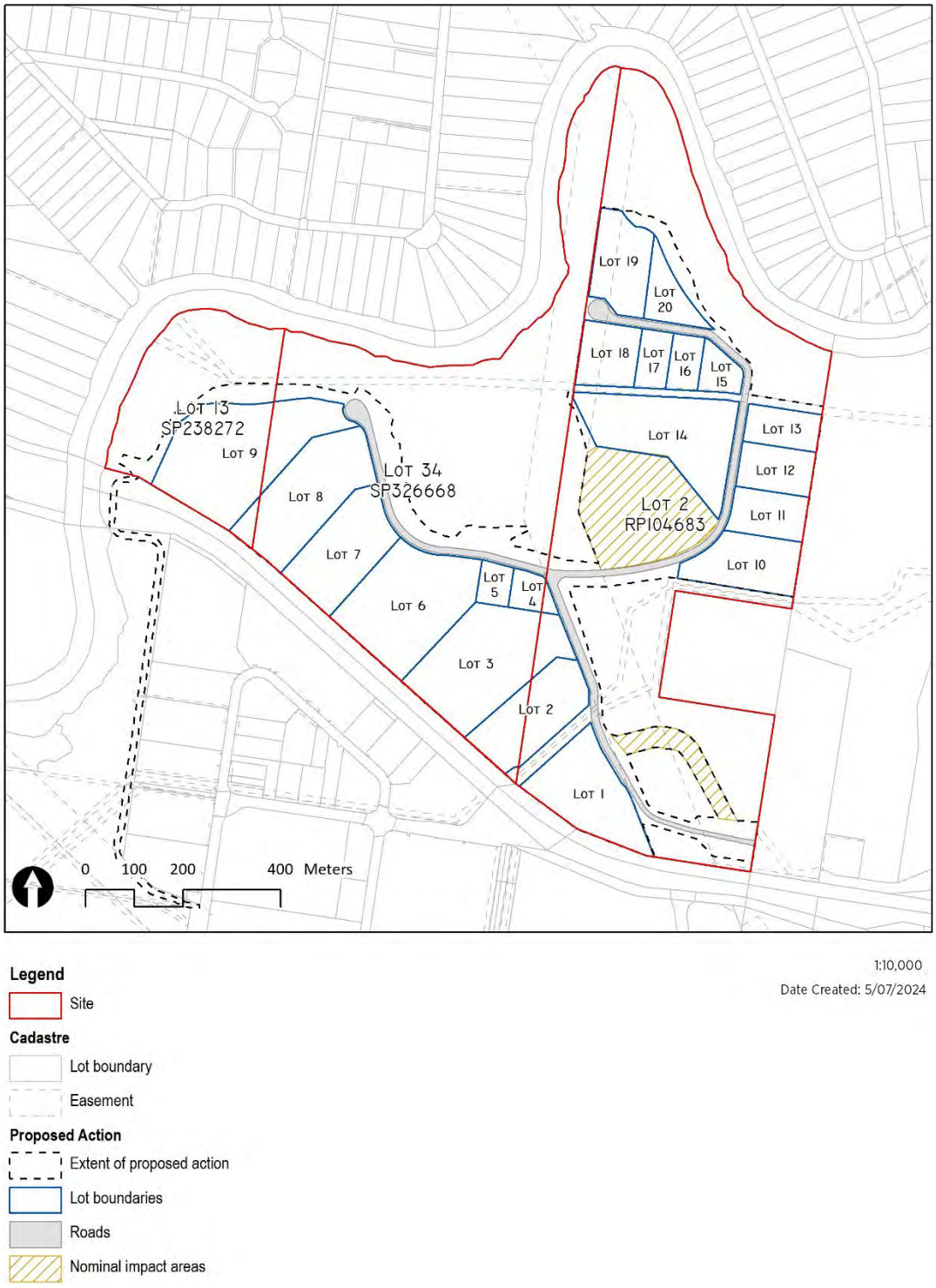


FIGURE 5: DEVELOPMENT FOOTPRINT/PROPOSED ACTION FROM WALKER CORP AND ARCADIS ENGINEERING PLAN ISSUE 02 (02.08.23).

3.2 DESIGN & OPERATIONAL CONSIDERATIONS

Several design and operational considerations have influenced the layout, including nominal impact areas, site access, a future highway expansion, and flood risk. Within the constraints of design and operational considerations, impacts to MNES as a result of the development footprint were considered and have been avoided, minimised and mitigated to the maximum practicable extent.

3.2.1 NOMINAL IMPACTS

The impact area being assessed for this PD Report includes the extent of stage boundaries and earthworks submitted for approval to the City of Ipswich, as well as two additional impact areas for waterway realignment (Waterways for Waterway Barrier works assessed by the State of Queensland) and a potential alternative internal Westphalen road access option on Lot 2 RP104683. Refer to Appendix 3 for development plans by Arcadis Australia Pacific Pty Ltd dated August 2023 that were submitted to the City of Ipswich as part of a development application, detailing the extent of proposed lots, stage boundaries, and earthworks. The City of Ipswich is assessing the plans at the time of PD submission. There are notable differences between the plans submitted to the Council and the development footprint assessed in this PD report, namely that the impact area submitted for assessment under the EPBC Act is larger in two locations. The development footprint has been nominally increased as:

- The access road may have to be realigned due to ongoing discussions with TMR and design considerations associated with the historical underground mining. Hence, the potential (second) road alignment has been included in the assessment of impacts.
- The proposed development in Lot 2 RP104683 includes a waterway realignment. As this application has not yet been approved, this assessment has assumed that all vegetation in the vicinity of the realignment will be impacted. Once the design is finalised and the approval is obtained from the State, it is possible that some vegetation in this area may be retained.

3.2.2 FUTURE HIGHWAY EXPANSION

The Queensland DTMR has recently approved planning (long-term) for upgrades to the Warrego Highway between Dinmore and Helidon. The site includes a corridor of land on the northern side of the Warrego Highway designed to enable future highway expansion. [redacted]. Figure 5 indicates the location of the proposed highway expansion.

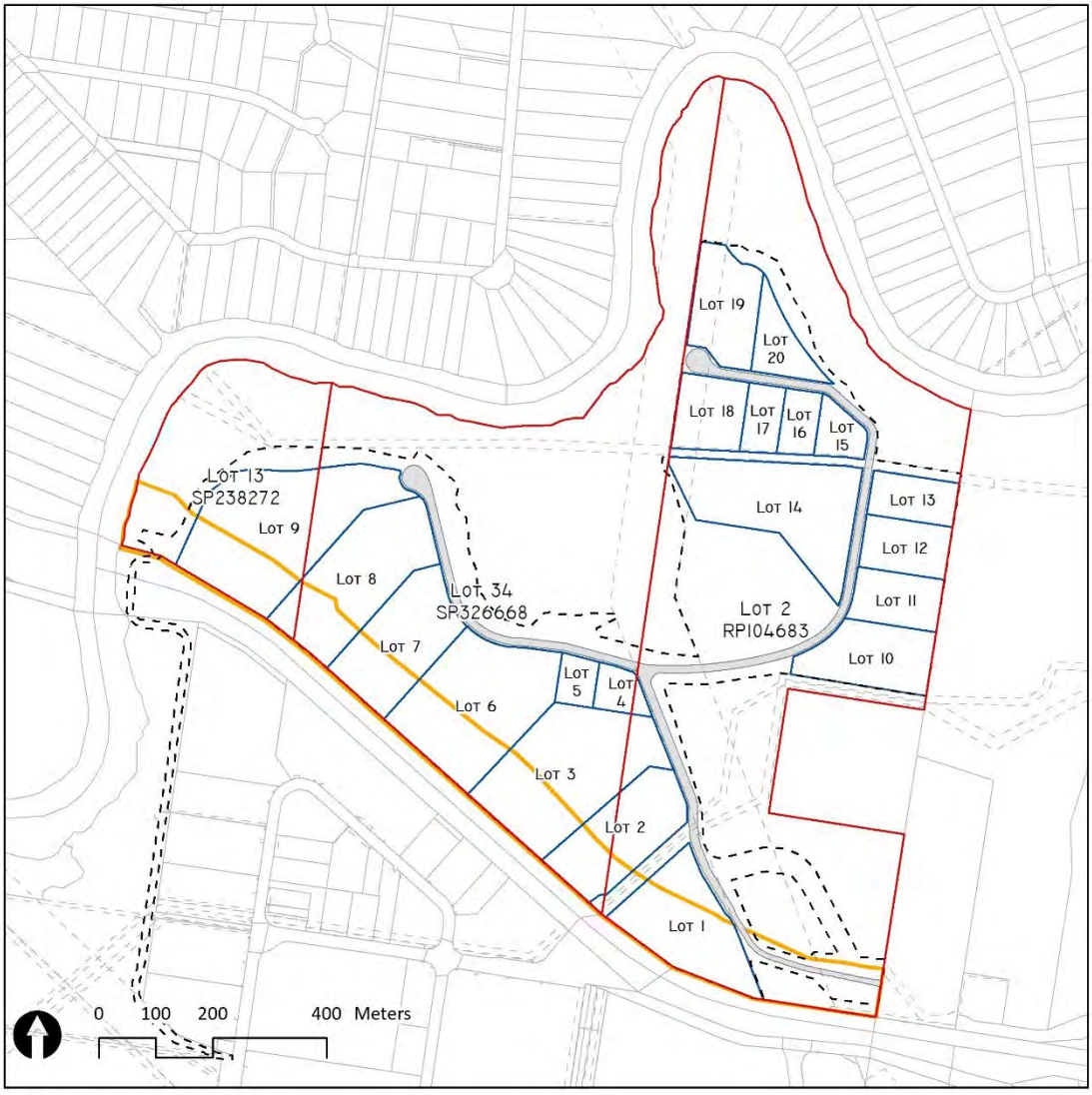


FIGURE 6: PRELIMINARY PROPOSED WARREGO HIGHWAY EXPANSION PLAN, DEPARTMENT OF TRANSPORT AND MAIN ROADS (PROVIDED BY WALKER CORP. 2024).

3.2.3 FLOODING

In addition to the highway expansion, the high flood risk in the area has informed the development design. Flooding constraints are present across most of the site. Due to safety reasons, the development footprint has been heavily constrained by flood risk. Rehabilitation of the open spaces has also been constrained, as introducing vegetation

into these areas poses a risk of exacerbating downstream flooding issues. As such, impacts on native vegetation, although minimised as much as practicable, could not be avoided in some locations due to the intersection of high elevation and vegetation.

Refer to the flood report prepared by Alan and Dennis (Appendix 4), which has been submitted as part of a Reconfiguring a Lot (RAL) and Operational Works (OPW) application to the Council, for more information on flooding. Per the report, the 1% annual exceedance probability (AEP) sits at 18.73 metres above mean sea level or Australian Height Datum (AHD), and the 5% AEP event sits at approximately 11.5m AHD.

3.2.4 ACCESS

This section addresses site access to the Stage 7 site for:

- Construction; and
- Operation

3.2.4.1 CONSTRUCTION ACCESS

A new haul road will be established outside the property to deliver materials to the impact area and avoid site access that utilises the Warrego highway due to safety considerations. The haul road is an existing dirt track that will be reinforced to prevent erosion and dust or other soil disturbance resulting from frequent usage during construction. No vegetation clearing will be required for the haul road as the existing track is already disturbed and cleared of vegetation.

Refer to Figure 6 for an outline of the approximate locations of site entry points and the haul road footprint. Refer to Section 7 for impact management measures.

3.2.4.2 OPERATIONAL ACCESS

The Stage 7 site has been designed in consultation with local authorities to integrate operational access with existing road reserves approved as part of other development applications. The land directly to the southeast described as Lot 1 on RP103506 was approved for a Reconfiguration of a Lot application submitted by Westphalen Developments Pty Ltd under approval number 2438/2022/RAL. The approved development includes approval for the development of an expansion of Westphalen Drive including access through Lot 1 on RP103506 to Lot 2 RP104683 (the Stage 7 site) in anticipation of future industrial development. The Citiswich Stage 7 proposed development will utilise the extension of Westphalen Road approved in 2438/2022/RAL to provide operational site access to the Stage 7 site.

Maps and plans included in the Appendices of this report display Lot 1 on RP103506 for context. The development works associated with the road and reserve will not be completed by Walker Corporation and therefore have not been considered in the proposed action.

The development approval over Lot 1 on RP103506 is contained in Appendix 5.

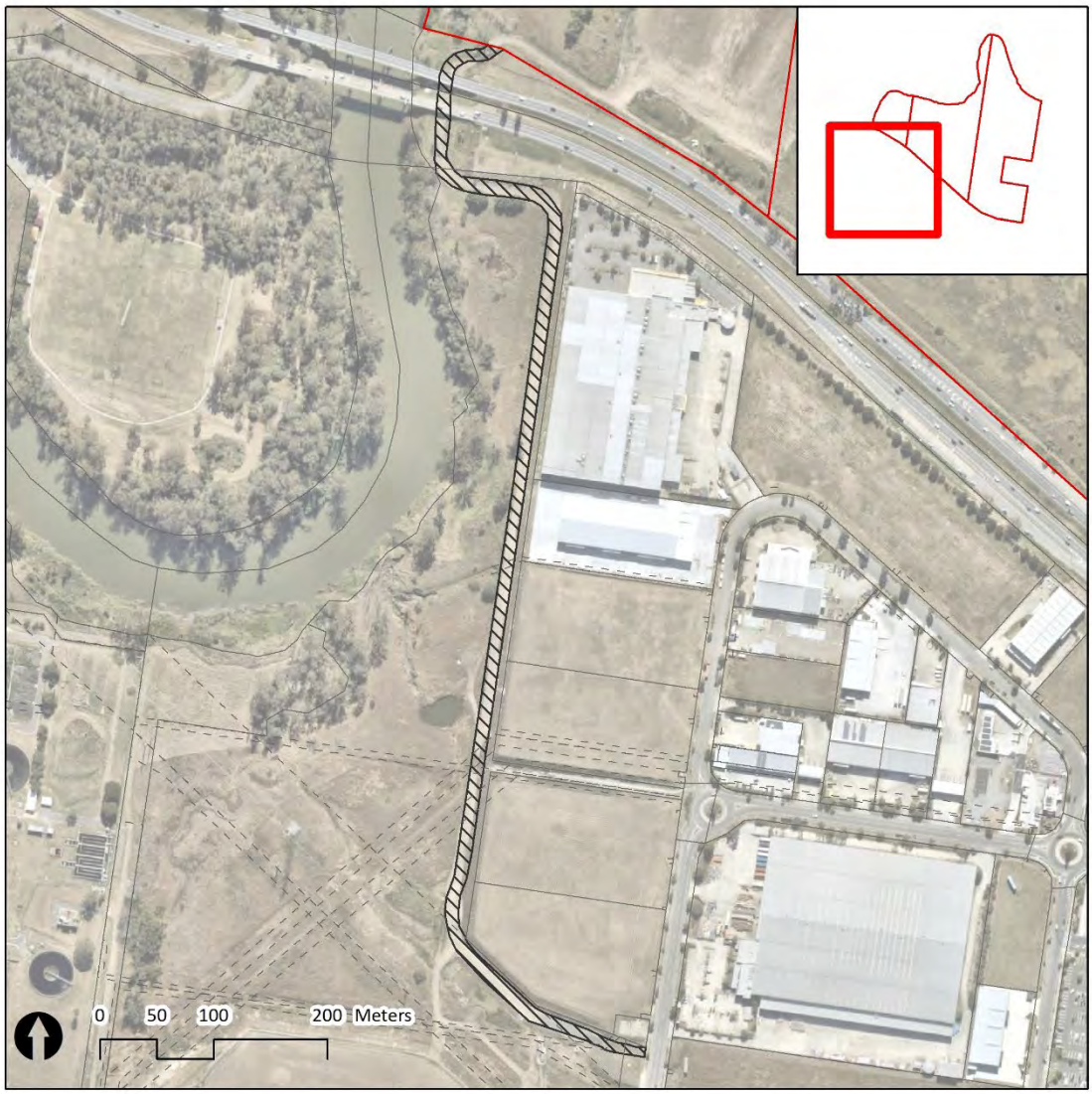


FIGURE 7: SITE ACCESS AND HAUL ROADS TO THE DEVELOPMENT FOOTPRINT (HAUL ROAD DRAWING).

3.2.5 OPEN SPACE AREAS

Open space areas will act as multi-use parklands with minor walking trails and opportunities for observation of cultural heritage sites related to old mining and quarrying practices. All native vegetation in open space areas will be retained. Previous

development approval permit conditions require the open space areas to be dedicated to the council as parkland, as per condition 23 of the Preliminary Approval for Material Change of Use component of permit 3356/2002/CA (Appendix 5 – Relevant Approval).

Heritage trails and perimeter walkways (2.2 – 2.5m width) will be installed in the open space areas outside the lot boundaries in disturbed (cleared) areas not containing native vegetation. Trails will provide access to sites of local historic significance, including old quarry areas. Paths will be accompanied by low-impact interpretive signage and safety restrictions. The proposed trails are located:

- Largely within powerline easements, and
- Outside of all native vegetation areas.

Plans displaying the walking paths are currently indicative and concept only. No clearing of native woody vegetation will be required to install the heritage trails and walking paths and this can be conditioned by approval.

Access to heritage sites is to be provided in accordance with the Cultural Heritage Management Plan (December 2008) Appendix 6. The locations of access trails are to be provided in accordance with the Andrew Gold Landscape Architecture Plan contained in Appendix 7.

3.2.6 FENCING

The design of the proposed development will ensure that all fencing is fauna-friendly. Detailed design has not been proposed and as such the exact locations and materials for fencing are not confirmed. Conditions can be imposed that require fencing to be made from fauna-friendly materials such as small gauge mesh and prohibit the use of barbed wire, netting or spikes. The approval should require standards and conditions of purchase to be maintained by owners of industrial lots. The proponent will ensure that information will accompany each purchase to inform the buyer of their environmental and design responsibilities, including guidelines that outline the restrictions on materials to create fauna-friendly environments.

3.2.7 BUSHFIRE

A bushfire hazard assessment has been completed for the site in accordance with relevant State Government guidance material. The hazard assessment considers the retention of native vegetation, the proposed management of exotic vegetation and all clearing necessary for the construction of the proposed development.

Modelling results indicated that the subject land contains areas of medium potential fireline intensity which occur in several small patches outside of the development footprint. The result of the bushfire assessment indicates that the proposed development is subject to acceptable levels of bushfire risk such that no additional management measures including vegetation maintenance or clearing are required to control bushfire risk.

Refer to Appendix 8, the Bushfire Hazard Assessment and Management Plan, for detailed information about bushfire risk.

3.3 MATERIAL CHANGES SINCE THE REFERRAL

The proposed development incorporates several design changes since the initial referral to the Department in 2021. The impact area at the time of referral was 59.8 ha, which included 15.9 ha of vegetation clearing. After a series of design iterations since referral, the current impact area (including the haul road) is 70.0 ha, which includes 17.4 ha of vegetation clearing. Thus, comparing the current scenario with the referral stage documentation:

- The development footprint has increased by approximately 10.6 ha,
- The extent of vegetation clearing has increased by approximately 1.5 ha.

Material changes to the development footprint have occurred since referral as a result of the following:

- The access road for post-construction public access to Stage 7 has changed. This road has been part of ongoing discussions with DTMR due to integration with the upcoming Warrego Highway expansion. Safety considerations regarding the underground mining history in the area have also been considered in the decision to adjust the alignment. Although the preferred road access option is the design displayed in the Arcadis earthworks plan (Appendix 3), the potential (second) road alignment may be required pending discussions with TMR and the Council. As such, the proponent has provided the secondary alignment for assessment as it is the larger of the two impact areas.
- Other changes across the development footprint have resulted from minor design adjustments and optimisation of the layout for earthworks design and flood safety reasons.

Refer to Figure 8 below for the material changes between the referral stage (2021) and the current (2023) development footprints.

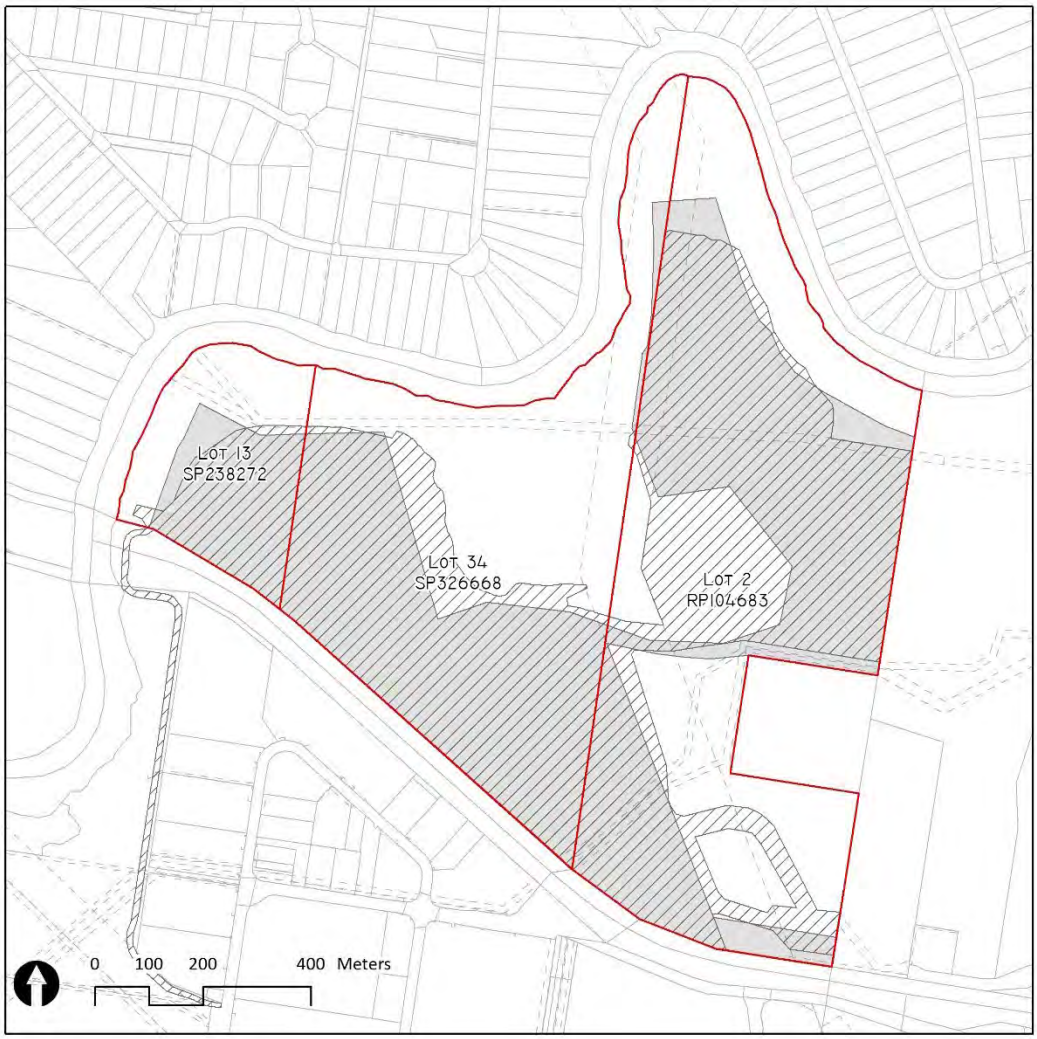


FIGURE 8: MATERIAL CHANGES BETWEEN THE REFERRAL STAGE (2021) AND CURRENT DEVELOPMENT FOOTPRINTS (EARTHWORKS MODIFIED FROM ARCADIS ENGINEERING PLAN ISSUE 02, 02.08.23).

4 PREVIOUS ASSESSMENT & APPROVALS

Stage 7 has been the subject of ongoing environmental assessment for several years, over which time a comprehensive site record has been established, including a thorough understanding of species presence, distribution, abundance and habitats.

The following section provides further detail on:

- Desktop and field assessment,
- Existing approvals, and
- Further approvals.

4.1 SITE ASSESSMENTS

To ensure that this PD is supported by best-available baseline data, extensive on-ground survey information from all environmental assessment history on the site was drawn on to inform assessments. Ecological surveys have been carried out on Stage 7 since 2016. Various field investigations were carried out by Litoria every year from 2019 to 2023 based on a combination of:

1. Spatial analysis (GIS data);
2. Field investigations; and,
3. Review of relevant wildlife databases, including fauna habitat suitability assessment.
4. A supplementary specialised (dog-detection) survey was conducted by OWAD Environment in 2021.

Additional surveys have been conducted since the referral to assess the quality of habitat for the GHFF, including the BioCondition survey of habitat, and supplementary species-specific methods for assessing GHFF habitat. Field methods adhered with best practice commonwealth and state guidance material where available.

Overall, the field investigations included the following field survey methods and dedication of hours:

- Allowance for inter-seasonal variability (summer, autumn and winter);
- Over 12 km of targeted survey by detection dogs;
- Over 70 hours of targeted botanical survey and vegetation assessment;
- Over 45 hours of targeted fauna survey including spotlighting and transect surveys;
- Over 90 hours of unattended acoustic recordings; and,
- Over 150 hours of incidental fauna observations and habitat assessment throughout the survey period.

Where possible, data was collected in accordance with Commonwealth-approved survey guidelines, and State guidance where commonwealth material was absent.

Commonwealth guidance material that was applied to field investigations for Australia's threatened mammals, reptiles, frogs, birds and bats (Commonwealth of Australia 2010; Department of the Environment 2010a; Department of the Environment 2010b; Department of Sustainability 2011; Department of Sustainability Environment Water Population and Communities 2011). Surveys were conducted in accordance with the following guidelines and recommendations to maximise detection:

- Only suitably qualified experts with tertiary qualifications conducted the surveys.
- Scoping exercises to identify MNES most likely to occur on or nearby to the site were completed to aid survey planning.
- Maximum recommended survey time was utilised to reduce Type II error.
- Undertaking surveys, including targeted surveys, over long periods of time and/or repeating surveys.
- Supporting techniques such as Unattended Acoustic Recording (UAR) and detection dog surveys were utilised to complement surveys by ecologists. The use of Koala detection dogs has been supported by peer-reviewed literature and is known to enhance the effectiveness of ground-based surveys in locating live koalas compared to human observers (Cristescu *et al.* 2012; Woosnam–Merchez *et al.* 2012; Cristescu *et al.* 2015; Cristescu *et al.* 2020).

Species-specific guidance was also incorporated for a survey of the GHFF. Survey for the GHFF was completed in accordance with the GHFF specifications in the sub-section of the survey guidelines for Australia's threatened bats. (Commonwealth of Australia 2010), including:

- Database searches were conducted for the location of camps and vegetation surveys to identify feeding habitats;
- Extensive diurnal field surveys were completed for the identification of camps, which are usually conspicuous, and readily found by walking transects; and
- Nocturnal surveys (12 nights) and UAR (approximately 90 hours of recordings) supplemented the assessment.

4.2 EXISTING APPROVALS

A variety of existing approvals pertain to the Stage 7 development. Key development approvals include the following:

- On June 30, 2004, the preliminary approval (3356/2002/MAMC/B) for the Citiswich Estate was attained under the City of Ipswich to subdivide and develop the site for a mixture of commercial/industrial, residential, and open space purposes across 7 stages. The City of Ipswich granted preliminary approval to change the material use of premises and reconfigure a lot for the development of the Citiswich Estate (formerly Bremer Business Park). The approval was evaluated and granted under the Integrated Planning Act 1997 (IPA) (Qld).
- The preliminary approval incorporates the 'Bremer Business Park Preliminary Approval (BBP) document, with the currently approved document dating back to

July 11, 2018. The BBP modifies the Ipswich Planning Scheme's impact on subsequent development on the land, providing an overall vision and specific outcomes for the entire site and individual sub-areas. The BBP acknowledges seven sub-areas, each corresponding to a zone within the Ipswich Planning Scheme (2006). The BPP is backed by an Overall Landscape Masterplan, approved by the City of Ipswich as part of the preliminary approval changes made in 2018.

Appendix 5 contains a summary of the existing development approvals for the Stage 7 site.

