Calderwood Mod 4 Referral - Supporting Documentation

Prepared for Lendlease Communities (Calderwood) Pty Ltd

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Template 2.8.1

Contents

List of Figures

Figure attached as a separate Appendix. Please see Appendix C.

No table of figures entries found.

List of Tables

1. Introduction

1.1 Project Industry Type

Residential development.

1.2 Provide a detailed description of the proposed action, including all proposed activities

Lendlease Communities (Calderwood) Pty Ltd (LLC) are proposing to develop a residential and commercial subdivision; including all associated ancillary infrastructure (Appendix C, Figure 1 page 1, Figure 2 Page 2). The proposed site is located within the existing Calderwood Urban Development Project (CUDP), previously referred to the Commonwealth on 2 March 2010 (EPBC 2010/5381). The Commonwealth determined that the proposed action was not a controlled action on 30 March 2010 and further assessment and approval under the EPBC Act was not required. Since this decision was made, Lendlease Communities (Calderwood) lodged a modification (Mod 4) to the existing transitional Part 3A Concept Plan approval for NSW DPIE approval under the *Environmental Planning and Assessment Act 1979* (EP&A Act). Mod 4 was approved on 21 May 2021. As a result, limited areas of the CUDP now differ to the previously referred action. In order to take a precautionary approach and as a matter of abundant caution, LLC now submits this referral. Early consultation with the Department was carried out in 2020, and again in April 2021.

Mod 4 increases the lot yield across some stages of the Project, which are focused in and around the future town centre. This referral focuses on the areas which are affected by Mod 4. Although the lot yield is proposed to increase, the development footprint has not increased with all impacts contained within the existing footprint, which had been submitted as part of the 2010 referral. The proposed action covers the following stages of the CUDP: stages 4, Town Centre East, Town Centre South, Town Centre North, Town Centre Core 7A and 7B, 8-12 (Appendix C, Figure 3, page 3).

The remaining stages of the CUDP are not affected by Mod 4 and as such are not included in this referral. LLC may prepare a separate referral for these stages if necessary.

This referral thus covers the stages affected by Mod 4, being stages:

- 4
- Town Centre East
- Town Centre South
- Town Centre North
- Town Centre Core
- 7A and 7B, 8-12.

For the purposes of this report, the aforementioned stages will be referred to as the 'action area'. The proposed action encompasses the action area, which will be completed over approximately 10 years. Development will deliver a variety of lot sizes and dwelling types based upon current market demand for smaller housing / lot sizes; as well as a town centre with commercial and retail floor space and community parks. The majority of existing native vegetation will be retained within the action area, namely the existing patches of Illawarra and South Coast Lowland Forest and Woodland and the native vegetation along Marshall Mount Creek (Appendix C, Figure 4, page 4). To facilitate the residential

development, extensions and upgrades of associated supporting infrastructure and services will be required. More specifically, the proposed action will involve:

- site preparation (earthworks and grading and associated noise, light and dust disturbance)
- residential lots in proximity to the existing township already completed at the CUDP
- town centre with large commercial and retail floor space
- utilities and services
- roads, bridge and pathways
- car parks and local parks / open space
- ancillary infrastructure
- conservation land protection.

To facilitate these works, clearing of native vegetation will be required. Impacts to MNES as a result of result of clearing is described in Appendix A, Section 2.4.

1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action

Upload shapefiles to online portal.

1.4 Please upload images of the proposed action area (including disturbance footprint, avoidance footprint (if relevant) and MNES habitat area/s) and if available a compliant GIS file. The accepted file types are: zip .kml, .kmz, .shp, .pdf, .png, .gif, .jpg

Upload to the online portal.

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for offshore actions, shortest distance to mainland)

The action area forms part of the CUDP and is in the Calderwood Valley, in the Illawarra Region of NSW; approximately 20 km south west of Wollongong. The Calderwood Valley is bound by rural land to the north, east and west, the remaining stages of the CUDP to the south and to the south and south east, the existing suburbs of Tullimbar and Albion Park Marshall Mount Creek runs through the centre of the action area. Existing main roads include Calderwood Road, Mount Marshall Road and Escarpment Drive. A majority of the action area is comprised of land previously used for agricultural purposes and is dominated by exotic pasture grass. The action area also contains remnant patches of native vegetation.

1.6 What is the size of the development footprint or work area?

The action area is approximately 299.97 ha, with 217.62 ha proposed for development (development footprint / disturbance footprint) and 82.35 ha proposed for retention for open space and conservation purposes.

1.7 Is the proposed action a street address or lot?

The proposed action occurs across the following lots:

- Lot 2 DP 2534
- Lot 22 DP 809156
- Lot 1 DP 439059
- Lot 2 DP 158988
- Lot 1 DP 1044038
- Lot 112 DP851153
- Lot 3328 DP1225478
- Lot 3129 1225477
- Lot 11 DP1237642
- Lot 1 DP195342.

1.8 Primary Jurisdiction

NSW.

1.9 Has the person proposing to take the action received any Australian Government funding to undertake this project?

No.

1.10 Is the proposed action subject to local government approval?

Yes. A Development Application to either Wollongong or Shellharbour Council will be required for each of the stages identified in the area of the proposed action.

1.10.1 Is there a local government area and council contact for the proposal?

No.

1.11 Provide an estimated start and estimated end date for the proposed action

Subject to approval, works are scheduled to commence in 2021 and complete in 2033.

1.12 Provide details of the context, planning framework and State and/or Local government requirements

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal planning legislation that relates to the proposed development. It provides a framework for the overall environmental planning and assessment of development proposed actions. Various legislative instruments, such as the NSW *Biodiversity Conservation Act 2016* (BC Act), *Water Management Act 2000* (WM Act) and *Rural Fires Act 2007* (RF Act) are integrated with the EP&A Act and have been reviewed separately.

State

Environmental Planning and Assessment Act 1979 (EP&A Act)

On 8 December 2010 the NSW Minister for Planning determined (with modifications) the Approved Concept Plan under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Following approval of the Concept Plan, on 14 January 2011 Schedule 3 of *State Environmental Planning Policy (Major Development) 2005* (now the State Significant Precincts SEPP) was amended to establish zoning and other planning controls for the CUDP. A Consolidated Concept Plan was prepared in March 2011 and together; the planning controls at Schedule 3 of the State Significant Precincts SEPP and the Approved Concept Plan, establish the statutory planning regime for the development of the CUDP.

A request to modify the Approved Concept Plan was submitted to the then NSW Department of Planning and Environment (now Department of Planning, Industry and Environment (DPIE)) in November 2017 (Mod 4) and Secretary's Environmental Assessment Requirements (SEARs) were issued on 1 February 2018. Mod 4 was submitted to provide more diverse dwellings including increasing the dwelling yield. The S75W modification (Mod 4) was exhibited from 12 September 2018 to 11 October 2018. The Response to Submissions was lodged with DPIE on 31 May 2019. Mod 4 received approval on 21 May 2021.

Other legislation relevant to the proposed action include:

- *Biodiversity Conservation Act 2016 (BC Act)*
- *Water Management Act 2000 (WM Act)*
- *Fisheries Management Act 1994 (FM Act)*

Local

- Wollongong Council Local Environmental Plan
- Shellharbour Council Local Environmental Plan.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders

The S75W modification (Mod 4) to the CUDP was exhibited from 12 September 2018 to 11 October 2018. The Response to Submissions was lodged with the DPIE on 31 May 2019. As part of the original referral for the CUDP (EPBC 2010/5381), consultation and a survey program for indigenous heritage matters relating to the site was conducted by Kelleher Nightingale Consulting (Appendix F).

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project.

Numerous field surveys and impact assessments have been conducted for the site:

- Eco Logical Australia 2010. Calderwood Urban Development Project – Flora and Fauna Assessment. Prepared for Delfin Lendlease.
- Eco Logical Australia 2012. Targeted survey of *Pterostylis gibbosa* (Illawarra Greenhood) for the Calderwood Urban Development Project. Prepared for Lendlease.
- Eco Logical Australia 2018. Validation of *Environment Protection and Biodiversity Conservation Act 1999* listed Illawarra and South Coast Lowland Forest and Woodland, Calderwood Urban Development Project. Prepared for Lendlease.

- Eco Logical Australia 2018. Modification to Calderwood Part 3A Concept Plan Biodiversity Assessment. Prepared for Lendlease.

FIELD METHODOLOGY

Field surveys were completed across the action area and aimed to identify any threatened ecological values present. Surveys were conducted consistent with the EPBC Act survey guidelines (where relevant), the Draft Threatened Species Survey Guidelines (DECC 2004) and were conducted across the CUDP. Surveys included:

- vegetation validation including type, condition and extent
- threatened species habitat assessment
- targeted survey for threatened flora
- targeted survey for threatened fauna.