4.3 FURTHER APPROVALS

A variety of anticipated local and state approvals pertain to the Stage 7 development:

- A Reconfiguring a Lot (ROL) - three (3) lots into twenty (20) lots plus park and road reserve; and Operational Works (OPW) - earthworks and waterway barrier works for Stage 7 has been submitted with the City of Ipswich on the 03/08/2023 and is currently being assessed by Council under application number 7995/2023/CA.
- Additionally, state approval will be required for *protected pl*ants under the *Nature Conservation Act 1992* (Qld) and the *Nature Conservation (Plants) Regulation 2020* (Qld). This is currently being prepared by Litoria Consulting for submission to the State. The site survey based on the *Flora Survey Guidelines - Protected Plants* (Department of Environment and Heritage Protection 2014)) is complete, and reporting is underway for the submission.
- Waterways for Waterway Barrier Works approval (Qld) is forthcoming under the *Fisheries Act 1994* (Qld).

5 EXISTING ENVIRONMENT

This section of the report describes the existing environmental values of the site that have been established based on the extensive field surveys described in Section 4.1: Site Assessments. Results are described for physical characteristics of the site including topography, geology and the presence of waterways and/or wetlands, together with biological features including vegetation and fauna.

The following sections contain more information in regard to:

- Topography;
- Geology;
- Waterways and wetlands;
- Flora;
- Fauna; and
- Surrounding landscape.

5.1 TOPOGRAPHY

The landform pattern can be described as *undulating rises* (UR) according to the National Committee on Soil and Terrain (2009). Much of the land lies between 10m and 30m AHD. The modal slope across the majority of the site is <4%; however, is up to approximately 10% in some areas adjacent to the river.

Refer to Figure 9 for a map of site topography.

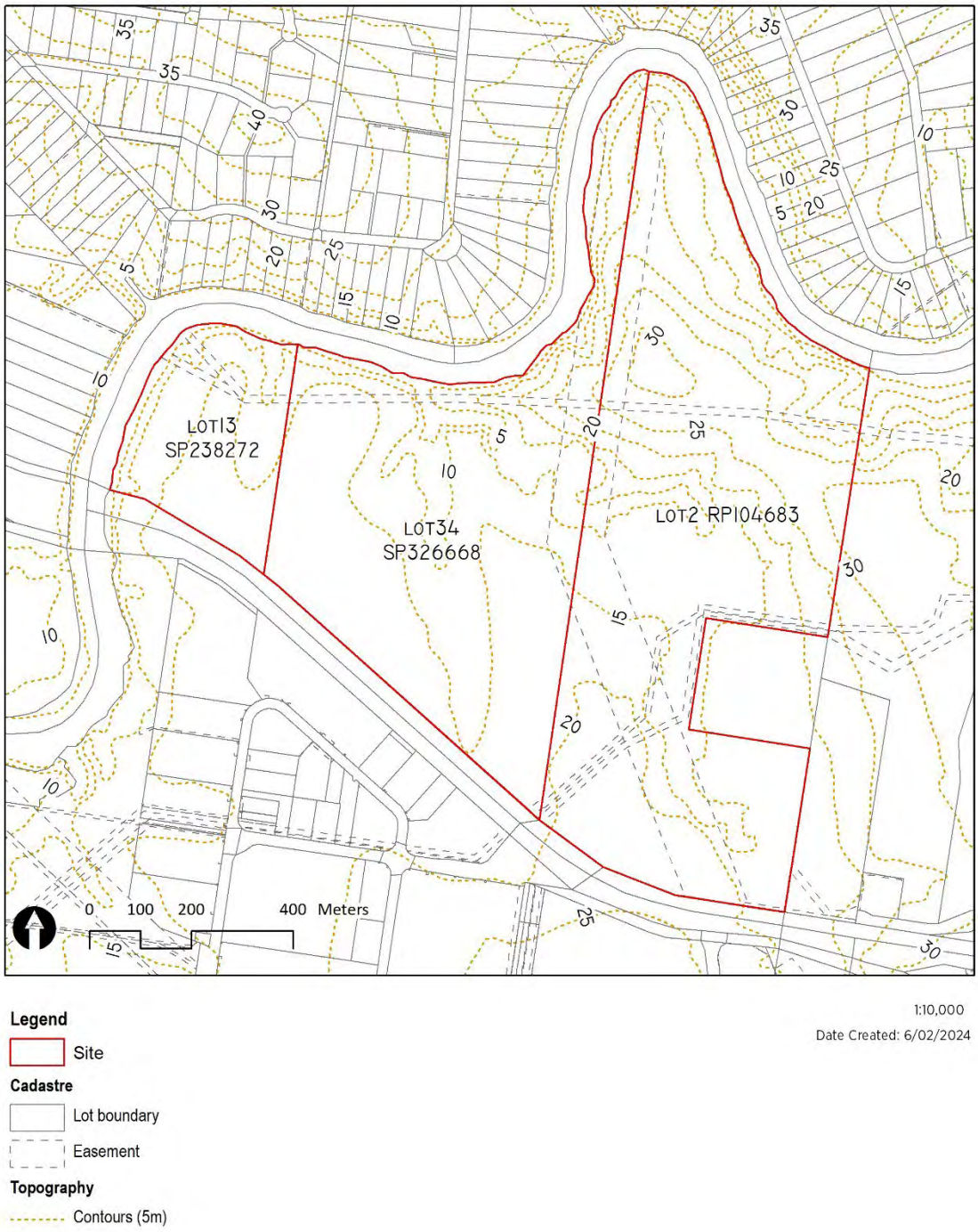


FIGURE 9: CONTOURS OF THE SITE (5M SEPARATION) (DEPARTMENT OF NATURAL RESOURCES AND MINES 2016).

5.2 GEOLOGY

Geological data was obtained from the Geological Survey of Queensland (2011). The geology of the site can be described as a mixture of Redbank Plains Formation, Tivoli Formation, second river terraces and stranded river terraces.

Site geology is described further in Table 1. Refer to Figure 10 for a map of surface geology.

TABLE 1: GEOLOGY OF THE SITE.

Name	Description
Qha/1-9543	Lowest river terrace; gravel, sand, silt, clay.
Qha/2-9543	Second river terrace; sand, silt, clay, gravel.
Qpa//1-9543	Stranded river terrace (above flood plain); clay, silt, sand, gravel.
Redbank Plains Formation	Lacustrine interbedded multi-coloured claystone, shale, and labile sandstone.
Tivoli Formation	Sandstone, shale, siltstone, coal

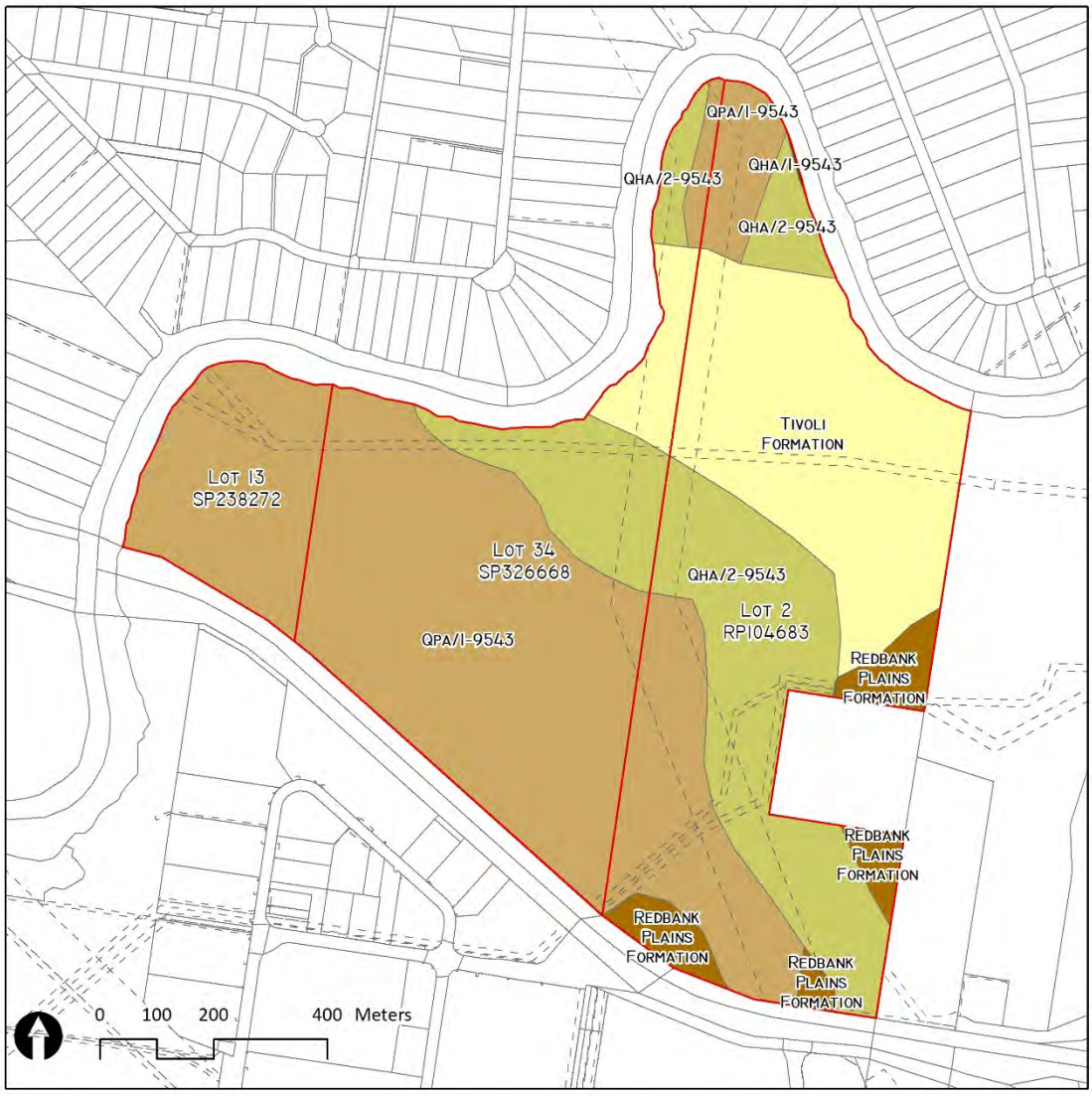


FIGURE 10: GEOLOGY OF THE SITE (GEOLOGICAL SURVEY OF QUEENSLAND 2011).

5.3 WATERWAYS & WETLANDS

The site is located on the Bremer River and is approximately 72 km upstream from Moreton Bay RAMSAR wetlands. The site, at its nearest point, is approximately 38 km (straight line) from Moreton Bay, with water draining off the site into the Bremer River which flows into the Brisbane River, then into Moreton Bay.

A waterway runs from the southeast corner of the site in a northwest direction before joining the Bremer River. The waterway was observed to be in a degraded condition. Vegetation along parts of the waterway has been cleared of riparian vegetation (particularly within the easements dissecting the site). Where vegetation is present it is comprised of a mix of native and exotic species, while the understorey is dominated by invasive and weed species.

5.4 FLORA

Ground truthing of the vegetation communities was conducted to capture the extent of actual observed vegetation (habitat) on-site. Results of the botanical survey are described according to vegetation communities (Vegetation Survey Units = VSUs) observed within the survey extent. VSUs were established and classified on the basis of tertiary and quaternary methods described in Neldner, Wilson *et al.* (2019) and included such criteria as:

- Strata (canopy, mid-storey, shrub or understorey),
- Relative species abundance in observed strata (dominant, co-dominant, common or associated),
- Landform,
- Aspect,
- Geology, and,
- Hydrology (where applicable).

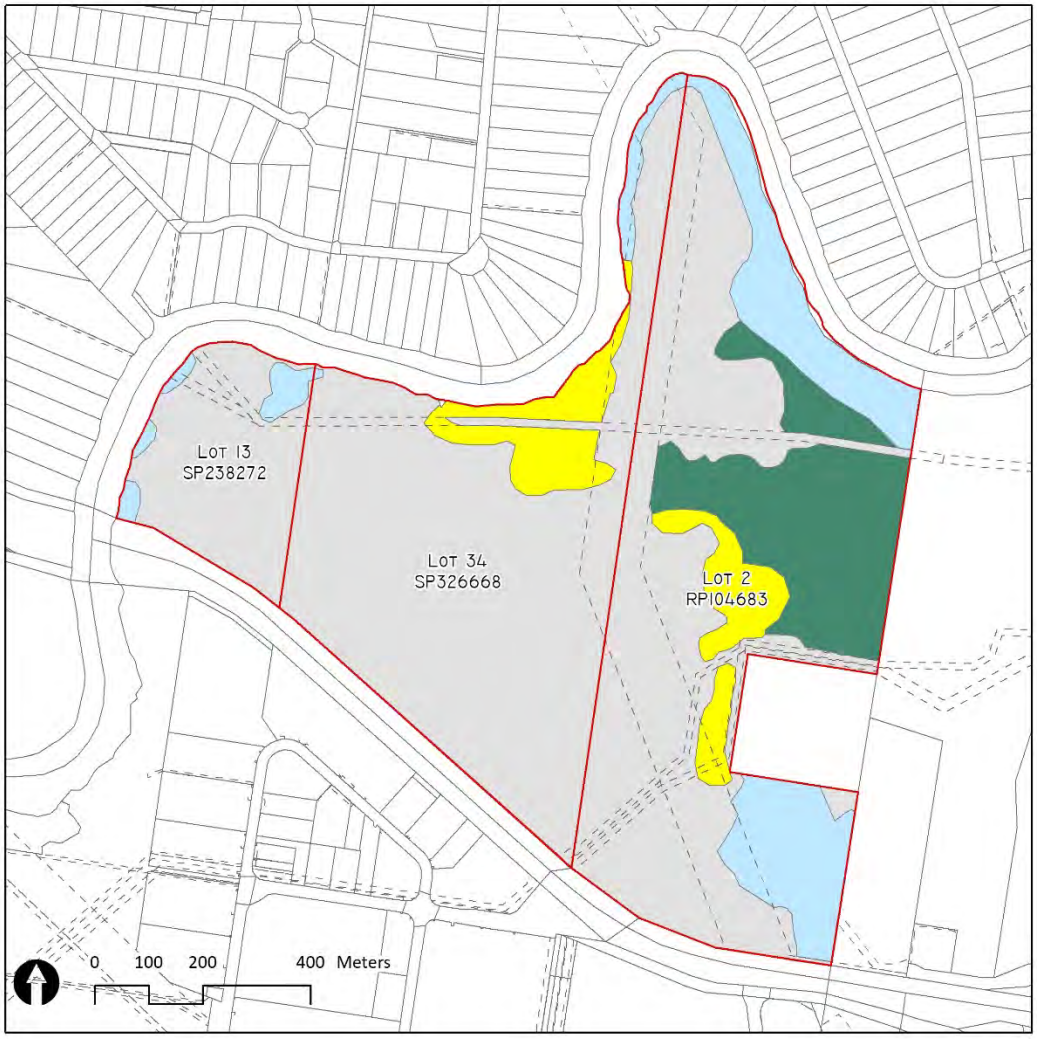
The observed vegetation consisted of four types of vegetation communities, including:

- VSU 1: Cleared and disturbed areas containing predominantly exotic grasses,
- VSU 2: Regrowth RE 12.9-10.2,
- VSU 3: Regrowth RE 12.3.7, and
- VSU 4: Regrowth RE 12.3.3.

Example images of each of the vegetation survey units are shown in Figure 12, Figure 13, Figure 14 and Figure 15.

TABLE 2: DESCRIPTION OF VEGETATION SURVEY UNITS.

VSU	Description	Details	Area (ha)
1	Disturbed/open space areas.	Open grassland, dominated by exotic species, generally devoid of native trees or with few scattered, native trees.	77.1
2	Regrowth RE 12.9-10.2 (least concern). *Corymbia citriodora subsp. variegata +/- Eucalyptus crebra open forest on sedimentary rocks.*	Woodland to open forest on sandstone. Canopy (~15-25m) species included *Corymbia citriodora*, *C. intermedia, E. crebra, E. siderophloia* and *Angophora leiocarpa*. Shrub layer (~2-6m) and understorey (~0-2m). Vegetation was varied, with some patches containing a sparse native shrub layer and native understorey species and other areas dominated by invasive and weed species.	13.2
3	Regrowth RE 12.3.3 (endangered). *Eucalyptus tereticornis* woodland on Quaternary alluvium.	Eucalypt forest dominated by *Eucalyptus tereticornis, E. siderophloia* and *Corymbia intermedia* to ~25m. Sub-canopy (~10-15m), shrub (~2-6m) and understorey (~0-2m). Vegetation contained a mixture of native and exotic species. As with VSU 2, some areas were dominated by invasive and weed species in the shrub and understorey layers.	13.4
4	Regrowth RE 12.3.7 (of concern). *Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca spp. fringing woodland.*	Patches of vegetation with a canopy (¬12-22m) dominated by *Casuarina cunninghamiana* and exotic *Celtis sinensus* with scattered *Eucalyptus tereticornis* and *Lophostemon suaveolens* associated with river and creek banks. Shrub (¬1-10m) vegetation comprised a mix of native and exotic species, while understorey (¬0-1m) was dominated by invasive and weed species.	8.1



Legend

Site

Cadastre

Lot boundary

Easement

Vegetation Survey Units

VSU 1 - Disturbed / Open space

VSU 2 - Regrowth RE 12.9-10.2

VSU 3 - Regrowth RE 12.3.3

VSU 4 - Regrowth RE 12.3.7

1:10,000

Date Created: 25/04/2024

FIGURE 11: OBSERVED VEGETATION SURVEY UNITS.

FIGURE 12: TYPICAL VSU 1 VEGETATION.

FIGURE 13: TYPICAL VSU 2 VEGETATION.

FIGURE 14: TYPICAL VSU 3 VEGETATION.

FIGURE 15: TYPICAL VSU 4 VEGETATION.

5.5 FAUNA

A number of key fauna habitat features were also identified on the site. Identified key habitat features included:

- Arboreal termitaria;
- Hollow-bearing trees;
- Stags;
- Diggings;
- Various scats, including a range of Macropod scats;
- Stick nests; and,
- Coarse woody debris and other ground habitat suitable for ground-dwelling fauna.

Due to the regrowth nature of vegetation on the site and the lack of old-growth trees, incidental observations of habitat features including hollows and termitaria were low. Due to the high density of obstructive exotic ground vegetation, including the spiny *Harissa sp.* and *Lantana camara,* the ability of ground-dwelling fauna to move through the site was notably restricted.

Of the 56 species of birds observed during the field surveys, eight (8) of the observed species have an EPBC Act listing status of *Marine,* which is known as *Other Matters of Environmental Significance* under the *EPBC Act*. These species only require assessment if a project is within a Commonwealth Marine Area, and therefore are not assessable for the purposes of the site, as the site is not within a Commonwealth Marine Area. The Rufous Fantail was not observed as part of targeted surveys, incidental observations or acoustic recordings.

During the targeted fauna surveys, a single Grey-headed Flying-fox, listed as *vulnerable*, was seen flying over the site; however, there were no observations of Grey-headed Flying-fox feeding or roosting on the site.

The results of the Koala survey indicated no evidence of Koala present on the site. Given the comprehensive search and site conditions at the time of the survey, it was considered highly unlikely that this species was residing on the site. Further, it was also considered unlikely that the Koala would currently be able to access or utilise the site due to poor habitat connectivity and restrictive groundcover conditions on-site.

TABLE 3: FAUNA SURVEY RESULTS.

Scientific Name	Common Name	Survey Methodology	EPBC Status
Amphibians			
Rhinella marina	Cane Toad	NS, IN	-
Litoria caerulea	Green Tree Frog	NS	-
Litoria fallax	Eastern Sedgefrog	NS, UAR	-
Litoria peronii	Peron's Tree Frog	NS	-

Scientific Name	Common Name	Survey Methodology	EPBC Status
Litoria rubella	Naked Tree Frog	UAR	-
Limnodynastes peronii	Striped Marsh Frog	NS, IN, UAR	-
Birds			
Alectura lathami	Australian Brush-turkey	BS	-
Anas superciliosa	Pacific Black Duck	BS, IN, UAR	-
Cacatua galerita	Sulphur-crested Cockatoo	BS, UAR	-
Cacatua sanguinea	Little Corella	IN, UAR	-
Centropus phasianinus	Pheasant Coucal	IN, BS, UAR	-
Chenonetta jubata	Australian Wood Duck	BS, UAR	-
Cisticola exilis	Golden-headed Cisticola	IN, BS	-
Coracina novaehollandiae	Black-faced Cuckoo-shrike	IN, BS, UAR	Marine
Corvus orru	Torresian Crow	IN, BS, UAR	-
Coturnix ypsilophora	Brown Quail	IN, BS, NS, UAR	-
Cracticus nigrogularis	Pied Butcherbird	UAR	-
Cracticus torquatus	Grey Butcherbird	BS, UAR	-
Dacelo novaeguineae	Laughing Kookaburra	IN, BS, NS, UAR	-
Eolophus roseicapillus	Galah	BS, UAR	-
Eopsaltria australis	Eastern Yellow Robin	IN, BS, UAR	-
Eudynamys scolopacea	Pacific Koel	IN, BS, UAR	-
Eurystomus orientalis	Dollarbird	IN, BS, UAR	Marine
Gallus gallus	Rooster (off-site)	UAR	-
Geopelia humeralis	Bar-shouldered Dove	IN, BS, UAR	-
Geopelia striata	Peaceful Dove	IN, UAR	-
Glossopsitta pusilla	Little Lorikeet	IN, BS	-
Grallina cyanoleuca	Magpie-lark	BS	Marine
Gymnorhina tibicen	Australian Magpie	IN, BS, UAR	-
Hirundo nigricans	Tree Martin	IN, BS	-
Lichmera indistincta	Brown Honeyeater	IN, BS, UAR	-
Lonchura castaneothorax	Chestnut-breasted Mannikin	IN	-
Malurus cyaneus	Superb fairywren	IN, BS, UAR	-
Malurus melanocephalus	Red-backed Fairywren	IN, BS, UAR	-
Manorina melanocephala	Noisy Miner	IN, BS, NS, UAR	-
Megalurus timoriensis	Tawny Grassbird	IN, BS, NS, UAR	-
Meliphaga lewinii	Lewin's Honeyeater	UAR	-
Melithreptus albogularis	White-throated Honeyeater	BS, UAR	-
Merops ornatus	Rainbow Bee-eater	IN, BS, UAR	Marine

Scientific Name	Common Name	Survey Methodology	EPBC Status
Milvus migrans	Black Kite	IN, BS, UAR	-
Neochmia temporalis	Red-browed Finch	IN, BS	-
Ninox novaeseelandiae	Southern Boobook	NS, UAR	-
Ocyphaps lophotes	Crested Pigeon	UAR	-
Oriolus sagittatus	Olive-backed Oriole	UAR	-
Pardalotus striatus	Striated Pardalote	BS	-
Phalacrocorax sulcirostris	Little Black Cormorant	BS	-
Philemon argenticeps	Noisy Friarbird	BS, UAR	-
Philemon citreogularis	Little Friarbird	BS	-
Platycercus adscitus	Pale-headed Rosella	IN, UAR	-
Podargus strigoides	Tawny Frogmouth	NS	-
Porphyrio porphyrio	Purple Swamphen	UAR	Marine
Psophodes olivaceus	Eastern Whipbird	BS, UAR	-
Rhipidura leucophrys	Willy Wagtail	IN, BS	-
Scythrops novaehollandiae	Channel-billed Cuckoo	IN, UAR	Marine
Sericornis frontalis	White-browed Scrubwren	BS	-
Sphecotheres vieilloti	Figbird	BS, UAR	-
Strepera graculina	Pied Currawong	IN, UAR	-
Taeniopygia bichenovii	Double-barred finch	IN, BS	-
Todiramphus sanctus	Sacred Kingfisher	IN, BS, UAR	Marine
Trichoglossus moluccanus	Rainbow Lorikeet	IN, BS, UAR	-
Vanellus miles	Masked Lapwing	IN, UAR	-
Zosterops lateralis	Silvereye	IN, BS, UAR	Marine
Mammals			
Canis familiaris	Dog (off-site)	UAR	-
Equus sp.	Horses (off-site)	NS	-
Hydromys chrysogaster	Water Rat	IN	-
Isoodon sp.	Bandicoot	NS	-
Macropus giganteus	Eastern Grey Kangaroo	NS	-
Petaurus norfolcensis	Squirrel Glider	NS	-
Pseudocheirus peregrinus	Ringtail Possum	NS	-
Pteropus alecto	Black Flying-fox	IN, NS	-
Pteropus poliocephalus	Grey-headed Flying-fox	NS	V
Pteropus scapulatus	Little Red Flying-fox	IN, NS	-
Trichosurus vulpecula	Brushtail Possum	NS, UAR	-
Unidentified	Wallaby	IN	-

Scientific Name	Common Name	Survey Methodology	EPBC Status
Unidentified	Flying-fox	UAR	-
Unidentified	Microbat	IN, NS	-
Vulpes vulpes	Fox	NS	-
Reptiles			
Hemidactylus frenatus	Asian House Gecko	NS	-
Intellagama lesueurii	Eastern Water Dragon	IN	-
Tropidonophis mairii	Keelback Snake	NS	-
Insects			
Danaus plexippus	Monarch Butterfly	IN	-
Ephippitytha trigintiduoguttata	Spotted Katydid	IN	-

TABLE CODES:

- Survey methodology: KS = Koala survey, BS = bird survey, NS = nocturnal spotlight searches, IN = incidental, UAR = unattended acoustic recordings.
- EPBC Status: Indicates the Commonwealth conservation status of each taxon under the EPBC Act, coded as Extinct in the wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) or Conservation Dependent (CD), along with Marine or Migratory listings.

5.6 SURROUNDING LANDSCAPE

Citiswich Stage 7 is surrounded by predominantly industrial and residential land at the landscape scale. Industrial land uses characterise all boundaries of the Stage 7 development, thereby creating barriers/threats to fauna dispersal. The surrounding landscape can be described as follows:

- The southern boundary of Citiswich Stage 7 is bordered by the Warrego Highway (approximately 50-60m wide, soon to be expanded). Further south at the Citiswich Estate boundary, the Brisbane to Ipswich Rail Line bisects the land. Both major transport corridors pose significant barriers to terrestrial fauna movement.
- The Bremer River (approximately 50-70m in width) establishes the northern and western borders of the site.
- At a landscape scale, the majority of the sites in the surrounds are disturbed or developed. Refer to Figure 4, which displays the Regulated Vegetation (Categories B (remnant) and C (regrowth) vegetation) within 3 km of the site. Within 3 km of the site, only 13% of the land area is remnant or regrowth vegetation.
- Three adjoining lots comprise the eastern boundary. These lots contain native vegetation adjacent to the development footprint (Figure 4):
  - Lot 1 SP121057 supports industrial operations for *JBS Food Australia,* including hide processing, carriers, and wholesalers. Regrowth vegetation occupies the balance of land on this lot.

  - Lot 1 RP104683 and Lot 1 RP103506 also adjoin the site and contain small pockets of regrowth vegetation. They are predominantly utilised for mining and quarrying activities.
  - The sum of vegetation on the adjoining lots is 16.9 ha of regrowth (Category C area). The vegetation is isolated from other native vegetation by the Bremer River, Bruce Highway and industrial land use.
- The site is disconnected from corridors, patches or stepping stones of native vegetation and is generally isolated at a landscape scale and in the immediate context of the site.

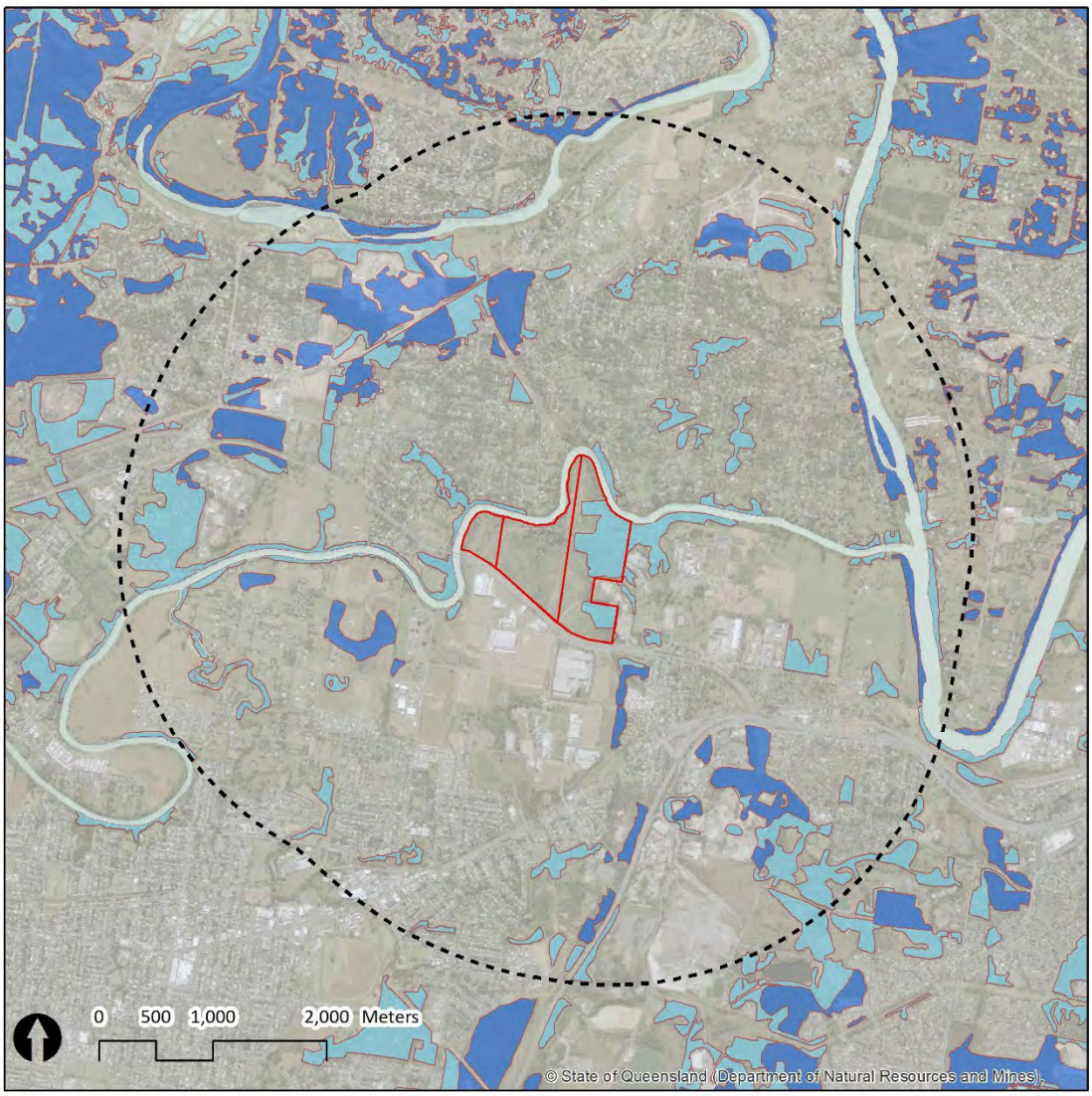


FIGURE 16: REGULATED VEGETATION WITHIN 3KM OF THE SITE BOUNDARY (NEARMAP 2023; DEPARTMENT OF RESOURCES 2024).

5.7 SUMMARY

Overall results of the ecological assessment indicate that the existing environment could be summarised as follows:

- The landform pattern can be described as undulating rises (UR) according to the National Committee on Soil and Terrain (2009), with much of the land lying between 10m and 30m AHD.
- The geology of the site is a mixture of Redbank Plains Formation, Tivoli Formation, second river terraces and stranded river terraces.
- The site is located on the Bremer River and is approximately 72 km upstream from Moreton Bay.
- The waterway running through the site was in a degraded condition (degraded banks (agistment), weed dominated and poor visibility).
- Botanical assessment results suggested that vegetation on the site could be classified into four (4) distinct VSUs:
  - VSU 1: Open grassland, dominated by exotic species, generally devoid of native trees or with few scattered native trees.
  - VSU 2: Regrowth Regional Ecosystem (RE) 12.9-10.2 (least concern). *Corymbia citriodora subsp. variegata* +/- *Eucalyptus crebra* open forest on sedimentary rocks.
  - VSU 3: Regrowth RE 12.3.3 (endangered). *Eucalyptus tereticornis* woodland on Quaternary alluvium.
  - VSU 4: Regrowth RE 12.3.7 (of concern). *Eucalyptus tereticornis*, *Casuarina cunninghamiana* subsp. *cunninghamiana* +/- *Melaleuca* spp. fringing woodland.
- A total of 82 species of fauna were recorded within the survey area during the ecological assessment.
- Species observed included both ubiquitous urban fauna as well as those usually associated with larger patches of woodland vegetation and riparian/aquatic habitats.
- The Grey-headed Flying-fox was observed flying over the site. Apart from this observation, no other direct or indirect evidence of threatened fauna species was observed as part of the field investigations, including no evidence of koalas.
- Fauna habitat suitability assessment was undertaken for threatened species known, or likely, to utilise or occupy the site. Results indicated that the majority of potential species are unlikely to utilise or occupy the site, on account of an absence of any appropriate habitat on or in the vicinity of the site.

6 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

This section of the report addresses all MNES including threatened species and ecological communities that have the potential or are likely to be present in the vicinity of the proposed action site or surrounding areas based on the understanding of existing environments and habitat features per Section 5. It provides details on:

- Previous assessment and reporting, and
- Further assessment.

6.1 PREVIOUS ASSESSMENT AND REPORTING

6.1.1 METHODS

MNES that pertain to the proposed action were assessed at the referral stage in the MNES Report (Appendix 2). The MNES report detailed desktop and field investigation methods to determine the likelihood that MNES or their habitat might occupy the site. The likelihood assessment is based on:

- Desktop assessments:
  - Protected Matter Search Tool (PMST) results (Appendix 9),
  - WildNet online results (Appendix 9),
  - Assessment of habitat on the site, and
  - And a heuristic assessment decision model (Appendix 9).
- On ground surveys (refer to Section 4.1).
- Overall assessment of likelihood based on a combination of each of the above.

Refer to the MNES report for more detailed information on the methods of assessment (likelihood assessment) for MNES on the site (Appendix 2, Section 6).

The likelihood assessment was re-visited for the PD Report to ensure that the assessment was contemporary and accurate, utilising the aforementioned methods and resources. In the updated likelihood assessment for the PD report, an additional column was included with a justification of the likelihood assessment decisions.

Refer to Appendix 9 for the updated likelihood assessment.

6.1.2 RESULTS

The results of the updated likelihood assessment determined that the following species could occur on or nearby to the site:

- Flora species:
  - *Notolaea ipsviciencis* or Cooneana Olive was likely to occur,
  - *Notolaea lloydii* or Lloyd's Olive was likely to occur,
- Fauna species:
  - The GHFF was confirmed (observed flying over the site), and
  - Five (5) species could possibly utilise the site:
    - *Hirundapus caudacutus* or White-throated Needletail,
    - *Rhipidura rufifrons* or Rufous Fantail,
    - *Petauroides volans* or Greater Glider,
    - *Phascolarctos cinereus* or Koala, and,
    - *Furina dunmalli* or Dunmall's Snake.

There was no change between species that could possibly occur, were likely to occur or were confirmed to occur on the site between the MNES report (Appendix 2) and the revision of the likelihood assessment for this PD Report (Appendix 9).

An assessment against the significant impact criteria was carried out for all the above species in the MNES report. The assessment concluded that significant impacts of the proposed action on any of the above-listed species were unlikely.

A delegate of the Minister then made the referral decision that the Citiswich Stage 7 proposed action was a controlled action to be assessed by Preliminary Documentation (under sections 75 and 87 of the EPBC Act) for likely significant impacts on threatened species, namely the GHFF. As such, the Grey-headed Flying-fox has been further assessed to investigate potential significant impacts on the species.

6.2 FURTHER ASSESSMENT OF THE GREY-HEADED FLYING-FOX

Further detailed assessment was completed for the GHFF due to the possibility of significant impacts on the species. Sufficient fieldwork had been completed; however, further desktop assessment was required to refine the understanding of habitat values and context in relation to the Stage 7 development site.

6.2.1 METHODS

Litoria completed additional detailed assessments of the species' likelihood, preferences, threats and quality of habitat to determine significant impacts on the species. An additional desktop review was conducted to refine the assessment of potential impacts. These methods are supplementary to those in the MNES report (Litoria Consulting, February 2023).

The following databases, resources and desktop methods were applied to the desktop study of the species:

- Review of the Commonwealth Government's National Flying Fox Monitoring Viewer,
- Review of the GHFF National Recovery Plan,

- Review of vegetation characteristics within the foraging radius of the site utilising the Regulated Vegetation Management map (Department of Resources 2024),
- Assessment of critical habitat, and
- Review of peer-reviewed literature in regard to species habitat requirements and threats.

6.2.2 RESULTS

The GHFF is listed as Vulnerable under the EPBC Act (effective 6 December 2001). The GHFF is endemic to Australia, and although once widespread, the species range is contracting in the east coast, with a distribution ranging roughly from Bundaberg in Queensland to Melbourne in Victoria (Threatened Species Scientific Committee 2001a). The GHFF lives in roosts (or camps) and flies to forage on the blossoms and fruits of native trees, as well as commercial and backyard crops. Results of the Protected Matter Search Tool (PMST) indicate that *roosting is known to occur within the area.*

The following section provides an assessment of species ecology, distribution, habitat preferences and threats in the context of the impact site to determine if the site is habitat critical to the survival of the species. The results are separated into the following key sections:

- Habitat assessment,
- Evidence of occurrence,
- Threats to the species, and
- Assessment of critical habitat.

6.2.2.1 HABITAT ASSESSMENT

The GHFF is a canopy-feeding frugivore and nectarivore in vegetation communities including rainforests, open forests, closed and open woodlands, *Melaleuca* swamps and *Banksia* woodlands, as well as commercial fruit crops and introduced tree species in urban areas. (Department of Agriculture Water and the Environment 2021). The GHFF is highly mobile, and the national population is fluid, moving up and down the east coast in response to transient and seasonal food resources. The GHFF is considered one population due to a high capacity for dispersal, frequent genetic mixing and a unified distribution (Department of Climate Change Energy the Environment and Water 2022).

The primary food resource for the GHFF is blossoms from *Eucalyptus* and related genera. Native food trees include the fruit and blossom of native fruiting species, especially *Ficus* spp., and blossoms of myrtaceous species such as *Eucalyptus, Corymbia* and *Angophora, Melaleuca*, *Banksia* and the fruit and flowers of *Syzygium spp* (Department of Agriculture Water and the Environment 2021).

None of the vegetation communities used by the GHFF produce continuous foraging resources throughout the year. As a result, the species has adopted complex migration traits in response to ephemeral and patchy food resources (Department of Agriculture Water and the Environment 2021). The GHFF have no biological adaptations to withstand

food shortages (e.g. torpor) and instead migrate in response to changes in the quantity and location of food (Department of Agriculture Water and the Environment 2021).

Citiswich is predominantly disturbed however, regrowth vegetation remaining on the site includes canopy species known to be foraging resources for the GHFF, including *Eucalyptus* spp. and *Corymbia* spp. The total area of available foraging habitat for the species on the site at Citiswich is contained in Vegetation Survey Units (VSUs) one (2), two (2), three (3) and four (4), totalling 34.7 ha (prior to the action). The VSUs that comprise foraging habitat are Regional Ecosystem (RE) 12.3.3. (*Eucalyptus tereticornis* woodland on Quaternary alluvium), 12.9-10.2 (*Corymbia citriodora subsp. variegata +/- Eucalyptus crebra* open forest on sedimentary rocks), and 12.3.7 (*Eucalyptus tereticornis* woodland on Quaternary alluvium). Refer to Table 4 for a breakdown of habitat on the site. Refer to Figure 11 for a map of the vegetation survey units.

TABLE 4: GREY-HEADED FLYING-FOX HABITAT ASSESSMENT AND IMPACT AREAS ON THE CITISWICH SITE.

VSU	Description	Habitat type	Habitat (ha)	Habitat impact (ha)
1	Open grassland, dominated by exotic species, generally devoid of native trees or with few scattered, native trees.	Not habitat	-	-
2	Regrowth Regional Ecosystem (RE) 12.9-10.2 (least concern). *Corymbia citriodora subsp. variegata +/- Eucalyptus crebra* open forest on sedimentary rocks.	Foraging habitat	13.2	12.7
3	Regrowth RE 12.3.3 (endangered). *Eucalyptus tereticornis* woodland on Quaternary alluvium.	Foraging habitat	13.4	2.2
4	Regrowth RE 12.3.7 (of concern). *Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca* spp. fringing woodland.	Foraging habitat	8.1	2.5
Total area			**34.7**	**17.4**

6.2.2.2 EVIDENCE OF OCCURRENCE

A combination of field and desktop evidence has been utilised to assess the presence of the species on or nearby to the site at Citiswich. Across numerous sources, the mean distance from a foraging site to the camp in which the animal had roosted and to which it returned is 15-20 km (Threatened Species Scientific Committee 2001b; Boardman *et al.*

[2] Four (4) VSUs comprise vegetation on the site. The VSUs were identified utilising the *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland. Neldner, V. J., B. A. Wilson, H. A. Dillewaard, T. S. Ryan, D. W. Butler, W. J. F. McDonald, E. P. Addicott and C. N. Appelman (2022). Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 6.0. Q. Herbarium. Brisbane, Queensland Department of Environment and Science..*

2021; Department of Agriculture Water and the Environment 2021; Department of Climate Change Energy the Environment and Water 2022). As such, a buffer of 20 km has been applied to the site to assess the presence of roosts nearby to the site from which individuals may use the Stage 7 site for foraging.

The CSIRO has developed a scientifically rigorous monitoring methodology to gather updated information about the status of the national GHFF population counts and trends using a method of annual census on all known GHFF roosting locations. The data is available via the interactive mapping system, the National Flying-fox Monitoring Viewer (Australian Government 2022). Utilising this database, it is evident that within a 20 km dispersal buffer of the site, there are 16 roosts that have been used either permanently or intermittently by the GHFF in the past five (5) years (between 2018 and 2022) (Australian Government 2022). The roosts exist predominantly in built-up areas in close proximity to riparian corridors and tributaries. One of the 16 roosts surrounding the site is a Nationally Significant Roost[3] located at Mt Ommaney, which is within 10km of the Stage 7 site. This roosting location has annually supported between 500 and 50,000 individuals every year during census surveys over the past 10 years (since 2012) (Figure 10).

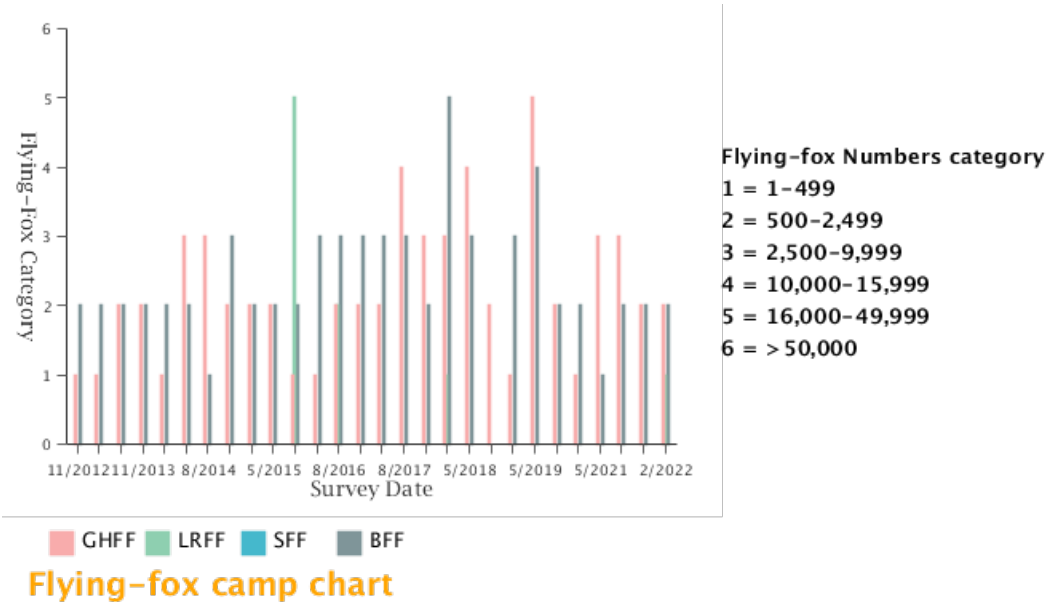


FIGURE 17: GREY-HEADED FLYING-FOX POPULATION COUNTS (RED) AT THE NATIONALLY SIGNIFICANT ROOST AT MT OMMANEY (AUSTRALIAN GOVERNMENT 2022)

Maxent modelling of potential habitat for the GHFF conducted by the Queensland Government (Queensland Herbarium 2022) was assessed in regard to the site and

[3] Nationally important camps or Nationally significant roosts are those roosts that have contained ≥ 10,000 Grey-headed Flying-foxes in more than one year in the last 10 years or have been occupied by more than 2,500 Grey-headed Flying-foxes permanently or seasonally every year for the last 10 years (Department of Agriculture Water and the Environment (2021). National Recovery Plan for the Grey-headed Flying-fox 'Pteropus poliocephalus').

surroundings. Potential habitat models aim to predict the probable distribution of suitable species' habitats based on input variables likely to test their biological tolerance and pre-clearing habitat requirements (Queensland Herbarium 2022). For this reason, caution must be exercised when considering the extent of potential habitat in non-remnant landscapes. As a result, the GHFF predictive habitat model was clipped to remnant habitat, which provides a conservative estimate of current habitat availability according to the model methodology (Queensland Herbarium 2022). This maxent modelling within 20 km of the site and beyond is displayed in Figure 11, along with the location of roosts. The maxent modelling demonstrates that remnant high-quality habitat is mapped in patches predominantly to the north and south of roost locations.

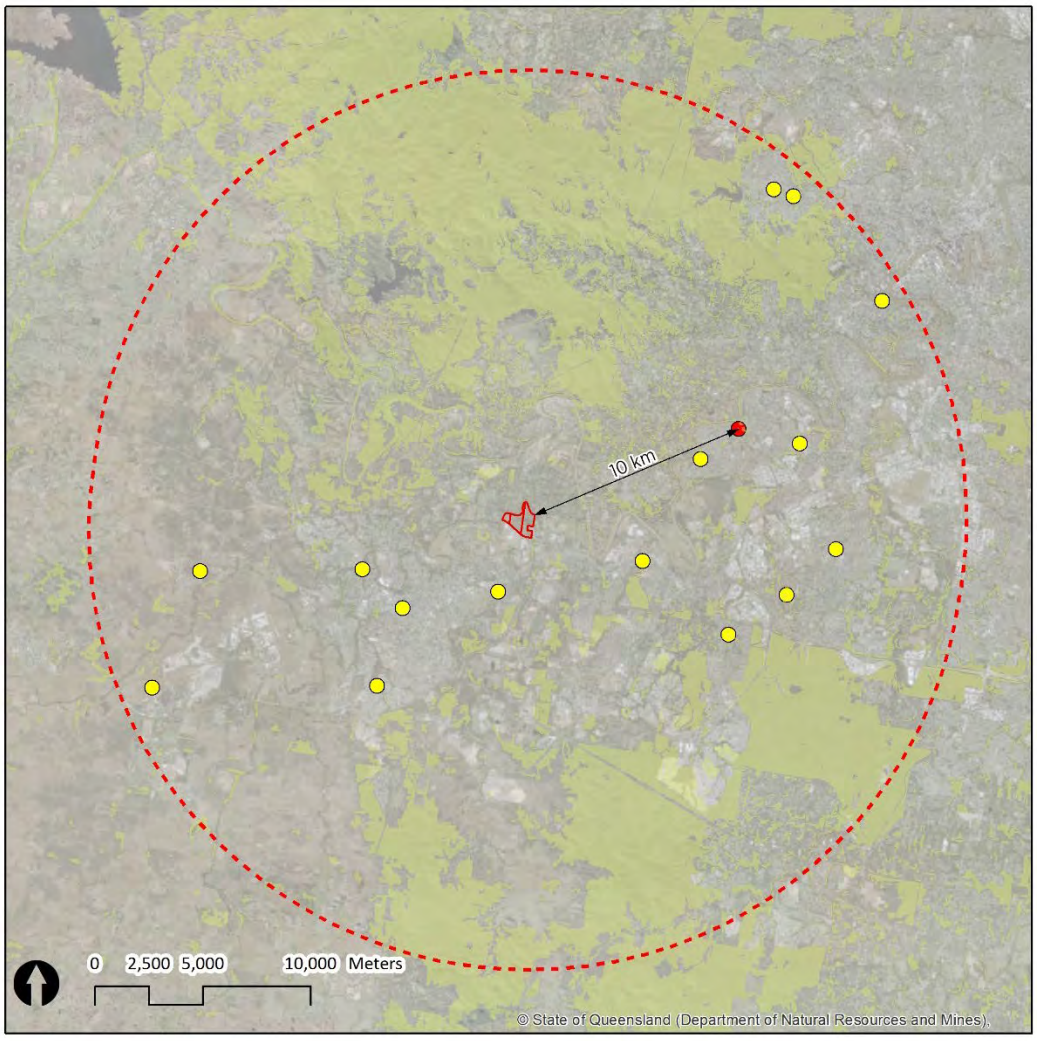


FIGURE 18: ROOSTS USED BY THE GHFF WITHIN 20 KM OF THE SITE EITHER INTERMITTENTLY OR PERMANENTLY SINCE 2017 AND MAXENT HIGH-QUALITY PREDICTIVE HABITAT MAPPING (AUSTRALIAN GOVERNMENT 2022; QUEENSLAND HERBARIUM 2022).

6.2.2.3 THREATS

There are several threats to the survival of the GHFF, a few of which are present on the Stage 7 site. Refer to Table 2 below for a literature review of varying threats to the GHFF, including details of how the threat affects the species and the severity of the threat to the species.

TABLE 5: SUMMARY OF THREATS TO THE SURVIVAL OF THE GREY-HEADED FLYNG-FOX.

Threats	Implications
Heatstroke	Flying-foxes are susceptible to heat stress due to their inability to sweat, therefore they need to expend energy on cooling mechanisms such as fanning. Temperatures above 38ºC, consecutive hot days, lactation and camp demographics contribute to heat stress. A flying-fox is considered to be suffering from heat stroke once fanning and shade-seeking are no longer effective, resulting in severe exhaustion and damage to bodily systems. Exertional heat stroke can lead to systemic health damage and death.
Habitat loss	The species has complex habitat requirements including multiple populations of food trees dispersed over a large area. This makes it difficult to protect foraging habitats solely within conservation reserves, such as national parks, and leaves the species vulnerable to land uses that may clear native vegetation or degrade habitat (Department of Agriculture Water and the Environment 2021). Loss of winter foraging food trees for the GHFF is of high concern. Winter creates a resource bottleneck for the species, and they have no physical adaptations to survive food shortages. Scarce food resources can impact fitness and fecundity.
Light	Natural light is a stimulus that influences the behaviours and physiology of all organisms, and artificial lighting can alter natural signals. Artificial light is a known influence on the GHFF, where streetlights, spotlights, headlights, flashing beacons, traffic and skyglow at night have the potential for behavioural effects on the GHFF due to their nocturnal nature (Ecosure Pty Ltd 2021). Although the impacts on frugivores are not as significant as insectivores, evidence suggests light pollution has caused frugivorous bats to abandon traditional commuting routes and potentially deterred them from reaching their preferred foraging habitat. However, the GHFF is known to camp in light-drenched areas, and are overall relatively tolerant of light when compared to other bat species (Ecosure Pty Ltd 2021).
Noise	Noise in excess is a known impact on the GHFF, where loud, sustained or sudden noises can have negative implications on communication behaviour including cessation of social communication in roosts. Noise that is significantly in excess (~100%) of the sound produced by roosts is the threshold of impact for cessation (Ecosure Pty Ltd 2021). Sudden noises or sustained noises (i.e., aeroplanes) can also cause panic-induced flying when roosting and foraging, as well as stress effects (Ecosure Pty Ltd 2021)
Dust	Dust has a known impact on the GHFF, which is thought to be due to the assumption that they locate food primarily via olfactory rather than visual senses (Ecosure Pty Ltd 2021). Scent from food sources may be reduced requiring additional travel distance to find uncontaminated food sources, with fitness consequences due to increased energy expenditure sourcing food (Ecosure Pty Ltd 2021).
Entanglement	GHFF injury and death can occur from contact with various types of infrastructure occurring in urban and rural landscapes. According to the national Recovery Plan, 532 records from two wildlife hospitals saw anthropogenic factors (63.7%) as a major cause of flying-fox admissions with entanglement in fruit netting the most significant risk for bats (Department of Agriculture Water and the Environment 2021).
Cumulative impacts	Impacts on the GHFF may be greater if an action is proposed during a time of population stress (e.g., food shortage) or during extreme weather (which might exacerbate heat events). GHFF are extremely vulnerable to temperatures above 38°C and have suffered widespread mass mortality when temperatures reach 42°C (Ecosure Pty Ltd 2021).

On the site at Citiswich, the GHFF is subject to a few pre-existing threats, including:

- Barriers to movement, including:
  - Power lines,
  - Transmission towers, and
  - Barbed wire fences.
- Light, noise and dust pollution, including:
  - The Warrego Highway, and
  - Surrounding residential and industrial land use.

6.2.2.4 ASSESSMENT OF HABITAT CRITICAL TO THE SURVIVAL OF THE SPECIES

Habitat critical to the survival of the GHFF is defined in the National Recovery Plan (Department of Agriculture Water and the Environment 2021). Critical habitat includes vegetation communities that support scarce winter and spring flowering food resources, including the following blossoming trees:

- *Eucalyptus tereticornis,*
- *Eucalyptus albens,*
- *Eucalyptus crebra,*
- *Eucalyptus fibrosa,*
- *Eucalyptus melliodora,*
- *Eucalyptus paniculata,*
- *Eucalyptus pilularis,*
- *Eucalyptus robusta,*
- *Eucalyptus seeana,*
- *Eucalyptus sideroxylon,*
- *Eucalyptus siderophloia,*
- *Banksia integrifolia,*
- *Castanospermum australe,*
- *Corymbia citriodora,*
- *Corymbia eximia,*
- *Corymbia maculata,*
- *Grevillea robusta,*
- *Melaleuca quinquenervia, and*
- *Syncarpia glomulifera*

Habitat critical to the survival of the GHFF may also be vegetation communities not containing the above tree species but which (Department of Agriculture Water and the Environment 2021):

1. *Contain native species that are known to be productive as foraging habitats during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May)*
2. *Contain native species used for foraging and occur within 20 km of a nationally important camp as identified on the Department's interactive flying-fox web viewer, or*

3. *Contain native and or exotic species used for roosting at the site of a nationally important GHFF camp as identified on the Department's interactive flying-fox web viewer.*

The vegetation on site that is considered habitat (Table 1) was assessed against the above criteria for critical habitat. See Table 3 for the results of the assessment.

TABLE 6: ASSESSMENT OF HABITAT CRITICAL TO THE SURVIVAL OF THE SPECIES ON STAGE 7.

Criteria for habitat critical to the survival of the species	Assessment of critical habitat for the species on the Stage 7 site
Contains vegetation that is known to support trees that are productive foraging food trees in Winter (within the species distribution).	• VSU 2 contains: - *Eucalyptus tereticornis* - *Corymbia citriodora,* - *Eucalyptus siderophloia,* and - *Eucalyptus crebra.* • VSU 3 contains: - *Eucalyptus tereticornis,* and - *Eucalyptus siderophloia.* • VSU 4 contains: - *Eucalyptus tereticornis* - *Corymbia citriodora,* - *Eucalyptus siderophloia,* and - *Eucalyptus crebra.*
Contain native species that are known to be productive as foraging habitats during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May).	
Contains native species used for foraging and occurs within 20 km of a nationally significant roost as identified on the Department's interactive flying-fox web viewer.	VSUs 2, 3 and 4 contain native species used for foraging. The site is 10 km from a nationally significant roost.
Contain native and or exotic species used for roosting at the site of a nationally important GHFF camp as identified on the Department's interactive flying-fox web viewer.	The site does not contain roosting habitat.

In summary, the site is known to support winter and spring flowering food resources and is located within close proximity to several GHFF roosts including a Nationally Significant Roost, therefore, the vegetation is a critical habitat for the species.

7 IMPACT IDENTIFICATION

The purpose of this section of the report is to identify potential development impacts that would occur without management measures in place. As the delegate of the Minister for the Environment has decided that the proposed action is likely to have a significant impact on the GHFF, the identification of potential development impacts is directly related to this species and the habitat values of the site and indirectly related to threatened species and communities.

Where relevant, management measures that address the identified impacts are referenced from Section 9. The following section identifies both direct and indirect impacts on the aforementioned species that will occur within each stage of the development (i.e., pre-construction, construction and post-construction).

The following sections address the impacts of the proposed development including:

- Direct impacts; including:
  - Native vegetation; and
  - Overall assessment;
- Indirect impacts; including:
  - Edge effects;
  - Flooding; and
  - Overall assessment.

7.1 DIRECT IMPACTS

The following sections address the direct impacts of the proposed development including:

- Assessment of impacts to native vegetation, and
- Overall assessment.

7.1.1 NATIVE VEGETATION

The total proposed action (70.0 ha) is comprised of the following:

- Development footprint (68.8 ha); and
- The haul road (1.2 ha).

Excluding the haul road, spatial analysis indicates that the total Stage 7 site consists of the following areas:

- Approximately 68.8 ha for mixed-use development; and
- Approximately 43.2 ha of balance land to be dedicated to Council as parkland as per condition 23 of the Preliminary Approval for Material Change of Use component of permit 3356/2002/CA (Appendix 5 – Relevant Approval).

Including the haul road, the proposed development footprint includes:

- Approximately 17.4 ha of native regrowth woodland or forest, and
- Approximately 52.6 ha of already disturbed and/or cleared.

The site currently contains 34.7 ha of native vegetation. Although 17.4 ha of this will be cleared, 17.3 ha of vegetation will be retained in open space areas. The open space areas will be dedicated as parkland to the City of Ipswich, and the Council will be responsible for ongoing management activities. Open space areas will be left in-situ and weeds will be managed. The proponent will be responsible for the management of open space for a potential currency period of 18 months, after which the protection of open space areas will be the responsibility of the City of Ipswich. Treatment of open space areas can be found in Appendix 7: Andrew Gold Landscape Architecture Archer Street Park and Citiswich Stage 7 Landscape Masterplan Issue S (03/05/2024).

A map of the native vegetation retained and removed is displayed in Figure 19 below.

FIGURE 19: NATIVE VEGETATION RETAINED AND REMOVED.

7.1.2 OVERALL ASSESSMENT

The following section provides a detailed assessment of the nature, timing, duration and magnitude of direct impacts for pre-construction, construction and post-construction

development phases. The following section provides guidance to management measures proposed to avoid, minimise and mitigate the impacts of the proposed development on ecological features.

The table below assesses the magnitude of the impact of activities associated with the proposed action (prior to management and mitigation measures). Note that, in the absence of local authority operational approval, duration and frequency of impacts have been indicated in place of specific start times which are not yet available. The magnitude of impacts are a product of:

- Time (duration and frequency) over which the impact occurs;
- Area of impact;
- Severity of impact the impact occurred; and,
- Likelihood of impact.

TABLE 7: ASSESSMENT OF DIRECT IMPACTS

Activity	Potential Impact	Duration and frequency	Area	Severity	Likelihood	Management measures
Pre-construction						
Soil or land disturbance for site assessments (i.e., boring for engineering surveys)	• Potential injury or mortality to fauna • Potential destruction of fauna habitat	• Short-term • Infrequent • Ongoing from 2025 to 2027	Localised • Consolidated to areas of existing disturbance/clearing. A small area of effect	High • Irreversible • Impact is likely to be on an individual rather than on a population or the species as a whole	Unlikely • Limited duration and area of impact • Impacts on being located in existing disturbance/clearing.	Refer to items 2, 8, 9, 15, 16 and 17 of Table 9
Maintenance and clearing of existing access tracks	• Potential injury or mortality to fauna • Potential destruction of fauna habitat	• Ongoing • Repeated • Small area of effect • Ongoing from 2025 to 2027	Localised • Limited to existing access tracks with no mature native vegetation currently existing	Low • Low-risk activity (i.e., mowing and pruning)	Unlikely • Limited area of impact • Impacts on being located in existing disturbance/clearing.	Refer to items 2, 3, 6 – 9, 11, 15, of Table 9
Vegetation clearing	• Potential injury or mortality to fauna • Destruction/removal of fauna foraging habitat or shelter habitat • Fragmentation of habitat • Increased risk of stress on individuals	• To occur on a staged basis subject to council approvals over smaller areas and longer duration • Ongoing from 2025 to 2027	• 17.4 ha of native vegetation clearing indicated in the habitat impact drawing (Figure 12).	High • Irreversible • Permanent impacts on habitat • Potential direct injury to individuals	Certain • Loss of habitat and shelter values Unlikely • Direct injury to fauna is unlikely with proposed management measures. • Reduced by proposed vegetation clearing staging	Refer to items 2, 3, 6 – 9, 11, 15, of Table 9
Introduction of pest species	• Predation of native fauna	• May occur at any stage during 2025-2027, to	• Not predictable – the scope of impact for pests varies for the	Medium • Potentially long-term impacts on ecosystem	Possible • Reduced by proposed management measures.	Refer to items 16 and 17 of Table 9

Activity	Potential Impact	Duration and frequency	Area	Severity	Likelihood	Management measures
	• Thickening of understorey, reducing foraging opportunities • Competition for resources • Lethal ingestion	be monitored at all times. • May be repeated due to the high volume of people and vehicles.	type and status of the invasive taxa.	function and composition • Understorey vegetation on site already dominated by exotic species		
Construction						
Construction, excavation, and other land disturbances (i.e., excavation, frequent vehicle usage, heavy machinery)	• Potential injury or mortality to fauna. • Increased risk of stress on individuals and entrapment of individuals.	• Ongoing from 2025 to 2027 • To occur on a staged basis subject to council approvals over smaller areas and longer duration	• Within the approved development footprint • Large-scale, over stages	High • Irreversible • Impact is likely to be on an individual rather than on a population or the species as a whole	Unlikely • Reduced by proposed construction staging • Reduced by proposed best practice construction management measures	Refer to items 20, 22 and 23 of Table 9
Introduction of pest species	• Predation of native fauna • Thickening of understorey, reducing foraging opportunities • Competition for resources • Lethal ingestion	• May occur at any stage during 2025-2027 • May be repeated due to the high volume of people and vehicles.	• Not predictable – the scope of impact for pests varies for the type and status of the invasive taxa.	Medium • Potentially long-term impacts on ecosystem function and composition • Understorey vegetation on site already contains dominant exotic species	Possible • Reduced by proposed management measures	Refer to item 21 of Table 9

Activity	Potential Impact	Duration and frequency	Area	Severity	Likelihood	Management measures
Post-construction						
Increased vehicle traffic	• Potential injury or mortality to fauna by vehicle strike.	• Ongoing from 2027 • Frequent	• Vehicle access is limited to approved roads.	High • Irreversible • Impact is likely to be on an individual rather than on a population or the species as a whole	Unlikely • Reduced by proposed management measures	Refer to item 29 of Table 9
Introduction of pest species	• Predation of native fauna • Thickening of understorey, reducing foraging opportunities • Competition for resources • Lethal ingestion	• May occur at any stage. • May be repeated due to the high volume of people and vehicles. • Ongoing from 2027	• Not predictable – the scope of impact for pests varies for the type and status of the invasive taxa.	Medium • Potentially long-term impacts on ecosystem function and composition • Understorey vegetation on site already contains dominant exotic species	Possible • Reduced by proposed management measures. • Reduced by the separation of vegetation and development, and proper vehicle roads. • Reduced by the pre-existing weed content (worsening unlikely).	Refer to item 27 of Table 9
Barriers to Movement	• Entanglement and injury • Impediment of dispersal • Fragmentation effects	• Ongoing from 2027	• Infrastructure, roads and fencing create barriers to movement. • The location of developments are indicated in Figure 5. • Fencing will be located at lot boundaries.	Low • The area already contains a high density of urban/industrial development, fencing and fragmentation. • Additional barriers are not likely to significantly worsen pre-existing impacts.	Certain • Although new barriers, being roads and fences are certain, the area already contains barbed wire fencing, a high density of obstructive weeds (*lantana* and *harissa*) and worsening of impacts is not likely.	Refer to item 30 of Table 9

7.2 INDIRECT IMPACTS

The following section provides more information on potential indirect impacts of the proposed development, including:

- Edge effects and connectivity,
- Flooding, and
- Overall assessment.

7.2.1 EDGE EFFECTS AND CONNECTIVITY

Noise, vibration, dust and light emissions are possible on neighbouring vegetation without mitigation measures. Vegetation clearing will alter the configuration and location of edge effects. Refer to Figure 20 for the location of new and/or altered edge effects resulting from the proposed action.

Edge effects may be associated with:

- Increased weed presence;
- Increased risk of stress on individuals and displacement of species; and
- Altered behaviour (i.e., reduced ability to forage, breed, navigate and avoid predators).

Vegetation is primarily separated from proposed developments by open space areas which act as natural landscape buffers. In locations where vegetation is adjacent to developments, there are perimeter and access roads that provide a transitional zone between industrial lots and vegetation. The presence of low-level bushfire risk (Section 3.2.7) means that industrial buildings on lots near vegetation are required to be built outside of a certain buffer to vegetation that is between 19 and 23m away, therefore location noise and light pollution risks away from vegetation and providing further buffers between vegetation and buildings.

Connectivity between habitat areas is maintained along the Bremer River and to neighbouring properties due to the retention of habitat along the northern property boundary. This provides terrestrial connectivity between the Stage 7 site and neighboring properties along the boundary of the Bremer River on the side of the proposed development.

Refer to Section 9, specifically, Table 12 for measures to avoid, minimise and mitigate edge effects on the target MNES such that there is no worsening of edge effects for MNES on the site.

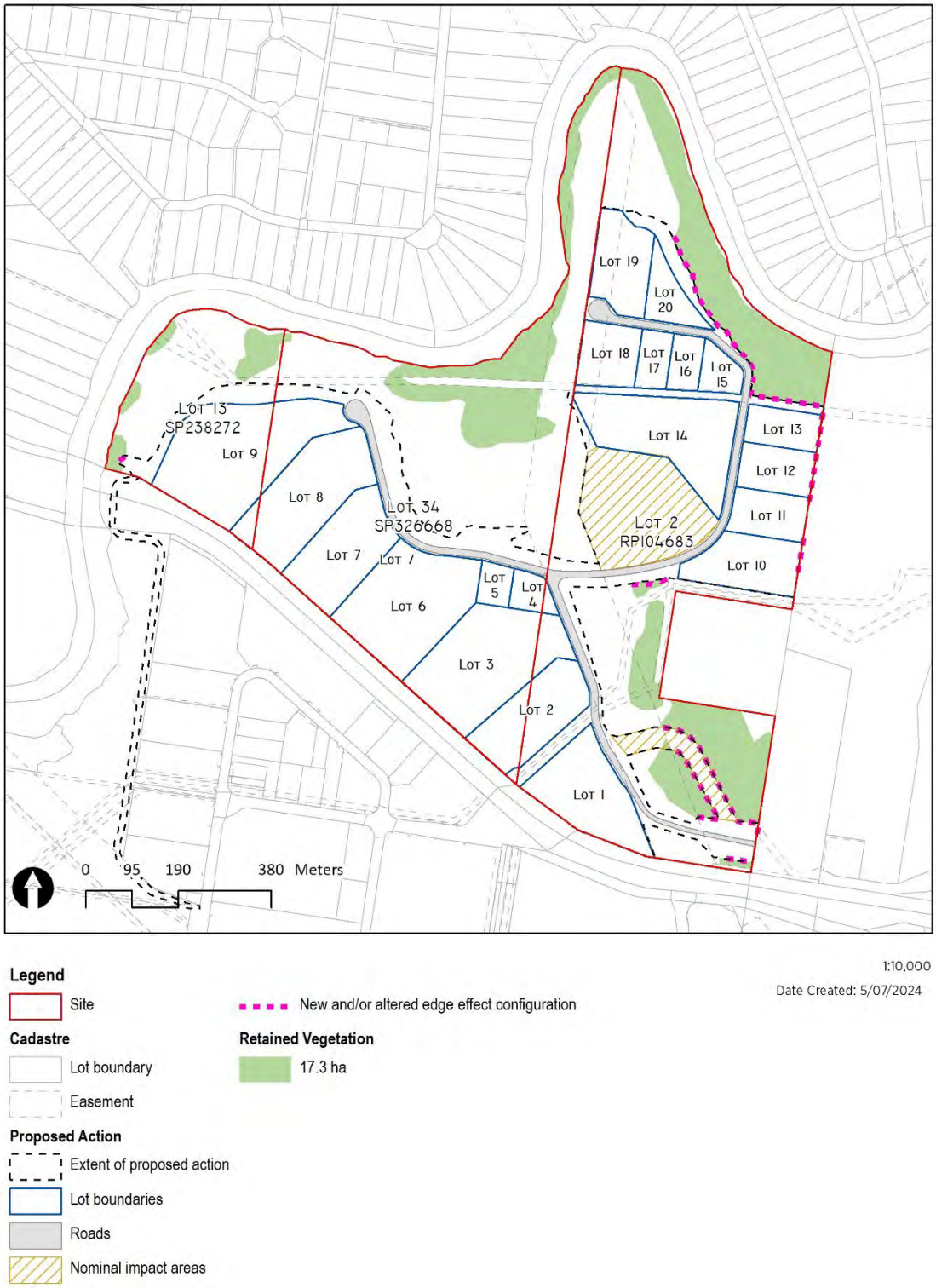


FIGURE 20: LOCATION AND CONFIGURATION OF NEW AND/OR ALTERED EDGE EFFECTS.

7.2.2 FLOODING

Flooding is a pre-existing environmental factor on the Stage 7 site. In terms of flooding levels, the 1% annual exceedance probability (AEP) sits at 18.73 metres above mean sea level or Australian Height Datum (AHD), and the 5% AEP event sits at approximately 11.5m

AHD. No exacerbation of flood levels will occur as part of the proposal, as pre- and post-development levels are within 10cm of each other. Refugia is available to species even in the worst-case flood outcome (3.1 ha of refugia).

Refer to the flood report prepared by Alan and Dennis, which has been submitted as part of a Reconfiguring a Lot (RAL) and Operational Works (OPW) application to the Council (Appendix 4) for more information on flooding. Refer to Figure 21 for a map of the proposed development footprint and the 1% and 5% AEP flood event refugia.

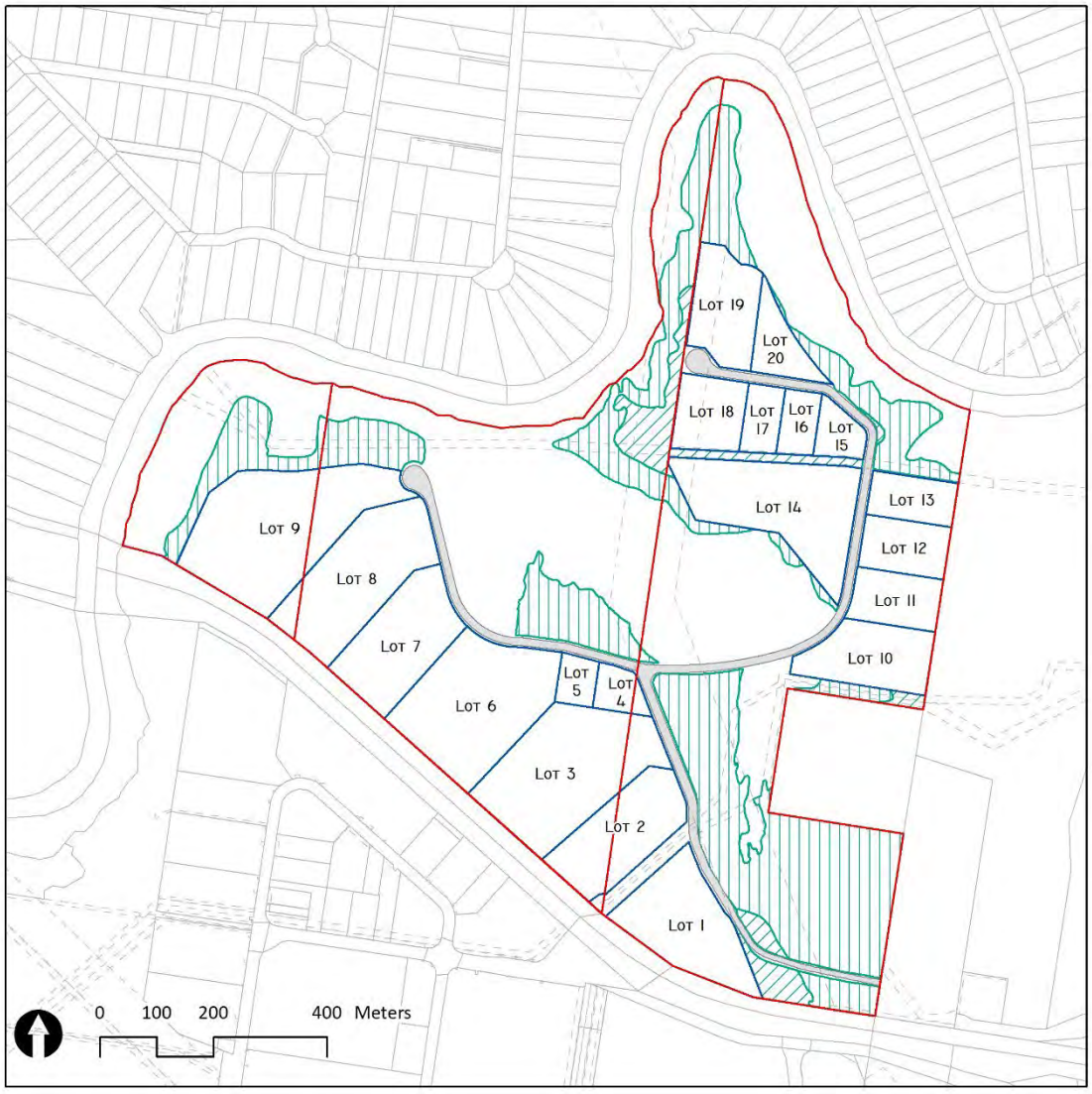


FIGURE 21: FLOOD REFUGIA PER 1% AND 5% AEP EVENTS.

7.2.3 OVERALL ASSESSMENT

The following section provides a detailed assessment of the nature, timing, duration and magnitude of indirect impacts for pre-construction, construction and post-construction development phases. The following section provides guidance to management measures

in further resections of the report to avoid, minimise and mitigate impacts of the proposed development on ecological features.

The table below assesses the magnitude of the impact of activities associated with the proposed action (prior to management and mitigation measures), which is a product of the:

- Time (duration and frequency) over which the impact occurs;
- Area of impact;
- Severity of impact the impact occurred; and,
- Likelihood of impact.

TABLE 8: ASSESSMENT OF INDIRECT IMPACTS

Activity	Impact	Duration and frequency	Area of impact	Severity of impact	Likelihood	Management measures
Pre-construction						
Soil degradation (i.e., erosion, water runoff, sedimentation, nutrient loss)	• Reduced quality and availability of habitat	• Short-term • Infrequent • Ongoing from 2025 to 2027	Localised • Consolidated to areas of existing disturbance/clearing	Medium • Reversible	Unlikely • Limited duration and area of impact	Refer to items 7, 13 and 14 in Table 9
Vegetation clearing	• Reduced habitat patch size and availability of habitat • Increased habitat patch perimeter to area ratio (i.e., increased edge effects) • Reduced protection from threats (i.e., protection from feral predators)	• To occur on a staged basis subject to council approvals over smaller areas and longer duration • Ongoing from 2025 to 2027	• 17.4 ha of native vegetation clearing indicated in the habitat impact drawing (Figure 12).	High • Irreversible • Can exacerbate other threats (i.e., invasive species)	Possible • Reduced patch size and availability of habitat • Edge effects not likely to increase (development is adjacent to existing disturbance areas) • Threats are already present on-site	Refer to items 2, 4, 6 – 12, 15, in Table 9
Noise and vibration emissions	• Increased risk of stress on individuals and displacement of species • Altered behaviour (i.e., reduced ability to forage, breed, navigate and avoid predators)	• Short-term, likely to be associated with vehicles and clearing • Ongoing from 2025 to 2027, daylight hours only	• Site and neighbouring sites	Medium • Temporary • Can result in decreased species abundance in areas of noise pollution.	Unlikely • Management will reduce the likelihood of impacts • Some level of noise is already present on the site (adjacent to the Warrego Highway)	Refer to item 10 in Table 9

Activity	Impact	Duration and frequency	Area of impact	Severity of impact	Likelihood	Management measures
Dust / particulate emissions	• Increased risk of stress on individuals and displacement of species • Altered behaviour (i.e., reduced ability to forage, breed, navigate and avoid predators)	• Short-term, likely to be associated with vehicles and clearing • Limited to early 2025-2027	• Site and potentially neighbouring sites	Medium • Temporary	Unlikely • Management will reduce the likelihood of impacts	Refer to items 13 and 14 in Table 9
Construction						
Soil degradation (i.e., erosion, water runoff, sedimentation, nutrient loss)	• Reduced quality and availability of habitat	• Short-term, between 2025-2027 • Temporary	Localised • Consolidated the development footprint	Medium • Reversible	Unlikely • Limited duration and area of impact	Refer to items 20, 22, 23, and 26 in Table 9
Noise and vibration emissions	• Increased risk of stress on individuals and relocation of species • Altered behaviour (i.e., reduced ability to forage, breed, navigate and avoid predators)	• Short-term, likely to be associated with vehicles and construction • Limited to early 2025-2027, daylight hours only	• Site and neighbouring sites	Medium • Temporary • Can result in decreased species abundance in areas of noise pollution.	Unlikely • Management will reduce the likelihood of impacts • Some level of noise is already present on the site (adjacent to the Warrego Highway) •	Refer to items 20 and 25 in Table 9
Light emissions	• Increased risk of stress on individuals and relocation of species	• Short term • Limited to 2025-2027	• Site and neighbouring sites	Medium • Temporary • Can interfere with basic life cycle	Unlikely • Management will reduce the likelihood of impacts	Refer to item 24 in Table 9

Activity	Impact	Duration and frequency	Area of impact	Severity of impact	Likelihood	Management measures
	• Altered behaviour (i.e., reduced ability to forage, breed, navigate and avoid predators)	• Limited light usage during night hours for security purposes		behaviours and impact movement	• Some level of light pollution is already present on and (adjacent to the Warrego Highway and residential landscapes)	
Production of waste	• Reduced quality of habitat • Potential lethal ingestion	• Frequent • Ongoing during construction phase • Ongoing from 2025 to 2027	• Consolidated the development footprint	Medium • Variable (depending on the material being released into the environment)	Possible • Reduced by proposed management measures	Refer to items 21 and 22 in Table 9
Post-construction						
Noise and vibration emissions	• Increased risk of stress on individuals and relocation of species • Altered behaviour (i.e., reduced ability to forage, breed, navigate and avoid predators)	• Long-term and frequent • Ongoing from 2027	• Site and neighbouring sites	Low-Medium • Low-medium decibel noise emissions consistent with low-impact industrial land use is required as per the Ipswich Planning Scheme	Unlikely • Management will reduce the likelihood of impacts and reduce impacts to the immediate vicinity of new buildings • Some level of noise is already present on the site (adjacent to the Warrego Highway)	Refer to item 24 in Table 9
Light emissions	• Increased risk of stress on individuals and relocation of species • Altered behaviour (i.e., reduced ability to	• Long-term and frequent • Ongoing from 2027	• Site and neighbouring sites	Moderate • Can interfere with basic life cycle behaviours and impact movement	Unlikely • Management will reduce the likelihood of impacts	Refer to item 28 in Table 9

Activity	Impact	Duration and frequency	Area of impact	Severity of impact	Likelihood	Management measures
	forage, breed, navigate and avoid predators)			• GHFF is less sensitive to light pollution than other flying foxes	• Some level of light pollution is already present on and adjacent to the site (Warrego Highway and residential landscapes)	
Increased human occupancy	• Increased risk of stress on individuals and relocation of species	• Long-term and frequent • Ongoing from 2027	• Area of human occupancy will be confined to areas of the development	Low • Human occupancy is common throughout the area and additional anthropogenic impacts are limited • GHFF known to occur in urban/disturbed areas	Unlikely • Site is adjacent to existing development and a major highway corridor	Refer to items 27-30 in Table 9

8 SIGNIFICANT IMPACT ASSESSMENT

The purpose of this section is to assess the significance of the direct and indirect impacts identified in the previous section. The Minister for the Environment has decided that the proposed action is likely to have a significant impact on listed threatened species and communities, namely the GHFF. The assessment of impacts on threatened species and communities has been assessed in accordance with relevant departmental policies and guidelines.

The Significant Impact Guidelines (Department of the Environment 2013b) identify that approval is required if an action has, will have, or is likely to have a significant impact on a species listed as *extinct in the wild, critically endangered, endangered* or *vulnerable* or on a listed migratory species. A significant impact is likely if there is a real chance or possibility of the impact occurring. (Department of the Environment 2013b). Assessment of threatened species impacts should consider both the species and habitats which are critical to the survival of the species.

The following section utilises the Significant Impact Guidelines (or species-specific guidelines where relevant) to determine if there will be a significant impact on the identified species. For *vulnerable* species, the Significant Impact Guidelines identify that an action is considered likely to have a significant impact on a listed species if there is a real chance or possibility that the action will:

- lead to a long-term decrease in the size of an important population of a species,
- reduce the area of occupancy of an important population,
- fragment an existing important population into two or more populations,
- adversely affects habitat critical to the survival of a species,
- disrupt the breeding cycle of an important population [4]
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,
- result in invasive species that are harmful to a *vulnerable* species becoming established in the *vulnerable* species' habitat,
- introduce a disease that may cause the species to decline, or
- interfere substantially with the recovery of the species.

Although the site does not contain nor is adjacent to a roost site, the site supports critical winter foraging food trees for the species and is within the foraging distance of several

[4] The Significant Impact Guidelines state that an 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range.

roosts, including one Nationally Significant Roost, as outlined in Section 6.2. The landscape surrounding Citiswich is dominated by disturbed areas and urban expansion. Approximately 30% of the total area in the foraging radius of the site is foraging habitat.

The proposed action will impact 17.4 ha of vegetation; however, 17.3 ha of foraging habitat is retained in open space. Although it is difficult to quantify the effects of habitat loss on a wide-ranging forager, it is possible that the loss of 17.4 ha of critical habitat in an area of high species density and rapid urban expansion may increase stress and pressure on the species due to pre-existing resource scarcity, and therefore contribute to resource bottlenecks during winter and spring. A breakdown of the habitat on the site for the GHFF and the impacts on the habitat are contained in Table 6. Refer to Figure 12 for a map of impacts to GHFF habitat.

TABLE 9: VOLUME OF GREY-HEADED FLYING-FOX HABITAT AND HABITAT IMPACTED.

Vegetation Survey Units	Habitat (ha)	Habitat impact (ha)	Habitat retained (ha)
2	13.2	12.7	0.5
3	13.4	2.2	11.2
4	8.1	2.5	5.6
TOTAL	**34.7**	**17.4**[5]	**17.3**

[5] Total habitat impacted by the action does not include vegetation in various easements that are intermittently cleared by relevant parties.

FIGURE 22: GREY-HEADED FLYING-FOX HABITAT (NATIVE VEGETATION) RETAINED AND REMOVED.

TABLE 10: SIGNIFICANT IMPACT GUIDELINES FOR THE VULNERABLE GREY-HEADED FLYING-FOX.

Significant Impact Criteria – Vulnerable Species	
Criteria	**Assessment**
Lead to a long-term decrease in the size of an important population of a species. Note: The population of a species is defined under the EPBC Act (Department of the Environment 2013b) as an occurrence of the species in a particular area. In relation to *critically endangered, endangered* or *vulnerable* threatened species, occurrences include but are not limited to: • a geographically distinct regional population, or collection of local populations, or • a population, or collection of local populations, that occurs within a particular bioregion. Note: An 'important population' is defined under the EPBC Act (Department of the Environment 2013b) as a population that is necessary for a species' long-term survival and recovery. This may include populations identified in recovery plans, and/or that are: • key source populations either for breeding or dispersal, • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range.	The development could lead to a long-term decrease in the size of an important population because: • The development is within 20 km (foraging radius) of a Nationally Significant Roost, • Although the GHFF is considered one fluid national population, the recovery plan identifies *Nationally Important Roosts* that are critical to species recovery, and have therefore been considered consistent with the intent of an *important population of the species,* • The development will impact 17.4 ha of critical foraging habitat for the species (high-value regrowth vegetation), • The site is within the foraging radius of sixteen (16) GHFF roosts that have been permanently or seasonally occupied in the past five (5) years, • Loss of 17.4 ha of critical habitat may increase stress and pressure on the species due to pre-existing resource scarcity and therefore contribute to resource bottlenecks during winter and spring. Despite the above, the following should be considered: • 17.3 ha of vegetation is retained in open space, • Dust, noise, and light pollution controls will be implemented throughout construction and during post-construction stages (see Section 9), • Landholders will not be permitted to utilise barbed wire (or similar) fencing material on their property (see Section 9), • The development site is surrounded by residential and industrial landscapes.
Reduce the area of occupancy of an important population. Note: Area of occupancy is defined as the area within the 'extent of occurrence', that is occupied by the species using 2 x 2 km grid cells (IUCN Standards and Petitions Committee 2022). 'Extent of occurrence' is the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy (IUCN Standards and Petitions Committee 2022).	• The development will not reduce the area of occupancy for resting, shelter, social communication or breeding; however, the development will reduce the area of critical winter foraging habitat for the species by 17.4 ha. The development will not reduce the total range of the species but will reduce the area of foraging habitat available.
Fragment an existing important population	The GHFF is considered one fluid national population due to high mobility and genetic exchange. They live in high-density roosts and camps and leave only to forage for food. Although the GHFF is considered one population, the recovery plan identifies *Nationally Important Roosts* that are critical to

Significant Impact Criteria – Vulnerable Species	
into two or more populations.	species recovery and have therefore been considered consistent with the intent of an *important population of the species* (as per the definition of an important population, see Notes). Regardless, they are exclusively aerial and arboreal, and therefore, terrestrial fragmentation does not severely influence the population, except by reducing foraging habitat and reducing food availability. Therefore, the development will not fragment an important population into two or more populations. The development does not impact on any roosts.
Adversely affects habitat critical to the survival of a species.	The vegetation on the site is foraging habitat critical to the survival of the species (see Section 6.2.2.4). The development will permanently remove 17.4 ha of critical foraging habitat on the site and therefore will adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population.	Although the GHFF is considered one population, the recovery plan identifies *Nationally Important Roosts* that are critical to species recovery and have therefore been considered consistent with the intent of an *important population of the species* (as per the definition of an important population, see Notes). Loss of critical foraging habitat might impact the breeding cycle of the population. Limited food resource availability in winter can cause resource bottlenecks that can induce stress and impact the breeding cycle of the GHFF. Resource scarcity will disrupt the consistent use of roosts due to the need to undergo wide dispersal for food. The GHFF has no physical adaptations to withstand food shortages or high temperatures and is susceptible to stress. Due to the presence of a high number of roosts within the vicinity of the site, the loss of critical foraging habitat has the potential to impact the breeding cycle of the population. The development might impact the breeding cycle of an important population, via impacts on foraging habitat.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The cumulative effect of loss of critical habitat has caused the decline of the species. It is difficult to identify the threshold at which a single instance of habitat loss might cause or contribute to species decline due to the highly mobile and wide-ranging habit of the GHFF. There are alternative foraging opportunities present in South D'Aguilar National Park to the north of the development site. However, the patches of habitat closer to the Ipswich locality are likely to provide key 'stepping stone' resources in fragmented locations to provide the species with foraging options and increased landscape continuity. As per section 6.2, the species has complex habitat requirements including multiple populations of food trees dispersed over a large area. This makes it difficult to protect foraging habitats solely within conservation reserves, such as national parks, and leaves the species vulnerable to land uses that may clear native vegetation or degrade habitat (Department of Agriculture Water and the Environment 2021). Although the loss of habitat is unlikely to cause

Significant Impact Criteria – Vulnerable Species	
	decline of the species overall, due to the high volume of roosts within 20 km of the site and the context of the habitat, in which 42% of the land area is developed land, it is possible that the habitat loss could contribute to loss of the species from the local area and contribute to the key threatening processes to the species identified in the recovery plan, namely, loss of critical habitat.
Result in invasive species that are harmful to a *vulnerable* species becoming established in the *vulnerable* species' habitat.	The GHFF only utilises the site habitat for foraging purposes. There is no listed invasive species that is a threat to the GHFF. Invasive vegetation that might out-compete canopy trees will not out-compete the established retained vegetation. Biosecurity controls will be implemented for the management of invasive flora (see Section 9).
Introduce diseases that may cause the species to decline.	Disease occurs in GHFF populations, however, in most cases, viruses appear to have evolved with the flying-foxes and are generally in equilibrium with the population. However, when flying-foxes are subject to significant ecological stress the incidence of disease, such as Lyssavirus, can increase to the point where the disease can impact the population, as well as occurring in higher rates in sick, injured and orphaned flying-foxes (Department of Agriculture Water and the Environment 2021). The lyssavirus is not a listed threat to the species, and it is very unlikely that the industrial development of Stage 7 will introduce new diseases that will cause the species to decline. However, loss of critical habitat may increase stress and pressure on the species due to pre-existing resource scarcity and therefore contribute to stressors that could increase the prevalence and impacts of Lyssavirus in the population. However, we consider it very unlikely that the removal of 17.4ha of habitat will induce stress to the magnitude that increases lyssavirus prevalence to the point of causing species decline.
Interfere substantially with the recovery of the species.	The actions listed under the National Recovery Plan for the Grey-headed Flying-fox (Department of Agriculture Water and the Environment 2021) aim to: • Improve the national population trend; • Identify, protect and increase key foraging and roosting habitat; • Improve the community's capacity to coexist with flying-foxes; and, • Increase awareness about flying-foxes, the threats they face and the important ecosystem services they provide as seed dispersers and pollinators. The development results in the removal of habitat that may result in decline of the species: • The development is within 20 km (foraging radius) of a Nationally Significant Roost, • Although the GHFF is considered one fluid national population, the recovery plan identifies *Nationally Important Roosts* that are critical to species recovery, and have therefore been considered consistent with

Significant Impact Criteria – Vulnerable Species	
	the intent of an *important population of the species* (as per the definition of an important population, see Notes), • The development will impact 17.4 ha of critical foraging habitat for the species (high-value regrowth vegetation), • The site is within the foraging radius of sixteen (16) GHFF roosts that have been permanently or seasonally occupied in the past five (5) years, • Loss of 17.4 ha of critical habitat may increase stress and pressure on the species due to pre-existing resource scarcity, and therefore contribute to resource bottlenecks during winter and spring. Despite the above, the following should be considered: • 17.3 ha of vegetation is retained in open space, • Dust, noise, and light pollution controls will be implemented throughout construction and during post-construction stages (see Section 9), • Landholders will not be permitted to utilise barbed wire or other fauna unfriendly material on their property (see Section 9), • Remnant critical habitat is present within 20 km (foraging radius) of the development site, some of which is protected in reserves, most of which is freehold land, and • The development site is surrounded by residential and industrial landscapes.

In summary, the impact of the development on the species will result in the removal of critical foraging habitat totalling 17.4 hectares in a location that is within the average foraging range of 16 roosts utilised by the species, as well as one Nationally Significant Roost. This could contribute to the decline of the species due to the density of the species in the area and the pre-existing resource scarcity. Urban development is rapidly expanding in the locality and resource scarcity is the primary driver of species decline. (Ecosure Pty Ltd 2021). As such, it is possible that the clearing could contribute to resource bottlenecks, and breeding cycle disruption, and may interfere with the species' recovery. Taking into account all the above, the impact on the species is considered to be significant.

9 MANAGEMENT MEASURES

This section of the report describes environmental management measures that are intended to avoid, mitigate and manage environmental impacts of the proposed development.

The measures described in this section include conditions imposed by the local government and the State Government. These conditions are mandatory and must be complied with in order to develop the land. Supplementary management measures are also proposed by the proponent to further mitigate or minimise potential development impacts.

This report contains a summary of critical management measures relating to the GHFF. For a detailed report of all management measures relevant to the proposed action, refer to the Construction and Environmental Management Plan (CEMP, Appendix 10). The Site Environmental Manager (SEM) is responsible for the enforcement of the provisions of the CEMP and the management measures to avoid, minimise and mitigate impacts on the GHFF contained in this report.

The establishment of management measures has been based on an understanding of threats to the GHFF and species requirements set out in Section 6.2 as per the National Recovery Plan for the species (Department of Agriculture Water and the Environment 2021).

The following subsections describe the mandatory and proposed measures, including:

- Management measures described in permit conditions; and,
- Supplementary impact avoidance, mitigation and management measures.

9.1 PERMIT CONDITIONS

A number of conditions have been included in the Council and State approvals. The relevant conditions are summarised in the Construction Environmental Management Plan (CEMP) (Litoria Consulting, October 2023). All conditions are mandatory. As such, the applicant must carry out the development strictly in accordance with the specified conditions.

The measures outlined in the conditions are expected to be effective through:

- The preparation of management plans that identify the site-specific measures required to achieve compliance with the permit conditions, relevant Australian Standards and current best practice guidelines,
- The implementation of design measures and construction methodologies, which aim to avoid and reduce impacts on environmental values, and

- Outlining operational requirements that must be in place for the life of the development.

9.2 SUPPLEMENTARY MEASURES

In addition to the permit conditions outlined above, this section outlines management practices and mitigation strategies that aim to reduce the impacts of the proposed development on MNES.

Management measures have been determined using the impact management hierarchy: avoid, mitigate, minimise. In terms of avoiding impacts, the proposed development avoids impacts on environmental values by conserving 17.3 ha of observed native vegetation within the open space. The area to be conserved includes areas of:

- Regrowth 12.3.3. *endangered* regional ecosystem (RE) *Eucalyptus tereticornis* woodland on Quaternary alluvium;
- Regrowth 12.9-10.2 *least concern* RE *Eucalyptus tereticornis* woodland on Quaternary alluvium; and
- Regrowth 12.3.7 *least concern* RE *Eucalyptus tereticornis, Casuarina cunninghamiana* subsp. *cunninghamiana* +/- *Melaleuca* spp. fringing woodland.

The open space area is to be dedicated to the City of Ipswich as parkland, as per condition 23 of the Preliminary Approval for Material Change of Use component of permit 3356/2002/CA (Appendix 5 – Relevant Approval), and as such, will be protected from any future direct impacts.

The management measures will be implemented by the developer and/or their contractors. The measures are expected to be effective through the use of best practice management strategies to further minimise impacts on threatened fauna and habitat. The effectiveness of management measures has been rated based on the ability of the measure to reduce the intensity or risk of an impact (Refer to Table 8, and Table 9).

Where relevant, the management measures are consistent with threats and management strategies outlined in the Department guidance provided for the GHFF. Management measures are discussed further in the CEMP (Litoria Consulting, October 2023).

TABLE 11: MANAGEMENT MEASURE EFFECTIVENESS RATING.

Descriptor	Description
High	The management measure greatly reduces the magnitude of the impact, such that there is minimal environmental harm.
Moderate	The management measure somewhat reduces the magnitude of the impact.
Low	The management measure provides a minimal reduction in the magnitude of the impact.

TABLE 12: AVOIDANCE, MITIGATION AND MANAGEMENT MEASURES FOR RELEVANT MNES.

Item	Management Measure	Frequency / Duration	Impact Outcome	Effectiveness
Pre-construction				
1	Approximately 17.3 ha of native vegetation is conserved in areas that are connected to adjacent bushland. Vegetation is not adjacent to industrial lots and is separated by existing open space areas and perimeter/access roads.	At all times.	Edge effects and destruction of habitat are minimised.	Moderate
2	Vegetation clearing extents are clearly identified on site prior to the commencement of works.	Prior to, and during pre-construction.	Avoids accidental clearing or damage of vegetation in areas outside of the clearing boundaries.	High
			Additional/unapproved impacts on threatened fauna are avoided.	High
3	Existing fencing on site that is not fauna-friendly will be removed. All new fencing will use small gauge mesh and must not use barbed wire, netting or spikes.	At all times.	Avoids injury or mortality to aerial fauna, particularly GHFF.	High
4	Vegetation protection fencing is established at the interface between all works areas and vegetation is to be retained/conserved during clearing works. Signage on fences will be installed to ensure no entry into areas of retained vegetation (except for necessary environmental management and monitoring).	Prior to vegetation clearing and during pre-construction and construction.	Avoids damage or clearing of vegetation outside of approved clearing areas.	High
5	Where the site boundary adjoins native vegetation on neighbouring lots, vegetation protection fencing will be fauna-friendly to allow the dispersal of ground-dwelling fauna.	Prior to vegetation clearing and during pre-construction.	Allows fauna to be ushered from the site during vegetation clearing and avoids direct mortality or injury to fauna.	High

Item	Management Measure	Frequency / Duration	Impact Outcome	Effectiveness
			Mitigates stress on fauna	Moderate
6	Wildlife Spotter Catchers are to inspect all areas to be cleared prior to the commencement of works, with consideration of nocturnal species. This process includes: • Inspecting all accessible fauna habitat features (hollow-bearing trees, nests, decorticating bark, arboreal termitaria etc.) for the presence of fauna or evidence of potential fauna use (e.g. active nests, fresh faeces); • Relocating / ushering of any non-itinerant fauna (other than the Koala and GHFF), where practicable, to nearby patches of vegetation or nearby bushland in accordance with, *inter alia,* the *Code of Practice – Care of Sick, Injured or Orphaned Protected Animals in Queensland* (Department of Environment and Heritage Protection 2013a), and the *Technical Manual: Interim hygiene protocol for handling amphibians* (Department of Environment and Heritage Protection 2013b); • Prominently marking (i.e., applying green flagging tape) any vegetation identified as potentially harbouring fauna or fauna habitat features (e.g., hollows, nests, decorticating bark). This is to provide a visual guide for the Wildlife Spotter Catcher and construction personnel during vegetation clearing; and, • Clearing of vegetation will not commence until all threatened fauna vacate the site or are removed by a suitably qualified person.	Prior to vegetation clearing.	Avoids injury or mortality to fauna by ushering, removing or identifying where fauna is present prior to vegetation clearing.	High
			Mitigates stress on fauna.	Moderate
7	Vegetation removal is to be undertaken by suitably qualified contractors. Site personnel will be provided with sufficient environmental education on pest control and threatened species ecology.	At all times.	Avoids the risk of environmental impacts due to negligence.	High
8	Wildlife Spotter Catchers are to supervise and be present on each day that vegetation clearing takes place.	During vegetation clearing.	Avoids injury or mortality to fauna as the Wildlife Spotter Catchers can halt clearing, relocate or usher fauna from the site.	High

Item	Management Measure	Frequency / Duration	Impact Outcome	Effectiveness
9	Where identified, active hollows, nests or other breeding places are not to be interfered with. Note: Tampering with an animal breeding place is in violation of the *Nature Conservation Act 1999* under section 332 of the *Nature Conservation (Wildlife Management) Regulation 2006*. However, this does not apply to a person removing or otherwise tampering with the breeding place if the removal or tampering is part of an approved species management program for animals of the same species, or, if the person holds a damage mitigation permit for the animal and the permit authorises the removal or tampering.	At all times.	Avoids injury or mortality to fauna	High
10	Best practice noise management will be adopted during the pre-construction phase of the development, including limited hours of work, the use of quieter equipment and allowing respite days/hours.	At all times.	Minimises impacts such as altered behaviour, stress and displacement of fauna.	Moderate
11	Vegetation clearing should be staged or take place sequentially, allowing fauna to move to adjoining habitats, noting that at the time of submission, approved conditions have not been attained from Ipswich City Council. Vegetation clearing should start at the western boundary and move east towards adjacent bushland. Vegetation clearing will have intermittent 'wait' periods to allow respite and for Wildlife Spotter Catchers to inspect the area.	During clearing.	Injury or mortality of fauna is mitigated by allowing sufficient time and space for fauna to vacate the site.	Moderate
			Mitigates stress on fauna.	Low
12	All cleared native vegetation is mulched on-site and recycled for use in landscape treatments.	At all times.	Avoids additional impacts on fauna by removing potential refuge in a timely manner.	Moderate
13	Mulch stockpiles are to be located in existing cleared areas, outside of TPZs and at least 40 m from waterway/wetland areas.	At all times.	Impacts on fauna movement are mitigated.	High
14	Mulch stockpiles are subject to erosion/sediment control measures in accordance with best practice design standards (i.e., stockpiles are covered)	At all times.	Indirect impacts on fauna, such as dust, are mitigated.	Moderate

Item	Management Measure	Frequency / Duration	Impact Outcome	Effectiveness
15	Any tree pruning or maintenance work is carried out by a qualified arborist in accordance with *AS 4373 2007 Pruning of amenity trees*.	At all times.	Avoids the risk of environmental impacts due to negligence.	High
16	Best practice weed management protocols are developed to prevent the introduction and/or spread of pest species e.g., exotic vegetation mulch, in particular mulch containing declared pest plant material, is to be disposed of as green waste at landfill or recycled via composting.	At all times.	Avoids and mitigates the impacts of weeds on fauna.	High
17	Best practice fauna management protocols are developed to prevent the introduction and spread of pest species. Declared pest mammals are contained and eradicated from the site according to current best practice management techniques.	At all times.	Avoids and minimises the impacts of feral predators on native species.	High
Construction				
18	All fauna-friendly fencing will be converted to fauna exclusion fencing at the perimeter of adjacent vegetation and following vegetation clearing and following a survey by Wildlife Spotter Catchers to ensure threatened fauna have vacated the site. Escape devices (i.e., escape poles, gaps, ropes, bridges) will be established on the development side of the fencing.	Following vegetation clearing and prior to construction.	Avoids injury or mortality to fauna	High
19	Signage on fences will be installed to ensure no entry into areas of retained vegetation (except for necessary environmental management and monitoring).	Prior to construction.	Avoids the risk of environmental impacts due to negligence.	High
20	Construction will be undertaken by suitably qualified persons. Site personnel will be provided sufficient environmental training on pest control and threatened species ecology.	At all times.	Avoids the risk of environmental impacts due to negligence.	High
21	Best practice fauna and weed management protocols are developed to prevent the introduction and spread of pest species.	At all times.	Avoids and minimises injury or mortality to fauna	High

Item	Management Measure	Frequency / Duration	Impact Outcome	Effectiveness
	• Mulch containing declared pest plant material, is to be disposed of as green waste at landfill or recycled via composting. • Declared pest species are contained and eradicated from the site according to current best practice management techniques (i.e., localised trapping and spraying weeds) • Waste or tip sites will be effectively managed and removed appropriately.		Avoids and minimises the risk of competition and vegetation thickening through the spread of pest species.	High
22	Construction activities and exposed dirt tracks will be subject to erosion/sediment control measures in accordance with best practice design standards (i.e., covering stockpiles, dampening the ground, avoiding dust-generating work on very windy days).	At all times.	Indirect impacts on fauna, such as dust and soil degradation, are mitigated.	High
23	Trenches and other excavated areas will be filled within a reasonable period of time, are covered when unsupervised and provide exit points for fauna (i.e., ramps, ropes, hessian sacks).	At all times.	Avoids and mitigates injury, mortality or stress to entrapped fauna.	High
24	Light fixtures will be located, directed and shielded to avoid lighting anything but the target object or areas (i.e., construction zones). Only the minimum number and intensity of lights needed to provide safe and secure illumination for the site will be installed. Amber LED lighting will be used where possible.	At all times.	Avoids stress, altered behaviour and displacement of fauna.	High
25	Best practice noise management will be adopted during the construction phase of the development, including limited hours of work, the use of quieter equipment and allowing respite days/hours.	At all times.	Minimises impacts such as altered behaviour, stress and displacement of fauna.	Moderate
26	Traffic control measures will include: • Signage to prevent unauthorised off-track driving. • Reduced and enforced speed limits for all vehicles. • Operation of vehicles will be limited during dusk, dawn and night hours. • Recording and reporting road kill.	At all times.	Avoids and mitigates injury or mortality to fauna.	High
Post-construction				

Item	Management Measure	Frequency / Duration	Impact Outcome	Effectiveness
27	Best practice fauna and weed management protocols are developed to prevent the introduction and spread of pest species. • Declared pest species are contained and eradicated from the site according to current best practice management techniques (i.e., localised trapping and spraying weeds) • Waste or tip sites will be effectively managed and removed appropriately.	As required.	Avoids and minimises injury or mortality to fauna (i.e., lethal ingestion or predation).	Moderate
			Avoids and minimises the risk of competition and vegetation thickening through the spread of pest species.	Moderate
28	Light fixtures will be located, directed and shielded to avoid lighting anything but the target object or areas (i.e., pedestrian footpaths). Only the minimum number and intensity of lights needed to provide safe and secure illumination for the site will be installed. Amber LED lighting will be used where possible.	At all times.	Avoids stress, altered behaviour and displacement of fauna	High
29	Traffic control measures will include: • Signage to prevent public access into unauthorised areas. • Reduced and enforced speed limits for all vehicles.	At all times.	Avoids and mitigates injury or mortality to fauna.	High
30	The development design is to ensure strategic use of fauna-friendly and fauna-exclusion fencing such that fauna can access adjacent vegetation and vegetation in the open space in the operational phase without being trapped inside the industrial footprint.	At all times.	Mitigates the effect of vegetation clearing and barriers to movement. Regardless, the site is very difficult for terrestrial fauna access due to the Warrego Highway and Bremer River.	Moderate

9.3 ENVIRONMENTAL MONITORING AND EVALUATION

Compliance with management measures will be achieved through self-administered weekly monitoring and subsequent reporting to the relevant authority (if required).

Environmental auditing, monitoring and compliance will be overseen by the Site Environmental Manager; however, all personnel entering the site must familiarise themselves with the requirements of the CEMP (Appendix 10) and acknowledge their responsibility to comply with the Plan's requirements.

As the project progresses, environmental impacts may change. As such, it is important that management measures are revised to address any environmental impacts arising from the changes in activities.

The effectiveness of management measures will be reviewed by the SEM as required if any additional activities are to be carried out. Each review period will investigate:

- Potential gaps between the management measures and on-site construction activities;
- Assessment of any incidents or near misses that occurred since the previous review; and,
- Employee and workplace compliance.

The review should include consultation between employees and management to review and discuss concerns.

Ongoing monitoring and review of compliance with management measures ensures that risks are constantly identified, assessed and managed, ensuring their efficiency and effectiveness.

For detailed information on monitoring and evaluation, including the GHFF Management Sub-Plan, refer to the CEMP (Appendix 10).

10 RESIDUAL SIGNIFICANT IMPACT

A residual significant impact on the GHFF as a result of the proposed development has been identified despite the proposed impact avoidance, minimisation and mitigation strategies. The development can control construction and operational impacts for light, noise, dust, and edge effects; however, the unavoidable outcome of the development involves the loss of 17.4 ha of habitat critical to the survival of the species.

Contributing to the significance of the impact is the context of the development. Within a 20 km radius of the site (foraging radius for the species), there are 16 roosts for the GHFF which have been utilised seasonally or permanently by the GHFF over the past five (5) years (2017-2021). In addition, the site is located within 10 km of a Nationally Significant Roost, which is known to regularly support several thousand individuals.

As the impacts cannot be avoided, minimised, or mitigated, a compensatory environmental offset is proposed in accordance with the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy (EPBC Environmental Offsets Policy). Details of the proposed offset have been provided in Section 14.

11 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The following sections assess the proposed action against the principles of Ecologically Sustainable Development (ESD), as defined in section 3A of the EPBC Act. The principles of ESD and the project implementation of these principles are identified in Table 10.

TABLE 13: ASSESSMENT OF THE PROPOSED ACTION AGAINST PRINCIPLES OF ESD.

Principle	Proposed Action
Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.	The proponent will maintain an environmental management system that complies with the Australian Standard ISO14001:2015. All decision-making processes and management will: • Identify impacts associated with the proposed action and avoid, minimise and mitigate potential impacts on the environment; • Comply with all legal requirements and approvals/licenses (i.e., permit conditions, management plans, procedures); • Ensure resources (i.e., human and financial resources, specialised skills, technology) are available to maintain and improve the environmental management system; • Ensure site personnel are provided with appropriate education and training; • Implement a procedure(s) for internal and external communication regarding significant environmental aspects and effectively control documentation of the environmental management system; • Maintain operational control and establish a procedure(s) to identify and manage potential accidents in relation to environmental aspects; and, • Conduct compliance investigations and report and record non-compliance or environmental incidents and provide corrective actions. The proposed action will provide long-term social and economic benefits to the Ipswich region by providing local employment and material goods.
If there are threats of serious or irreversible environmental damage, a lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.	Precautionary measures, including risk assessment and management, are considered for the pre-construction, construction and post-construction phases of the proposed action. Potential impacts are identified and assessed in Section 7. Management strategies to avoid, minimise and mitigate potential impacts are addressed in Section 9 of the PD Report and in the Construction Environmental Management Plan (Litoria Consulting, October 2023). Measures will be guided by best practice management and will be consistent with Department advice provided for the GHFF.
The principle of inter-generational equity—is that the present generation should ensure that the	The proposed development avoids impacts on environmental values by providing an offset for unavoidable impacts on critical habitat for the GHFF. In addition, vegetation is retained in the open space areas on the site. Management measures will ensure that impacts on

health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.	retained vegetation are avoided to maintain the health, diversity, and productivity of open space areas. The open space area is to be dedicated to the City of Ipswich as a linear park, and as such, will be maintained by the council and is likely to be protected from any future direct impacts.
The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.	The proposed development compensates for the impact on environmental values by providing an offset for unavoidable impacts on critical habitat for GHFF. In addition, vegetation is retained in the open space areas on the site. Management measures will ensure that impacts on retained vegetation are avoided to maintain the health, diversity, and productivity of open space areas. The open space area is to be dedicated to the City of Ipswich as a linear park, and as such, will be maintained by the council and is likely to be protected from any future direct impacts.
Improved valuation, pricing and incentive mechanisms should be promoted.	The costs associated with environmental commitments and management measures will be incorporated into the planning and operational costs of each phase of the proposed action.

12 OTHER MATTERS

The Department has requested an assessment of non-MNES matters to provide additional context and justification of the proposed action, including economic and social impacts of the action, and a description of any engagement undertaken with indigenous or other public stakeholders. The following sections summarise:

- Economic and social matters, and
- Stakeholder engagement.

12.1 ECONOMIC & SOCIAL MATTERS

Walker Corporation's Citiswich is Queensland's largest industrial development, providing connected industrial land for a broad range of businesses. A report analysing the economic history and potential for Citiswich states that five billion dollars worth of transport and service upgrades to the region have increased traffic, accessibility and therefore demand in Citiswich. The proposed action is a response to a driving demand for industrial opportunities in regions neighbouring Brisbane City Council. Refer to the Citiswich Business Park Benefit Cost Assessment and Economic Impact Analysis by Macroplan Holdings (Citiswich economic analysis) (Appendix 11). This report, along with additional information from Walker Bremer Park Pty Ltd, has been summarised in the following sections.

12.1.1 ECONOMIC AND SOCIAL IMPACTS

The Citiswich Stage 7 development will further promote Ipswich's economic base, assist in employment growth and help to reduce unemployment. This in turn will grow a more diverse economy and grow employment in other sectors within a range of industries. The development will also result in social improvements in training and education outcomes and knowledge acquisition will benefit employees as they develop their trade, skills and careers. In addition, the development is likely to increase interest and knowledge in the Ipswich region. The development improves the local business profile and creates business opportunities with tenants occupying the Business Park Stage 7. Refer to the Citiswich Economic Analysis (Appendix 11) for more information regarding the projected economic and social impacts of the construction expenditure.

12.1.2 PROJECTED COSTS / BENEFITS

The proposed development, by way of a construction expenditure of $59.8 million, will create and/or increase direct wages and salary, purchases of goods and services, and direct value-adds that far exceed the construction expenditure. Refer to the Citiswich

Economic Analysis (Appendix 11) for more information regarding the projected cost benefits for the construction expenditure.

12.1.3 EMPLOYMENT OPPORTUNITIES

The proposed development will accommodate a range of clients including firms associated with a range of industry and business uses including but not limited to logistics, technology, transport, manufacturing, distribution and construction. Over an assumed three-year construction phase period, the project will create local employment opportunities for local construction workers and builders, concreters, electricians, plumbers and many other skilled trades and labouring positions. Total employment generated by the action includes the creation of 2,656 new full-time jobs or equivalent positions sustained in Stage 7 on an ongoing basis. Refer to the Citiswich Economic Analysis (Appendix 11) for more information regarding the projected employment opportunities for the construction expenditure.

12.2 STAKEHOLDER ENGAGEMENT

12.2.1 PUBLIC CONSULTATION

No public consultation has been undertaken as part of the proposed action, aside from compulsory public commentary periods undertaken as part of the referral process EPBC 2021/9112, for which the Department has access to relevant submissions.

12.2.2 INDIGENOUS ENGAGEMENT

Walker Bremer Park Pty Ltd understands and recognises it has a duty of care to Indigenous engagement.

The proponent will carry out the proposed action in accordance with the Queensland Government's Aboriginal Cultural Heritage Act 2003 Duty of Care Guidelines (Department of Aboriginal and Torres Strait Islander Partnerships 2004), which will ensure the effective recognition, protection and conservation of Aboriginal cultural heritage.

Having considered the *Aboriginal Cultural Heritage Act 2003* Duty of Care Guidelines (Department of Aboriginal and Torres Strait Islander Partnerships 2004), investigations into the cultural heritage of the land can be summarised as follows:

- Part of the land is registered with the Queensland Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships Aboriginal Cultural Heritage Register and Database, as having a (historical) artefact scatter, identified as KB: G51 (Latitude -27.588543 and Longitude 152.826722). This notation is located within a Powerlink easement over Lot 2 on RP104683. The proposed action is not located on or near KB: G51 and the area will not be otherwise disturbed.

- The land is considered Category 4, being land subject to Surface Disturbance and Significant Ground Disturbance in the past. The history of Significant Ground Disturbance on the Land and surrounds, includes, *inter alia*, a flour mill, steam sawmill, boiling down works, associated infrastructure, accommodation and quarters, and mining. More recently, the disturbance has included Powerlink powerlines and power poles. The proponent acknowledges that these areas may have residual cultural heritage significance.

Having regard to the aforementioned matters, the proponent sought advice on 4 August 2022 from the Yuggera Ugarapul People (YUP) – the traditional owners of regions and places in Ipswich and custodians of the land with connection to the country. The result of the consultation is summarised below:

- It is recommended that two (2) representatives are to be present, one each for the Yuggera and Ugarapul People, to monitor any works being undertaken near the registered site (KB: G51) on Lot 2 on RP104683.
- The proponent will take all reasonable and practicable measures to ensure the proposed action does not harm Aboriginal cultural heritage.
- Any unexpected Aboriginal cultural heritage feature that arises in the course of undertaking the proposed action, the proponent will immediately cease the activity and comply with the *Aboriginal Cultural Heritage Act 2003* Duty of Care Guidelines (Department of Aboriginal and Torres Strait Islander Partnerships 2004) with respect to preserving the feature in consultation with YUP.
- In the extent of any uncertainty, the proponent will notify YUP and seek advice as to whether a particular feature might constitute Aboriginal cultural heritage and if it is determined to be the case, consult with YUP as to the best way to manage and protect the feature in the best interests of YUP.
- The proponent and project team will actively monitor all works and to the extent required, will have a cultural heritage expert in attendance to oversee and manage the process. Otherwise, the proponent confirms that it will ensure the activities will be undertaken with extra care and at all times will proceed in compliance with the *Aboriginal Cultural Heritage Act 2003* Duty of Care Guidelines (Department of Aboriginal and Torres Strait Islander Partnerships 2004) and with the intention of avoiding any harm to Aboriginal cultural heritage.
- The proponent will respect the views of YUP and any assistance that may be required in the future as a result of the proposed action in helping assess the Aboriginal cultural heritage significance of any identified features.

13 PERSON UNDERTAKING THE ACTION

Walker Bremer Park Pty Ltd understands and recognises it has a duty of care to the environment. The company's environmental management record does not include any instances of contraventions or non-compliance with development approval conditions. Site-specific management plans to mitigate the potential adverse impacts on environmental matters will be developed for the project as required under existing approvals.

The Designated Proponent and the person proposing to undertake the action, Walker Bremer Park Pty Ltd is a subsidiary of the parent company Walker Corporation Pty Ltd. The history of the parent body and other entities within Walker Group has been summarised below:

- Walker Group Holdings Pty Ltd has not been subject to proceedings under a Commonwealth, State or Territory Law.
- Walker Corporation Pty Ltd has been subject to two proceedings under State law:
  - *Director–General, Department of Environment and Climate Change (NSW), Walker Corporation Pty Ltd:* Walker was found guilty of clearing native vegetation without development consent on land at Picton Road, Wilton NSW on 14 May 2010.
  - *Director – General, Department of Environment and Climate Change (NSW), Walker Corporation Pty Ltd:* Walker was found guilty of clearing native vegetation without development consent on land at Macquariedale Road, Appin NSW on 30 November 2011.
- A subsidiary of Walker Group Holdings, Kew Development Corporation Pty Ltd has been subject to proceedings under State law:
  - *In 2007 Kew Development Corporation (a Walker subsidiary) pleaded guilty to excavating within a Tree Preservation Zone at its Kew Cottages site in Melbourne resulting in damage to the root of a tree. Kew Development Corporation was required to fund heritage tree protection measures in Kew Cottage's future stages. The tree was retained and is in good health today.*

The names and environmental records of executive officers (being directors current as of 24/06/2024) for the designated proponent and the parent company are summarised in Table 14.

TABLE 14: SUMMARY OF THE EXECUTIVE OFFICERS (DIRECTORS CURRENT AS OF 24/06/2024) FOR THE DESIGNATED PROPONENT AND THE PARENT COMPANY.

Item	Details	Executive officers (being Directors and Company Secretary current as of 24/06/2024)	ASIC Company Search Extract (current as of 24/06/2024)
Designated Proponent	Walker Bremer Park Pty Limited ACN 108 240 071	[redacted] *None of above listed current executive officers have personally had any history in relation to environmental matters.*	Appendix 12
The person proposing to undertake the action	Walker Bremer Park Pty Limited ACN 108 240 071	As above	As above
The parent company of the Designated Proponent and the person proposing to undertake the action	Walker Corporation Pty Limited ACN 001 176 263	[redacted] *None of above listed current executive officers have personally had any history in relation to environmental matters.*	Appendix 12

14 OFFSET DELIVERY PLAN

This PD Report determined that the proposed action would have a residual significant impact on habitat critical to the survival of the Grey-headed Flying-fox (GHFF). As such, an environmental offset is required to mitigate the impacts of the development on habitat critical to the survival of the species in accordance with:

- The Significant Impact Guidelines v1.1 (Department of the Environment 2013a), and
- The EPBC Act Environmental Offsets Policy (Department of Sustainability Environment Water Population and Communities 2012).

The aim of this section is to identify and determine the suitability of a potential offset site in accordance with policy requirements, including necessary information requested by the as part of the *Additional information required for preliminary documentation* (Sections 6 and 7 of the request). Note that the following information is also contained in the Offset Management Plan (Appendix 1) and has been included in this report for completeness.

The following section contains more information on:

- Offset objective;
- Offset site description;
- Offset assessment;
- Proposed offset;
- Conservation outcomes; and
- Legal security.

14.1 OFFSET OBJECTIVE

The objective of the offset is to compensate for residual significant impacts that remain on MNES impacted by the development (specifically GHFF) identified in the PD Report after the exhaustion of all reasonable avoidance and mitigation measures. The compensatory environmental offset is designed under the *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy (EPBC Environmental Offsets Policy). Offsets should align with conservation priorities for the impacted protected matter and be tailored specifically to the attributes of the protected matter to deliver a conservation gain.

The offset is to compensate for the proposed action by direct offset. Direct offsets are those actions that provide a measurable conservation gain for an impacted protected matter. Conservation gain is the benefit that a direct offset delivers to the protected matter, which maintains or increases its viability or reduces any threats of damage, destruction or extinction. A conservation gain may be achieved by (Department of Environment and Science 2018):

- Improving existing habitat for the protected matter;
- Creating new habitats for the protected matter;
- Reducing threats to the protected matter;
- Increasing the values of a heritage place; and/or,
- Averting the loss of a protected matter or its habitat that is under threat.

At the impact site, residual significant impacts have been identified as removing 17.4 ha of habitat critical to the survival of the species. Refer to the PD Report for a detailed assessment of residual significant impacts to the species. As such, the objective of the offset is to create, rehabilitate and protect habitat that exceeds the quality and quantity of habitat impacted at the impact site.

14.2 OFFSET SITE DESCRIPTION

The proposed offset is located on land described as [redacted] (the offset site). The offset site is located in the [redacted]ocality in the City of Ipswich local government area and has a total area of [redacted]. Figure 23 shows a recent aerial photograph of the offset site.

The offset site contains a mix of bushland and cleared areas. Until recently, the offset site was used for grazing purposes and timber was harvested as part of a native forest logging operation. In terms of existing infrastructure, the land is undeveloped other than boundary fencing a [redacted] that reduces the tenable land area[redacted]. The non-tenable area is indicated in Figure 23.

This section of the report describes the characteristics of the offset site including:

- Site context;
- Description of the existing environment;
- Assessment of habitat for GHFF; and
- Summary.

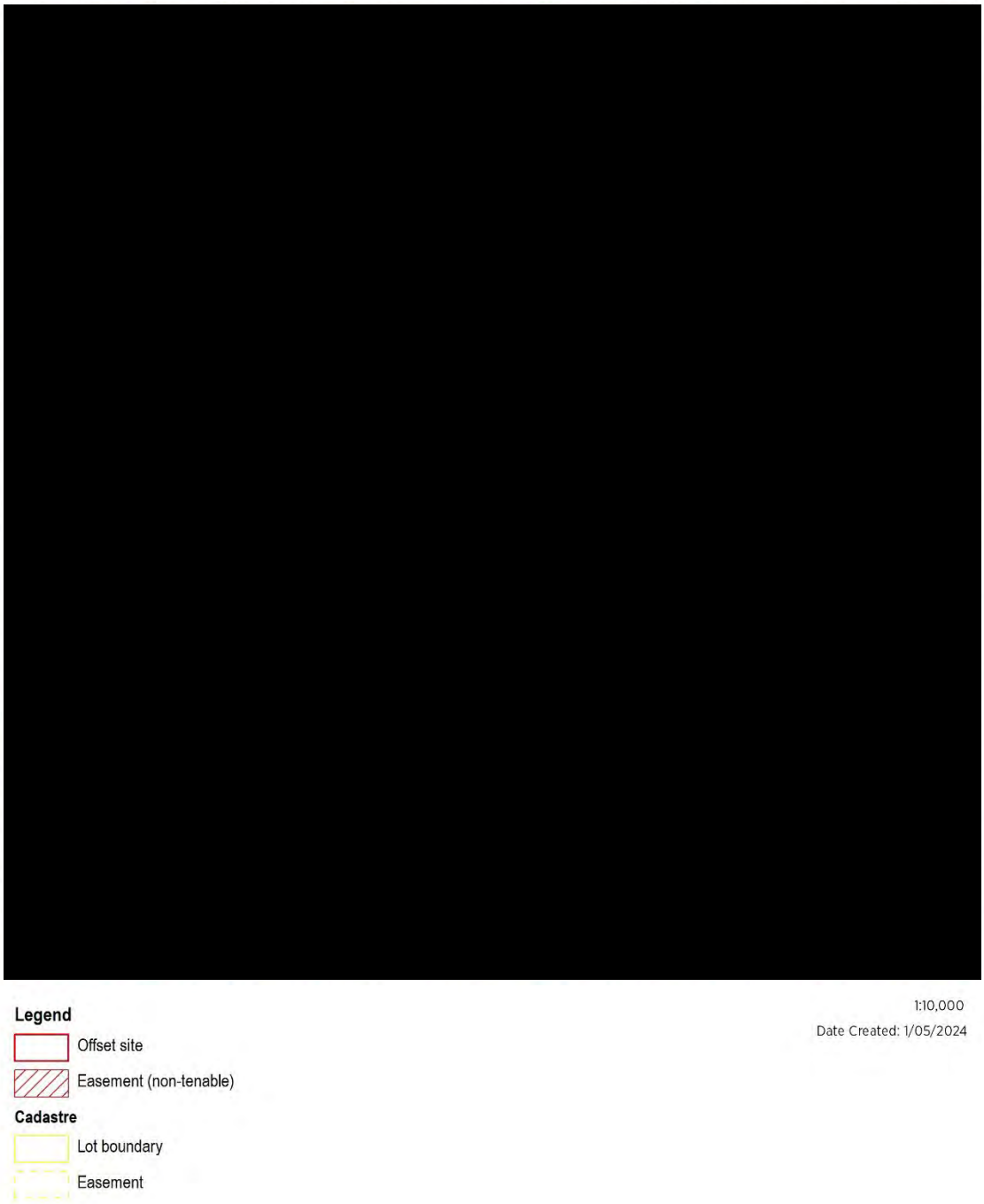


FIGURE 23: RECTIFIED DIGITAL AERIAL PHOTOGRAPH OF THE OFFSET SITE (IMAGE CAPTURED 01/04/2023, NEARMAP 2023).

14.2.1 SITE CONTEXT

The offset site is located in the South East Queensland bioregion in [redacted], roughly [redacted]. The offset site is located nearby to conservation reserves, [redacted] The site is also located within mapped Queensland statewide corridor buffers[6] (Figure 24). The offset site is located in the City of Ipswich local government area and is zoned conservation under the City of Ipswich planning scheme. [redacted]

The site is located within the foraging radius of roosts known to be utilised by the GHFF. The locations of flying fox roosts throughout Queensland are available via the interactive mapping system provided by the CSIRO, the National Flying Fox Monitoring Viewer (Australian Government 2022). [redacted] The known roosts exist predominantly in urban areas near riparian corridors and tributaries.

The offset site is located approximately [redacted] of the impact site. [redacted] The closest Nationally Significant Roost[7] can be found at Mt Ommaney [redacted]. This roost is the same Nationally Significant Roost within 10km of the impact site. [redacted]

The assessment of site context suggests:

- The offset site is appropriately zoned (conservation) and because of this, it is not at risk from urban development itself. This means that the land is likely to be suitable as an environmental offset in the long term.

[6] Statewide corridor buffer dataset depicts mapped terrestrial and riparian corridors across Queensland. Terrestrial corridors were derived from published Biodiversity Planning Assessments (BPA) and where BPAs are absent, corridors were derived from the Statewide Conservation Corridors, contained in Building Nature's Resilience: A Draft Biodiversity Strategy for Queensland (DERM, 2010). Similarly, riparian corridors are also derived from published BPAs of Queensland where available and where absent, major watercourses as depicted in the statewide GEODATA TOPO 250K Series 2 Topographic Data are used.

[7] Nationally important camps or Nationally significant roosts are those roosts that have contained ≥ 10,000 Grey-headed Flying-foxes in more than one year in the last ten (10) years or have been occupied by more than 2,500 Grey-headed flying foxes permanently or seasonally every year for the last ten (10) years (Department of Agriculture Water and the Environment (2021). National Recovery Plan for the Grey-headed Flying-fox 'Pteropus poliocephalus').

- [redacted]
- The offset site is located in the same local government jurisdiction as the impact site (City of Ipswich). This means that the benefits of the offset are located in the regional context of the impact site.
- [redacted]

FIGURE 24: SITE POSITION RELATIVE TO STATE AND LOCAL PARKLAND, NATURE RESERVES, PROTECTED AREAS AND CORRIDOR BUFFERS (IPSWICH CITY COUNCIL 2006; DEPARTMENT OF ENVIRONMENT AND SCIENCE 2023).

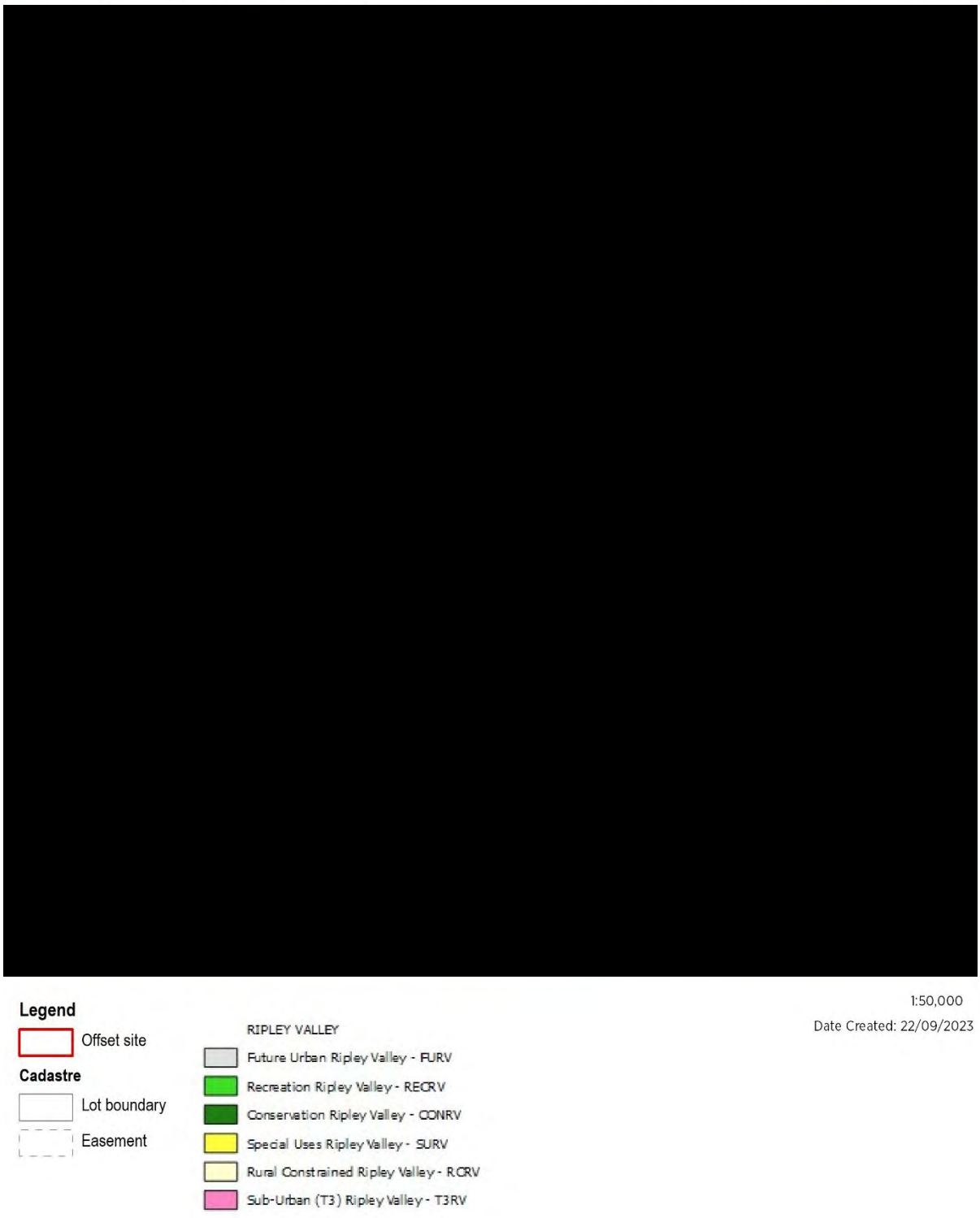


FIGURE 25: IPSWICH CITY COUNCIL PLANNING SCHEME PROPERTY ZONING IN THE [redacted] (IPSWICH CITY COUNCIL 2006).

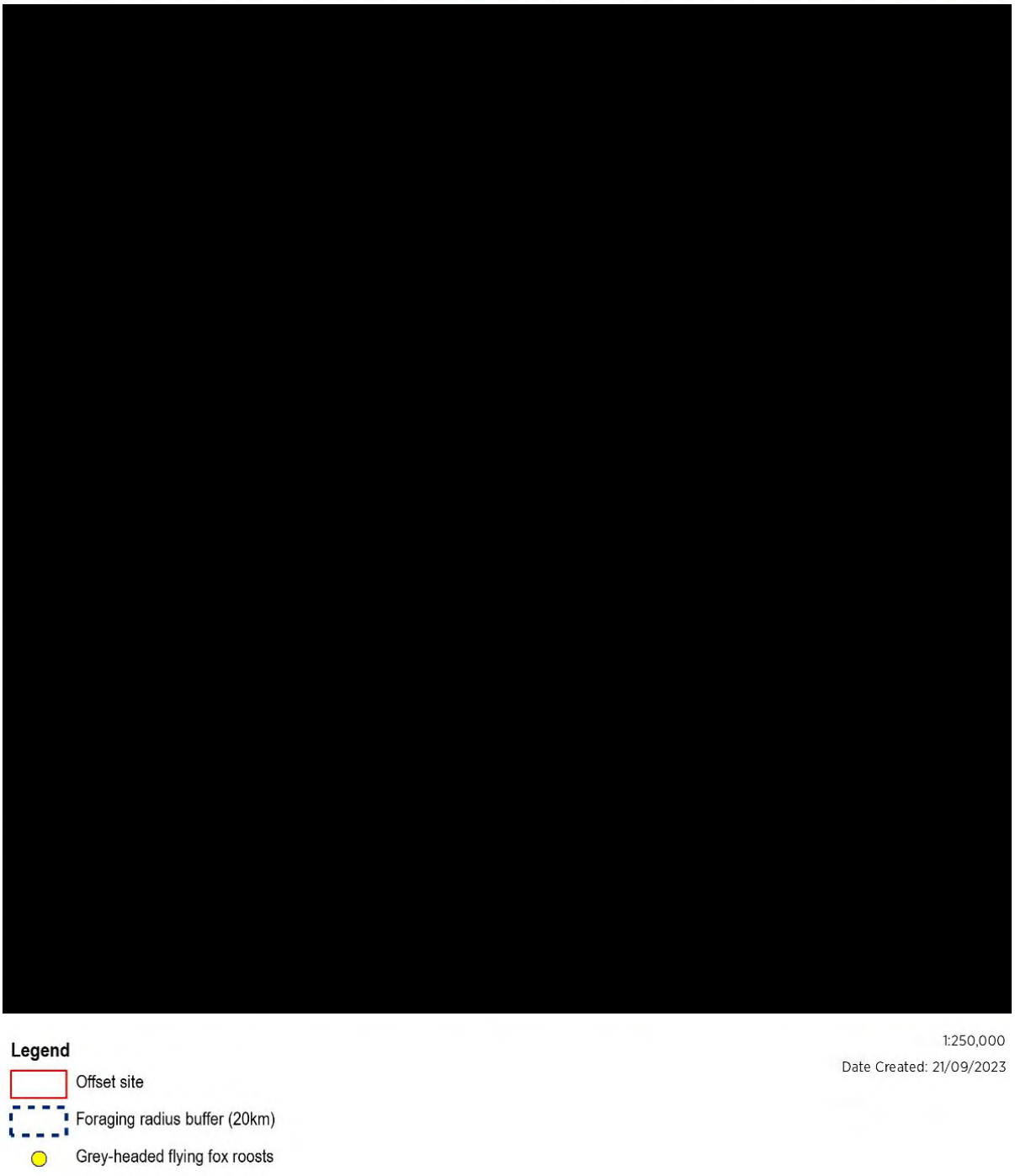


FIGURE 26: ROOSTS USED BY THE GHFF WITHIN 20 KM OF THE OFFSET SITE EITHER INTERMITTENTLY OR PERMANENTLY SINCE 2017 (AUSTRALIAN GOVERNMENT 2022)

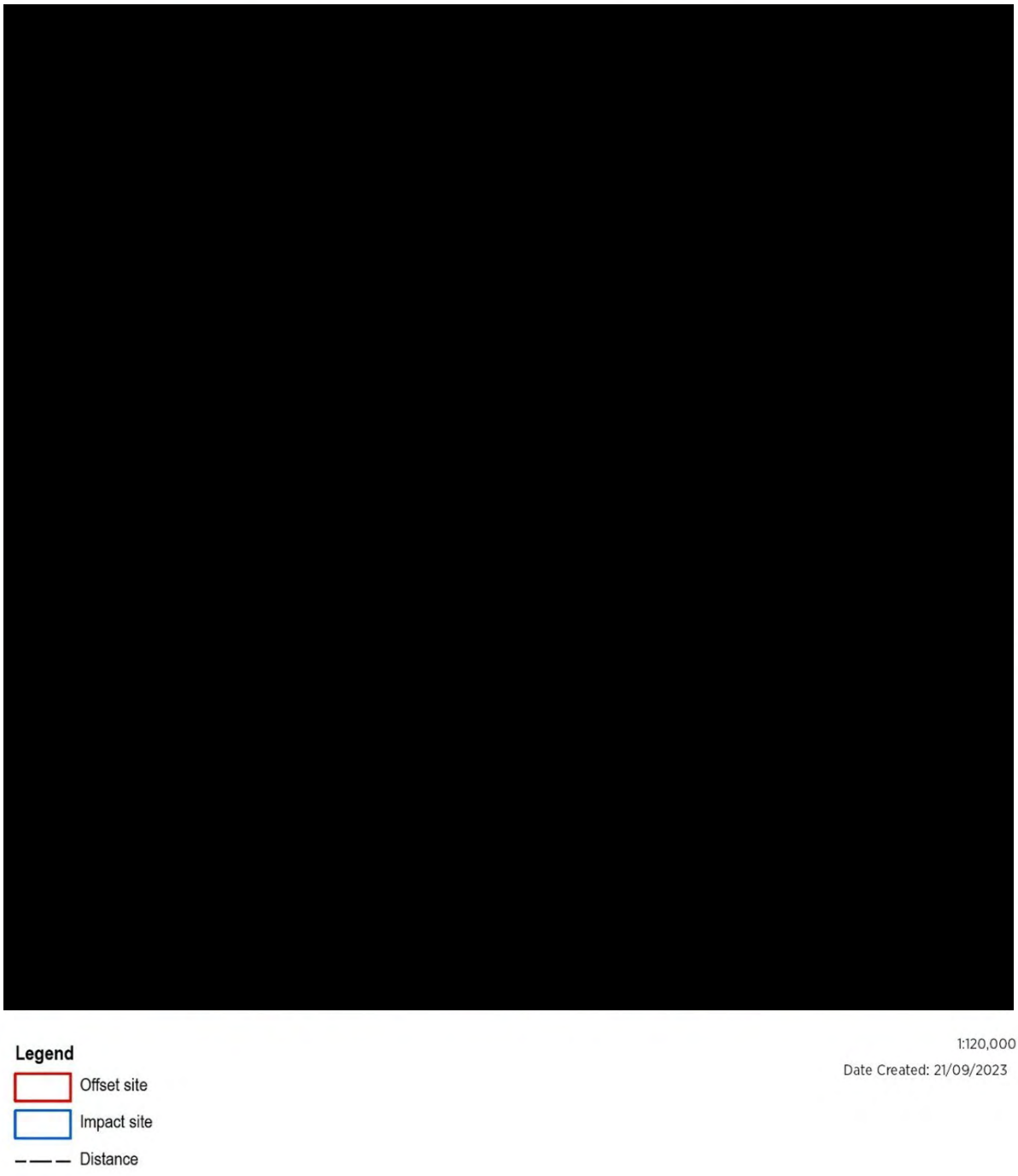


FIGURE 27: REGIONAL OFFSET SITE CONTEXT INCLUDING DISTANCE BETWEEN OFFSET AND IMPACT SITE (BASEMAP FROM IPSWICH CITY COUNCIL) (IPSWICH CITY COUNCIL 2006)).

14.2.2 EXISTING ENVIRONMENT

The following section contains more information about the existing environment at the offset site, including:

- Vegetation;
- Geology;
- Topography; and
- Waterways and wetlands

14.2.2.1 VEGETATION

The following section discusses the desktop and field survey methods and results related to the classification and assessment of vegetation on the offset site.

Methods

The offset site was assessed utilising a combination of desktop and field techniques. Botanical survey and assessment of threatening processes present were carried out on July 18 2023 by two (2) tertiary-qualified ecologists. The survey was conducted according to tertiary and quaternary methods described in *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland. Version* (Neldner *et al.* 2019). The purpose of the survey and assessment was to determine:

- The extent, type, diversity and integrity/condition of vegetation communities present;
- The presence of any threatened or conservation-significant plant species;
- Regional Ecosystems; and,
- The presence of exotic species including weeds.

In addition to field investigations, a desktop assessment of publicly available Light Detection and Ranging (LiDAR) point cloud data was conducted to ascertain tree heights and evaluate vegetation maturity across the offset site. LiDAR data (point cloud) was extracted from six (6) LiDAR point cloud tiles that intersected the site (State of Queensland (Department of Resources) 2023). The spatial resolution of the data included a point density of approximately one point every 15 centimetres, which yielded a total of 260 million points across the entire area. LiDAR data was used to generate both Digital Terrain Models (DTM) and Digital Surface Models (DSM). The point cloud data, capturing vertical distributions of laser returns from both the canopy and ground levels, allows for the precise computation of tree heights. Tree canopy height information derived from LiDAR supported an understanding of the relative maturity and developmental stages of the existing vegetation to supplement field evidence.

Results

Results of the field and desktop assessments indicated the following overall results:

- The offset site differs from mapped REs 12.9-10.7/12.9-10.2. The offset site is dominated in all areas by *Corymbia citriodora* and is consistent with RE 12.9-10.2.
- The offset site varies in condition; from locations that are cleared of almost all native vegetation and dominated by exotic species, particularly pasture grasses, to other locations that have almost no weeds and high native species richness.
- The maturity of vegetation tended to correlate with incline, such that remnant vegetation was found at higher altitudes and the flat areas of the offset site tended to be cleared and disturbed.
- In the waterways, vegetation reflects a mesic sub-type and is characterised by higher volumes of *Lophostemon* sp., *Casuarina* sp., and *Eucalyptus tereticornis.*
- Weed invasion is a key threat to the native vegetation on the offset site due to the pockets of land dominated by invasive grasses and forbes near native forests.
- There was evidence of a recent bushfire, although resulting in some death of young native trees, this had encouraged canopy recruitment since fire and reduced weed species competition, suggesting fire is a part of the ongoing natural ecology of the landscape.
- Some regions of the site contain taller trees over 30m in height, suggesting these areas have been less affected by timber harvesting and may represent old-growth forests.

As RE 12.9-10.2 varies in condition across the study area, the vegetation has been separated into four (4) condition types based on vegetation composition and quality, including disturbed, regrowth, mesic and remnant vegetation types.

Refer to Table 15 for a description of vegetation types and to Figure 28 for a map of vegetation types, and to Figure 29 for a map of canopy height derived from LiDAR. Refer to Figure 30, Figure 31, Figure 32 and Figure 33 for site photographs of remnant, mesic, regrowth and disturbed vegetation, respectively.

TABLE 15: DESCRIPTION OF VEGETATION CONDITION TYPES ON THE OFFSET SITE.

Vegetation type	Area (ha)	Description
Disturbed	13.7	Disturbed areas generally consisted of non-remnant vegetation consisting of scattered native canopy trees, a lack of shrubs and an understory dominated by exotic species including predominantly pasture grasses.
Mesic	21.2	Mesic vegetation consisted of tall (EDL 18-25 m) remnant vegetation characteristic of regional ecosystem 12.9-10.2 with an increased presence of characteristic species known to wetter environments including *Casuarina spp., Lophostemon suaveolens* and *Eucalyptus tereticornis.*
Regrowth	16.0	Regrowth vegetation generally consisted of low (EDL 10-16 m) dense vegetation characteristic of 12.9-10.2. The regrowth canopy consisted almost exclusively of *Corymbia citriodora.*

Vegetation type	Area (ha)	Description
Remnant	23.5	Remnant vegetation generally consisted of tall (EDL 16-22 m) open forests consisting of species characteristic of 12.9-10.2 and dominated by *Corymbia citriodora.*

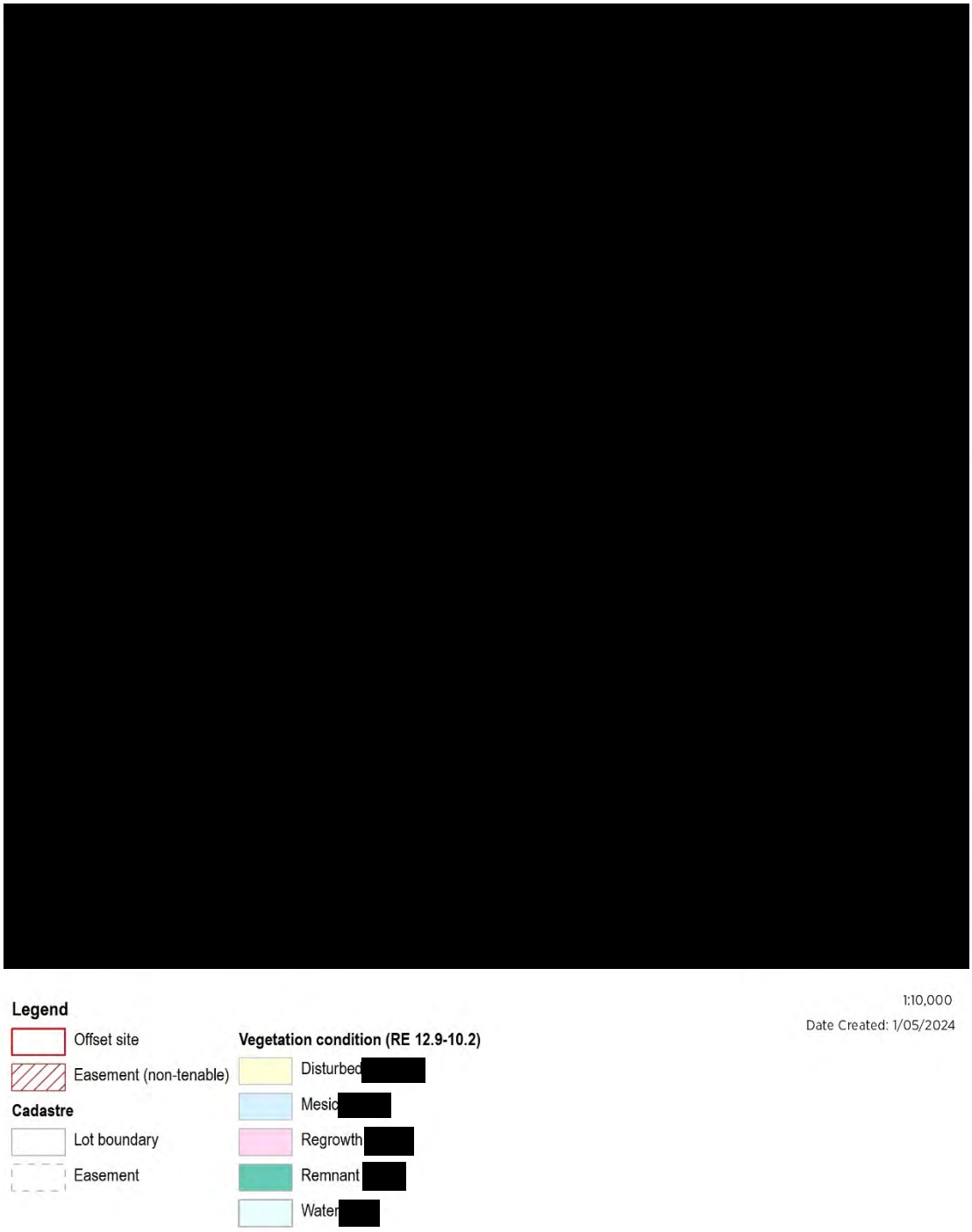


FIGURE 28: VEGETATION CONDITION.

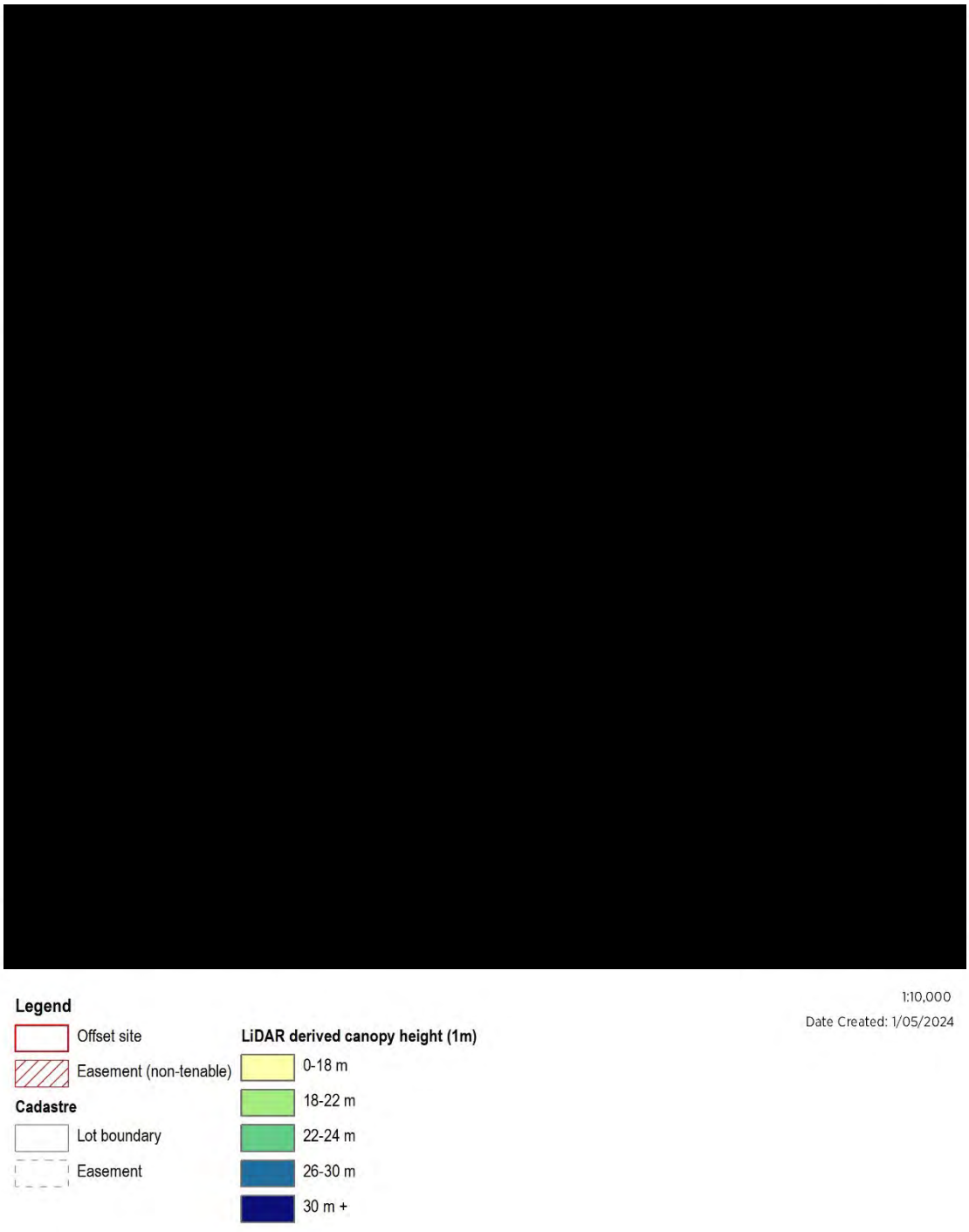


FIGURE 29: TREE CANOPY HEIGHTS DERIVED FROM LIDAR

FIGURE 30: REMNANT VEGETATION

FIGURE 31: MESIC VEGETATION

FIGURE 32: REGROWTH VEGETATION

FIGURE 33: DISTURBED VEGETATION

14.2.2.2 GEOLOGY

The offset site geology is wholly comprised of lithic labile and feldspathic labile sandstone, and the rock unit surface is known as *Gatton Sandstone* (Geological Survey of Queensland 2011). The majority of the impact site is also comprised of sandstone soil materials.

Assessment of the site geology suggests that both the offset and impact site support predominantly sandstone soils. As such, both sites support similar ecosystems based on the soil parent material, including RE 12.9-10.2.

Refer to Figure 34 for mapped offset site geology.

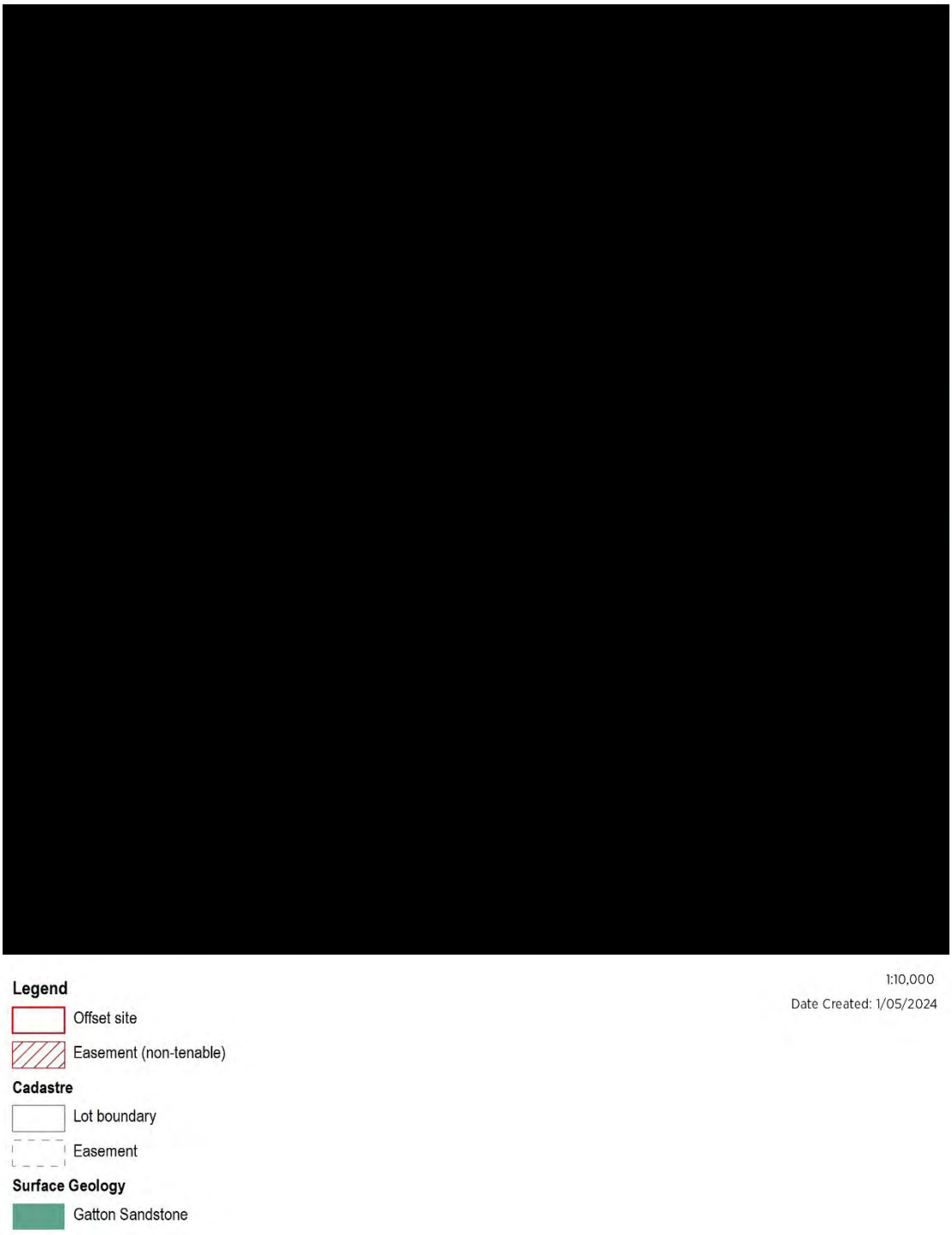


FIGURE 34: SURFACE GEOLOGY (DEPARTMENT OF NATURAL RESOURCES AND MINES 2013).

14.2.2.3 TOPOGRAPHY

Site contours as well as the DTM derived from LiDAR (LiDAR methodology described in Section 14.2.2.1) was assessed to determine the topography of the site. The DTM and contour data provided high-resolution information regarding site topography, including the location of gullies and waterways as well as terrain steepness.

The landform pattern of the offset site can be described as *undulating hills* (UH) according to the National Committee on Soil and Terrain (2009). The offset site exhibits a topographical gradient characterised by a decline in elevation from the southern boundary to the northern boundary, with much of the land lying between [redacted] above sea level. The site is bisected north to south by deep gullies formed by waterways.

Refer to Figure 35 for contour mapping (5m). Refer to Figure 29 for the DTM.

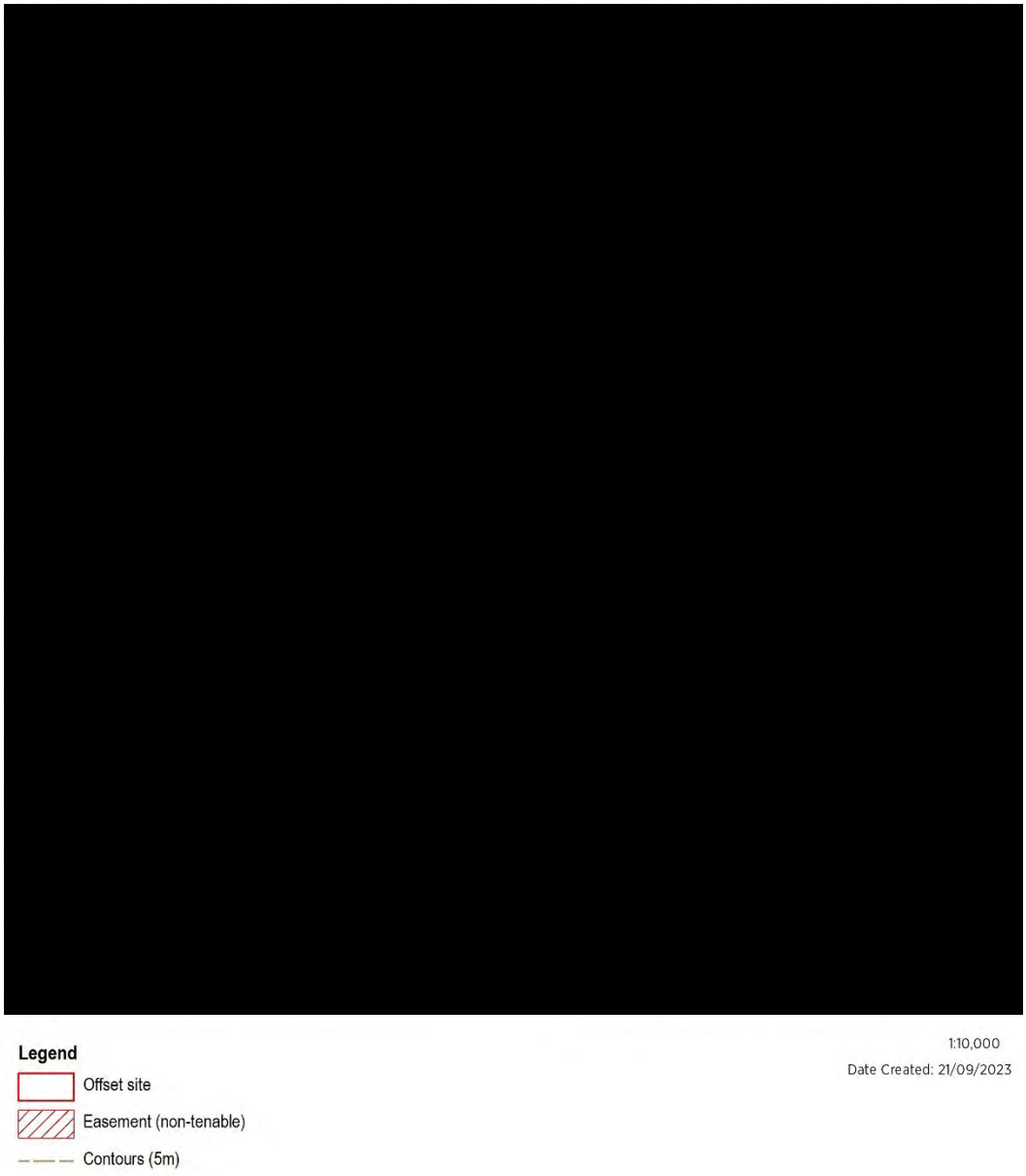


FIGURE 35: CONTOURS (0.5M) (DEPARTMENT OF NATURAL RESOURCES AND MINES 2016).

FIGURE 36: DIGITAL TERRAIN MODEL.

14.2.2.4 WATERWAYS AND WETLANDS

Ephemeral waterways (drainage channels) bisect the offset site from north to south. The waterways have caused significant natural channel erosion and the waterways are associated with significant furrows. The waterways are mapped under the Vegetation Management watercourse and drainage feature map v7.00 and are generally consistent with the mapping. No wetlands are mapped nor were observed on the offset site. Two man-made dams are also present in the disturbed areas (refer Figure 23).

FIGURE 37: VEGETATION MANAGEMENT STORMWATER AND DRAINAGE FEATURE MAP (DEPARTMENT OF NATURAL RESOURCES MINES AND ENERGY 2019).

14.2.3 GREY-HEADED FLYING-FOX HABITAT

The target MNES for the offset is the GHFF and its foraging habitat. In Section 14.2.1 it was established that the site is within the foraging range of the species. The following section assesses if the site contains or has the potential to contain foraging habitat for the species based on the outcome of the vegetation assessment. Refer to the PD Report for general information on the behaviour, habitat preferences and threats to the GHFF.

The offset site contains a mix of disturbed and intact vegetation and includes canopy species known to be foraging resources for the GHFF, including *Eucalyptus* spp. and *Corymbia* spp.

Habitat critical to the survival of the GHFF is defined in the National Recovery Plan (Department of Agriculture Water and the Environment 2021). Habitat critical to the survival of the species includes vegetation communities that support scarce winter and spring flowering food resources.

Habitat critical to the survival of the GHFF may also be vegetation communities that include the following (Department of Agriculture Water and the Environment 2021):

4. *Contain native species that are known to be productive as foraging habitats during the final weeks of gestation and during the weeks of birth, lactation and conception (August to May)*
5. *Contain native species used for foraging and occur within 20 km of a nationally important camp as identified on the Department's interactive flying-fox web viewer, or*
6. *Contain native and exotic species used for roosting at a nationally important GHFF campsite as identified on the Department's interactive flying-fox web viewer.*

The vegetation on the offset site was assessed against the above criteria for critical habitat in Table 16. In summary, the offset site is known to support trees that are productive during food shortages in winter and is within the foraging radius of several roosts utilised by the species; therefore, the vegetation is habitat critical to the survival of the species.

TABLE 16: ASSESSMENT OF HABITAT CRITICAL TO THE SPECIES' SURVIVAL ON STAGE 7.

Criteria for habitat critical to the survival of the species	Assessment of habitat critical to the survival of the species on the offset site
Contains vegetation that is known to support trees that are productive foraging food trees in winter.	The offset site contains the following tree species that are productive in winter and spring: • *Eucalyptus tereticornis* • *Corymbia citriodora*, and • *Eucalyptus crebra*.
Contain native species known to be productive as foraging habitats during the final weeks of gestation and the weeks of birth, lactation and conception.	
Contains native species used for foraging and occurs within 20 km of a nationally significant roost, as identified on the Department's interactive flying-fox web viewer.	The offset site does not occur within 20km of a Nationally Significant Roost; h[redacted]
Contain native and exotic species used for roosting at a nationally important GHFF campsite as identified on the Department's interactive flying-fox web viewer.	The offset site does not contain roosting habitat.

14.2.4 SUMMARY

In summary, the offset site is characterised as follows:

- The offset site geology is wholly comprised of lithic labile and feldspathic labile sandstone, and the rock unit surface is known as *Gatton Sandstone* (Geological Survey of Queensland 2011).
- The offset site exhibits a topographical gradient characterised by a decline in elevation from the southern boundary to the northern boundary.
- Ephemeral waterways (drainage channels) bisect the offset site from north to south, characterised by deep furrows in the soil (evident in Figure 35).
- The offset site differs from mapped REs 12.9-10.7/12.9-10.2 and is dominated in all areas by *Corymbia citriodora*, consistent with RE of 12.9-10.2.
- The offset site varies widely in vegetation condition and weed content.
- Weed invasion is a key threat to the native vegetation on the offset site due to the pockets of land dominated by invasive grasses and forbes near native forests.
- The vegetation condition is not uniform across the study area and a mesic sub-type exists inside waterway corridors. Therefore, the vegetation has been subdivided into four (4) assessment units based on vegetation quality and the mesic vegetation sub-type.
- The offset site is known to support trees that are productive during food shortages in winter and is within the foraging radius of several roosts utilised by the species; therefore, the vegetation is habitat critical to the survival of the species.

- The offset site is appropriately zoned (conservation) and because of this, it is not at risk from urban development itself. This means that the land is likely to be suitable as an environmental offset in the long term.
- [redacted]
- The offset site is located in the same local government jurisdiction as the impact site (City of Ipswich). This means that the benefits of the offset are located in the regional context of the impact and are not co-located with other bioregions.
- [redacted]

14.3 OFFSET ASSESSMENT

The following section describes the offset assessment. Offset assessment was undertaken using Department material and included the development of a species-specific method for offsetting impacts tailored to the habitat requirements of the GHFF. The following sections include:

- Assessment methods, and
- Assessment results.

14.3.1 METHODS

The offset methodology has been built on two (2) key documents provided by the Department, including:

- **The Modified Habitat Quality Assessment Tool (MHQAT)** is an assessment tool for assessing habitat quality for MNES that is an adaptation of the *BioCondition Assessment Manual: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland. Assessment Manual* (Eyre et al., 2015), which is a standard method of assessing habitat quality developed for Queensland REs. The MHQAT was adjusted by Litoria Consulting at the request of DCCEEW to suit the GHFF. An in-depth description of the species-specific method for measuring GHFF habitat quality can be found in Appendix 13.
- **The Offsets Assessment Guide spreadsheet (OAG)** is used to determine the offset area required to compensate for 100% of the impacts of the proposed development.

The MHQAT and OAG assessment methods are summarised below.

14.3.1.1 MODIFIED HABITAT QUALITY ASSESSMENT TOOL

Habitat quality at an impact and offset matter area is determined based on an assessment of the following attributes (State of Queensland 2017):

Site condition + Site context + Species stocking rate = Habitat quality score.

The default MHQAT spreadsheet is generalised so that it may be applied to various species. The MHQAT is an adapted version of the BioCondition assessment, and consists of the following measures:

- Site condition:
  - Recruitment of woody perennial species in EDL;
  - Native plant species richness – trees;
  - Native plant species richness – shrubs;
  - Native plant species richness – grasses;
  - Native plant species richness – forbes;
  - Tree canopy height (average of emergent, canopy, sub-canopy);
  - Tree canopy cover (average of emergent, canopy, sub-canopy);
  - Shrub canopy cover;
  - Native grass cover;
  - Organic litter;
  - Coarse woody debris;
  - Large trees (Eucalypt[8] + Non-eucalypt species);
  - Non-native plant cover;
  - Quality and availability of shelter;
  - Quality and availability of food and foraging habitat;
- Site context:
  - Size of patch;
  - Connectedness;
  - Context;
  - Ecological corridors;
  - Role of site location to species overall population in the state;
  - Threats to the species; and
  - Species mobility capacity.
- Species stocking rate:
  - Presence detected on or adjacent to the site (neighbouring property with connecting habitat);
  - Species usage of the site (habitat type & evidenced usage);
  - Approximate density (per ha); and
  - Role/importance of species population on site.

[8] Includes species in the genera: *Eucalyptus*, *Corymbia*, *Lophostemon,*

DCCEEW requires characteristics that are not defined and that vary between target MNES, such as threats, to be defined and weighted to suit the target MNES. Such measures include quality of shelter, quality of foraging habitat, threats to the species mobility capacity, etc.

For the GHFF, modifications were made to suit the following unique species characteristics, which are listed in the EPBC Administrative Guidelines on Significance, the National Recovery Plan (NRP) and the Species Profile and Threats Database (Department of the Environment and Heritage 2003; Department of Climate Change Energy the Environment and Water 2022):

- The GHFF is considered one population due to high genetic exchange and mobility across a unified range,
- The species is exclusively aerial and arboreal,
- Mobility and population dynamics are not influenced by terrestrial factors such as dispersal barriers and fragmentation,
- The GHFF rests, socialises and bears young in roosts (or camps) and leaves for foraging activity,
- Increasing the availability of winter foraging resources is crucial to species recovery objectives,
- Population numbers and roost locations are well understood and counted in an annual census, and
- The GHFF can travel very large distances in a single day to forage and return to roost (roughly 15-40km per day).

The MHQAT was designed to address the above characteristics per advice from the Department received on 14/10/2022 regarding the MQHA requiring:

- A balanced suite of metrics that capture both site and local-scale attributes,
- Attributes that can be applied at any location without site-specific bias,
- Attributes drawn from habitat preferences and threats identified in Statutory Documents,
- Re-weighting or removal of MHQAT metrics which are not deemed relevant to the GHFF's viability,
- Supplementary metrics specific to the needs of GHFF, including the availability and timing of flowering (such as winter-spring flowering resources),
- On-ground measures that can be aligned to management actions,
- Consideration of the upper-average foraging range of the species (up to 40km), and
- Re-weighting of measures and sections (condition, context and SSR) to reflect the influence on GHFF viability.

For an in-depth explanation of the method developed for the GHFF, refer to the Species-specific Methodology in Appendix 13 where the following has been provided:

- Justification of the overall weightings of site condition, site context, and species stocking rate for the habitat quality score;

- Descriptions of data collected in addition to BioCondition assessments to determine the quality of habitat for the GHFF to inform the additional data,
- A detailed explanation of the measures, weightings and scoring methods of site condition, site context and species stocking rate, including justification for all decisions.

The modified BioCondition assessment was undertaken generally in accordance with the methods described in *'BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland. Assessment Manual'* (Eyre et al., 2015).

Transects were established on the impact and offset sites across the vegetation types in Assessment Units (AUs) in accordance with the *Guide to Determining Terrestrial Habitat Quality: Methods for assessing Habitat Quality under the Queensland Environmental Offsets Policy* (v 1.3) (State of Queensland 2020) and *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland. Assessment Manual* (v 2.2) (Eyre *et al.* 2015). Where possible, transects were located in areas representative of the AU at least 1 km apart. At the transect locations, BioCondition data was collected as well as additional information to inform the GHFF habitat quality assessment per the Species-specific Methodology.

At both the impact and offset sites, the modified BioCondition assessment was undertaken over July-September 2023 over five days by two (2) tertiary qualified ecologists to assess vegetation condition:

- At the impact site, a total of seven (7) transects (100 x 50m) were established across the three AUs (refer to Figure 38).
- At the offset site, a total of eight (8) transects (100 x 50 m) were established across the four AUs (refer to Figure 39).

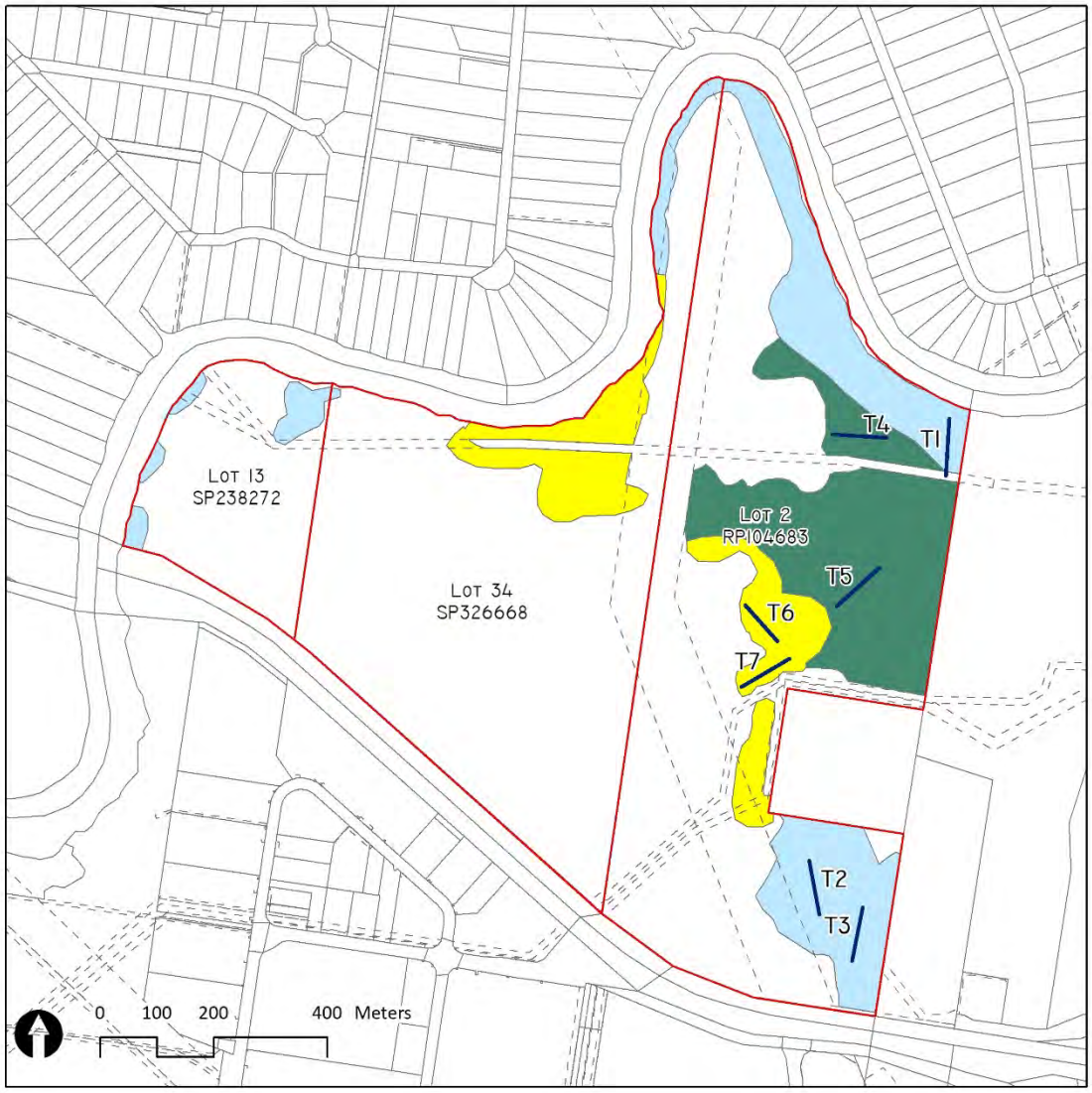


FIGURE 38: LOCATION OF IMPACT SITE BIOCONDITION ASSESSMENT TRANSECTS.

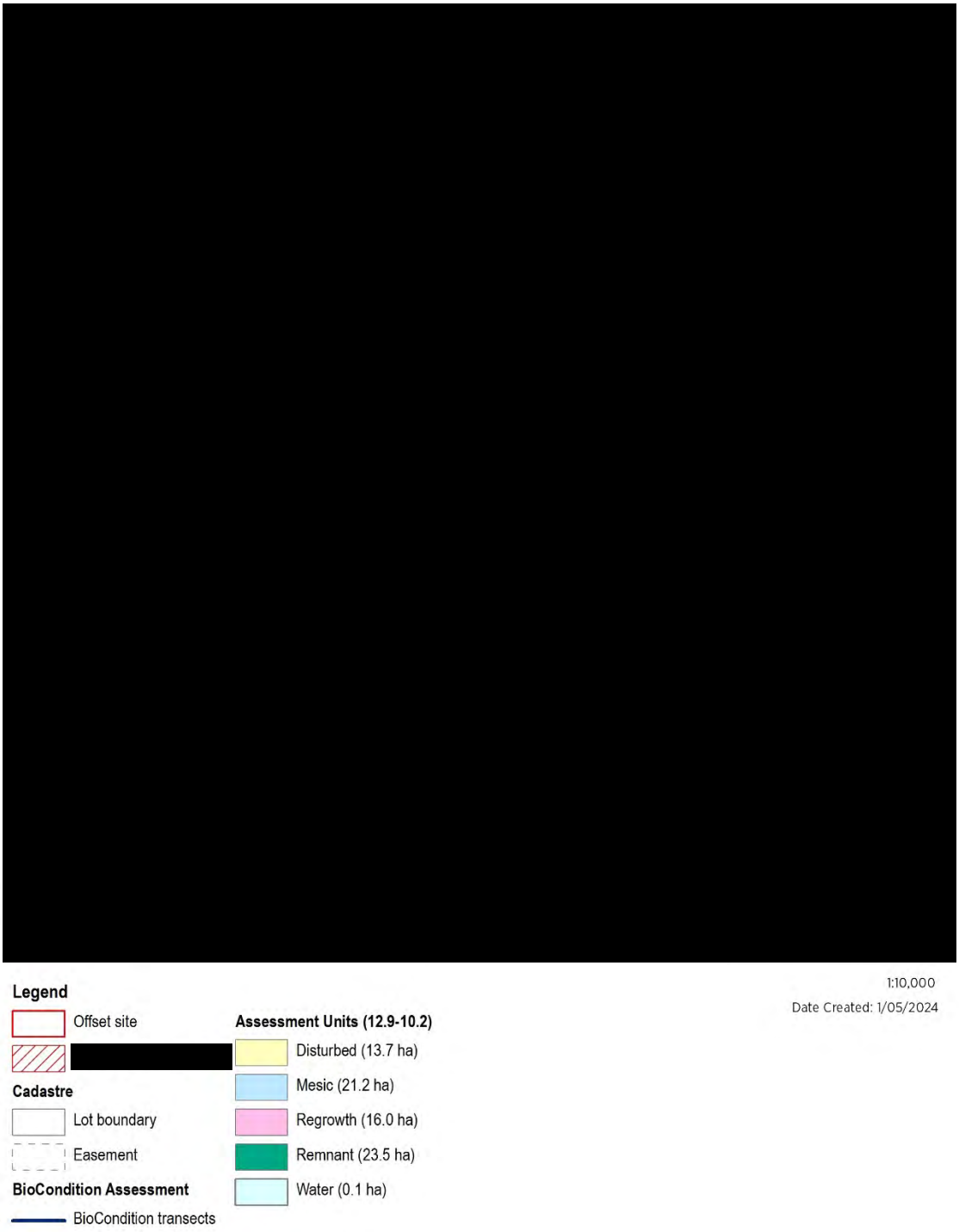


FIGURE 39: LOCATION OF OFFSET SITE BIOCONDITION ASSESSMENT TRANSECTS.

14.3.1.2 OFFSETS ASSESSMENT GUIDE

The Offsets Assessment Guide (OAG) spreadsheet has been completed to determine the offset area required to compensate for 100% of the impacts of the proposed development

on MNES. The OAG requires a series of inputs based on both impact and offset site characteristics which have been summarised and justified in Table 17.

TABLE 17: OAG INPUTS AND JUSTIFICATIONS.

Attribute	Assumption(s)
Listing status of impacted species	The listing status for the Grey-Headed Flying Fox is Vulnerable (annual probability of extinction = 0.2%).
Area of habitat impacted by the development	The area of habitat impacted by the development is 17.4 ha, as described in the PD Report.
Habitat quality at the impact site	Habitat quality at the impact site is 5/10 per the results of the MHQAT, see Section 14.3.2.1.
Starting habitat quality at the offset site	Habitat quality at the impact site is 5/10 per the results of the MHQAT, see Section 14.3.2.1.
Time horizon, or time until ecological benefit	Twenty (20) years have been utilised in the OAG to maximise time to achieve ecological outcomes and increase confidence in results. However, if ecological outcomes can be achieved before the 20-year goal, this could reduce the time horizon.
Habitat quality without offset	The offset site is privately owned and utilised for small-scale agistment and forestry. Part of the site is very weedy; other areas are in good condition. The habitat quality would likely remain the same as the starting habitat quality (5/10).
Final habitat quality at the offset site	The offset site will be managed over time and enriched with various foraging species, particularly winter-foraging food tree species. The starting habitat quality is five (5); therefore, the offset management has been designed such that the final habitat quality score reaches a minimum of seven (7).
Risk of loss (%) without offset	The Risk of Loss (ROL) without an offset is the likelihood that all ecological value at the offset site would be lost without the prospect of return if an offset is not secured. The prospect that all value on the site could be irreversibly lost without an offset is zero (0%).
Risk of loss (%) with offset	The risk of loss with offset is the likelihood of a net loss of biodiversity despite offset delivery. The prospect that all value on the site could be irreversibly lost after offset is zero (0%).
Confidence in result (%)	Based on the habitat quality score inputs, we have proposed an uplift of two (2) points and, therefore, a confidence level of 85%.

14.3.1.3 STATUTORY REQUIREMENTS

In addition to the habitat quality assessment, the proposed offset site has been assessed against the relevant requirements of the Department's EPBC Act Environmental Offsets Policy (2012) (Offsets Policy).

14.3.2 RESULTS

14.3.2.1 MODIFIED HABITAT QUALITY ASSESSMENT TOOL

The results of the MHQAT assessment are as follows:

- Habitat quality on the impact site: 5/10
- Habitat quality on the offset site: 5/10

To meet offset obligations for habitat quality improvement, the offset proposal includes a habitat quality uplift of two (2) points at the offset site. The final offset site score will be 7/10.

Refer to Appendix 14 for the results of the MHQAT.

14.3.2.2 OFFSETS ASSESSMENT GUIDE

The above results indicate that 54 ha will be required to meet 100% of the proponent's offset obligations for 17.4 ha of impacts to the GHFF.

Refer to Appendix 14 for the results of the OAG.

14.3.2.3 STATUTORY REQUIREMENTS

This section provides an assessment, with supporting evidence, of how the environmental offset meets the requirements of the Department's EPBC Act Environmental Offsets Policy (2012) (Offsets Policy). The offsets policy ensures the appropriateness and adequacy of the proposed offsets for listed threatened species and ecological communities. An assessment against the offset requirements is detailed in Table 18 below.

TABLE 18: ASSESSMENT OF HOW THE OFFSET MEETS THE REQUIREMENTS OF THE EPBC ACT ENVIRONMENTAL OFFSETS POLICY (2012) (OFFSETS POLICY).

EPBC Act offset policy requirement	Satisfaction of the requirement
Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matter.	The offset will provide an overall conservation outcome that improves or maintains the viability of the protected matter by: • Improving existing habitat for the protected matter by rehabilitating habitat on the offset site, particularly habitat critical to the survival of the species. • The offset will create new habitats for the protected matter by planting habitats in disturbed areas, focusing on establishing habitats critical to the survival of the species. • The offset will reduce threats to the protected matter by locating the rehabilitated habitat outside urban disturbances or priority development areas. • The offset site is appropriately zoned (conservation) and because of this, it is not at risk from urban development itself. This means that the land is likely to be suitable as an environmental offset in the long term.

	• [redacted] • The offset site is located in the same local government jurisdiction as the impact site (City of Ipswich). This means that the benefits of the offset are located in the regional context of the impact and are not co-located with other bioregions. • [redacted]
Suitable offsets must be built around direct offsets but may include other compensatory measures.	The proposed offset will be delivered by 100% direct offset and will not include other compensatory measures.
Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter.	The offset proposed for the GHFF is suitable for a species with a *Threatened* status as indicated by the *Offset Assessment Guide (v1.04.00)* spreadsheet provided by the DCCEWW (i.e., the multiplier applied to the offset area as is appropriate for a species with threatened status and an annual probability of extinction of 0.2%).
Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter.	The OAG *(v1.04.00)* has been utilised to indicate the size of the offset, incorporating all statutory recommendations and guidance for OAG inputs as required. The proposed offset is over three (3) times the size of the impact area in the same landscape and habitat type of the impact site. The offset is therefore proportional to the residual impacts on the protected matter according to the requirements of the OAG spreadsheet.
Suitable offsets must effectively account for and manage the risks of the offset not succeeding.	The offset targets will be effective for the species but reasonable and realistic in terms of offset delivery prospects. Habitat quality uplift is based primarily on planting and protecting target species which can be conducted with a high degree of confidence. The offset management plan will be based on goals at each offset stage and will ensure that adaptive management can be implemented such that the offset management plans remain flexible and targeted within the time until ecological benefit. Management specifications can be found in the Offset Management Plan (Appendix 1).
Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs.	The proposed offset is additional and does not provide benefits that are being counted towards any other offsets or management measures required by other regulatory bodies. An offset for Protected Plants under the *Nature Conservation Act 1992 (Qld)* for *Nature Conservation (Plants) Regulation 2020* may also be delivered on this site, involving a few hectares of planting of *Calyptochloa gracillima* subspecies *ipsviciencis;* however, rehabilitation of the grass is additional to the management measures undertaken to rehabilitate and establish habitat for the GHFF.

Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable.	Audits, contingency plans and adaptive management techniques will be enforced to ensure the offset is delivered before the conclusion of the currency period (time until ecological benefit). Management measures have been developed such that the improvements in habitat are based on best-practice vegetation rehabilitation standards, and the offset completion criteria have been based on the results of direct actions that can be implemented with a high degree of confidence. The species-specific methods have been based on a wide review of contemporary literature and federal material, i.e., the National Recovery Plan (Department of Agriculture Water and the Environment 2022) regarding the GHFF and has been tailored to be suitable and effective for the target species. Detailed information on the offset management, contingencies and completion criteria can be found in Appendix 1.
Suitable offsets must have transparent governance arrangements, readily measured, monitored, audited and enforced.	The governance framework for the offset is designed to be open and accessible, ensuring that all stakeholders can access the relevant information. Key performance indicators (KPIs), regular site assessments, third-party audits, and time-based management goals will be enforced to ensure the offset is transparent and meets the required targets. Adaptive management measures, including replacement planting, watering, and monitoring, will maintain the progression and success of the offset. Detailed information on responsible parties, monitoring and contingencies that allow for transparent enforcement can be found in Appendix 1.

14.3.3 SUMMARY

In summary, the results of the offset assessment are as follows:

- Habitat quality on the impact site: 5/10
- Habitat quality on the offset site: 5/10
- To meet offset obligations for habitat quality improvement, the offset proposal includes a habitat quality uplift of two (2) points at the offset site. The final offset site score will be 7/10.
- Integrating the results of the MHQAT with the OAG indicates that 54 ha will be required to meet 100% of the proponent's offset obligations for the GHFF for 17.4 ha of impacts to the species. The OAG spreadsheet can be found in Appendix 14.

The assessment of the site against the Department's EPBC Act Environmental Offsets Policy (2012) (Offsets Policy) suggests that the offset is appropriate due to the following considerations: site provides a direct conservation outcome for the species and maintains or improves species viability by enhancing and protecting habitat critical to the survival of the species.

- The scale of the offset is appropriately sized according to the OAG and is proportional to the residual impacts on the species.
- The Offset Management Plan will include thorough risk management, auditing, contingency and adaptive management planning to ensure offset delivery.
- Improving existing habitat for the protected matter by rehabilitating habitat on the offset site, particularly habitat critical to the survival of the species.
- The offset will create new habitats for the protected matter by planting habitats in disturbed areas, focusing on establishing habitats critical to the survival of the species.
- The offset will reduce threats to the protected matter by locating the rehabilitated habitat outside urban disturbances or priority development areas.
- The offset site is appropriately zoned (conservation) and because of this, it is not at risk from urban development itself. This means that the land is likely to be suitable as an environmental offset in the long term.
- [redacted]
- The offset site and impact site are like-for-like due to the following key reasons:
  - The offset and impact site both support critical habitat for the GHFF.
  - The offset site supports the same habitat type as most of the cleared habitats on the impact site (RE 12.9-102).
  - [redacted]
  - The offset site is located in the same local government jurisdiction as the impact site (City of Ipswich). This means that the benefits of the offset are located in the regional context of the impact.

14.4 PROPOSED OFFSET

The following section outlines the proposed sub-area of the offset site over which the offset will be completed (Offset Area). The results of the offset assessment determined that to compensate for the impacts of the proposed action, 54 ha of offset area will be required to compensate for the significant residual impacts of the proposed action with a proposed two (2) point habitat quality uplift.

The proposed Offset Areas is situated over a sub-section of the offset site and are positioned to include disturbed areas and regrowth areas primarily, while also containing some mesic and remnant vegetated areas. The Offset Area has been positioned primarily over habitats of lesser quality to provide more benefit through rehabilitation activities. The proposed Offset Area is [redacted] in size, rounded to the nearest whole hectare to allow for minor locational measurement discrepancies and for absolute confidence that the

proponent's responsibility is satisfied. The balance of the land [redacted] is comprised of the [redacted] remnant and regrowth land not proposed to be included in the Offset Area. The northern, western and southern-western boundaries of the proposed Offset Area are congruent with the northern and western boundaries of the offset site, and the northern boundary of the [redacted]. The eastern and southern boundaries of the Offset Area are parallel with the eastern and southern boundaries of the offset site [redacted]. All assessment units in the proposed offset area contain or are suitable to contain critical foraging habitat for the GHFF.

The coordinates of the boundary points of the Offset Area are located at the decimal degrees described in Table 19. Refer to Figure 40 for a map of the proposed Offset Area. Shapefiles of the proposed Offset Area will be included as an attachment with this submission to DCCEEW.

TABLE 19: COORDINATES IN DECIMAL DEGREES (IN PROJECTION EPSG:7856 GDA2020 MGA ZONE 56)OF THE BOUNDARY POINTS OF THE PROPOSED OFFSET AREA.

Coordinate ID	Description	X Coordinate	Y Coordinate
A	NW corner of the Offset Area	[redacted]	[redacted]
B	NE corner of the Offset Area	[redacted]	[redacted]
C	SW corner of the offset area	[redacted]	[redacted]
D	South (central) corner of the offset area	[redacted]	[redacted]
E	SE corner of the Offset Area	[redacted]	[redacted]

FIGURE 40: MAP OF THE PROPOSED OFFSET AREA AND ASSESSMENT UNITS.

14.5 CONSERVATION OUTCOME

Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matter (Department of Environment and Science 2018), in this case, the GHFF. In order to deliver a conservation gain, offsets should be customised to offset the specific matter that has been impacted, in this case, habitat critical to the survival of the GHFF. A conservation gain may be achieved by (Department of Environment and Science 2018):

1. Improving existing habitat for the protected matter,
2. Creating new habitats for the protected matter,
3. Reducing threats to the protected matter,
4. Increasing the values of a heritage place, and/or,
5. Averting the loss of a protected matter or its habitat that is under threat.

In this instance, a conservation gain will be achieved by:

6. Improving existing habitat with supplementary planting;
7. Creating new habitat within cleared and disturbed areas; and
8. Controlling weeds to reduce threats to foraging habitat.

Statutory documentation identifies that loss of critical foraging habitat is a primary threat to the species. An understanding of desirable foraging habitat characteristics has been established by a review of federal material on the species as well as a literature review of the species' preferences. Specifically, the conservation gain will improve habitat values that are considered critical to the GHFF as per the *National Recovery Plan for the Grey-headed Flying-fox (Department of Agriculture Water and the Environment 2021).* This addresses *Recovery Objective 1* (one) of the aforementioned document, which is to protect and increase native foraging habitat that is critical to the survival of the GHFF. This objective is achieved by improving characteristics that underpin the quality of foraging habitat for the species, specifically, by maximising the following primary indicators from the federally endorsed research paper *Ranking the feeding habitats of Grey-headed flying foxes for conservation management* (Eby 2008) including:

9. Food tree productivity (volume of blossom nectar, indicated by flower scores),
10. Food tree reliability (frequency and synchrony of flowering, indicated by flower scores),
11. The density of fruiting trees,
12. Seasonal continuity of resource availability (timing of flowering, which is particularly in winter, indicated by flowering windows), and
13. Maximising modified BioCondition scores to ensure the rehabilitated habitat comprises a wholly functional and, therefore, resilient bushland ecosystem.

This conservation gain will be completed by utilising four different management approaches for each assessment unit, utilising appropriate regimes for the enhancement of disturbed, regrowth, mesic and remnant assessment units.

14.6 LEGALLY SECURED OFFSET AREA

The offset site is currently privately owned under freehold tenure. For the duration of the currency period, the offset will be under the tenure of Walker Bremer Park Pty Ltd. The impacts of the development are permanent; hence the offset will be reserved in perpetuity.

A Voluntary Declaration, and/or as required, an Environmental Covenant will be secured under State law to secure the offset area. The Voluntary Declaration will be attained post-approval but before the commencement of works. The proponent will await further advice from DCCEEW to determine if the Voluntary Declaration is sufficient, or if the Offset Proponent should proceed with securing an Environmental Covenant. A covenant is registered against the title and survey plan of a property and administered under the Land Titles Act 1994 (Qld).

Please see Appendix 15 for the contract of sale held between Walker Bremer Park Pty Ltd and the landholder over the proposed offset site that confirms the tenure of the land subject to the approval of the PD Report (Litoria Consulting, November 2023) and the proposed offset.

15 EXECUTIVE SUMMARY

This Preliminary Documentation Report (PD Report) has been prepared by Litoria Consulting on behalf of Walker Bremer Park Pty Ltd for the Citiswich Estate commercial development located at Warrego Highway, Bundamba, Queensland. The Citiswich Estate development is comprised of seven (7) stages, of which the subject of the report is Stage 7 (Lot 13 SP 238272, Lot 34 SP 326668, and Lot 2 RP 104683).

The purpose of this PD Report is to provide additional information requested by the Department as part of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) referral (EPBC 2021/9135) and expand on the information provided in the Matters of National Environmental Significance Report (MNES Report) (Litoria Consulting, December 2021).

This PD Report is based on qualitative and quantitative evidence to support the assessment of residual significant impacts on identified MNES. Detailed assessment has been provided for listed threatened species that the Department considers likely to be significantly impacted by the proposed action, including the Grey-headed flying fox (*Pteropus poliocephalus – Vulnerable).*

The PD Report evaluated the potential impacts before, during, and after construction, along with the associated management strategies, for the proposed development. An assessment of the likely significance of residual impacts on the above MNES was completed in accordance with the Significant Impact Guidelines (Department of the Environment 2013b) and species-specific guidelines where relevant.

A residual significant impact on the GHFF as a result of the proposed development has been identified despite proposed impact avoidance, minimisation and mitigation strategies. The development can control construction and operational impacts for light, noise, dust, and edge effects, such that there is no significance of these impacts. However, the unavoidable outcome of the development involves the loss of 17.4 hectares of critical winter foraging habitat for the species. As the impacts cannot be avoided, minimised, or mitigated, an offset has been proposed.

An Offset Management Plan (Appendix 1) has been prepared, which demonstrates how the proposed offset is to be delivered on the ground.

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