Desktop literature and data review

A desktop literature review was undertaken to determine the location and extent of previous surveys, indicative type and extent of vegetation and identify the presence of any Matters of National Environmental Significance (MNES) listed under the EPBC Act that could potentially occur within the action area. The following documentation and mapping was reviewed:

- search of Atlas of NSW Wildlife (10km distance out from the CUDP boundary conducted 9 October 2009, 2 May 2018 and 13 January 2021)
- Commonwealth protected matters search tool (10 km radius from coordinates -34.56, 150.73 conducted 8 October 2009, 2 May 2018 and 13 January 2021)
- collation of available GIS information
    - NPWS validated vegetation mapping (2004)
    - Threatened Species Atlas records (2009, 2018, 2021)
    - EPBC Act Protected Matters records (2009, 2018, 2021)
    - SEPP 14 (now Coastal Management SEPP) Wetland locations
    - aerial Photos
    - DIPNR and updated modelled drainage networks.

The results of the literature and data review were used to prepare a likelihood of occurrence table to determine MNES predicted as likely to occur in the CUDP and action area (Appendix A). The likelihood of occurrence table was used to determine the survey effort required across the action area.

- One day field reconnaissance to assess the local environment and identify target areas for field survey
- Preparation of field survey plan to ensure a representative sample of all habitats and targeted sampling of habitats that are likely to contain threatened species.

Vegetation validation

Vegetation validation was conducted across the action area in 2009, 2018 and 2021 (Appendix A, Table 3, page 14). A seven (7) person day field survey was completed across the action area in 2009 which employed the random meander method to validate vegetation community and condition mapping (each

polygon mapped as part of the desktop assessment was visited). Vegetation condition was determined using the rules outlined in Table 1 and the vegetation present was assigned to the best fit mapping units consistent with the NPWS 2004 vegetation mapping. The rules outlined in Table 1 are based on the NPWS vegetation mapping codes for regional vegetation mapping projects.

Prior to the 2018 field survey, an assessment was completed to determine the relationship between the previously validated vegetation communities (ELA 2010) and any EPBC Act listed communities (Appendix A, Table 2, page 12). This was completed by reviewing the NPWS 2004 mapping unit descriptions, the BC Act Final Determinations and the EPBC Act conservation advice and listing advice for Illawarra and South Coast Lowland Forest and Woodland and River-flat Eucalypt Forest. The assessment determined that Lowland Woollybutt Melaleuca Forest and Riparian River Oak Forest can both be associated with EPBC Act listed communities. This was used to identify patches of vegetation in the action area that required additional survey.

Table 1: Rules used to determine vegetation condition during the 2010 survey (ELA 2010)

Condition code	Condition description	Indicates the following patterns*
A**	Low Disturbance	No visible signs of disturbance from air. Polygon may have some established tracks dissecting. Evidence of weeds may not be visible or only identified during field investigation, generally at low intensity. Gaps in canopy are more likely to be natural dynamic between rainforest/eucalypt structures.
B	Moderate Disturbance	A polygon may exhibit >75% integrity in forest canopy structure but contains features such as single or multiple canopy gaps where weed infestations have developed from light penetration. The polygon may also be marked by several poorly developed trails dissecting path or evidence of human disturbance such as clearing or understorey patchiness Includes areas of regenerating vegetation
C	High Disturbance, Regenerating vegetation	Common around areas of previous mining and clearing. Dense weed infestations dominate the understorey or canopy. Structure of vegetation is limited to canopy and dense weed understorey. In some areas canopy may include exotic species amongst natives. Canopy gaps are clearly apparent, and evidence of soil disturbance may be apparent, as may be evidence of previous mining activities or clearing.
TX	Scattered trees (thinned canopy)	A regular feature of native vegetation cover in disturbed environments is the presence of scattered trees above an open or absent understorey in a mosaic of cleared and remnant vegetation. A code "Tx" was applied where Crown Canopy Projected Density (CCPD) of tree cover fell below ten percent. A minimum mapping area of 0.5 hectares was used.
EX	Excluded from assessment process	Excluded map units are: Cleared, Modified Lands, Water, Weeds and Exotics

Table 2: Relationship between NPWS 2004 vegetation communities and EPBC Act listed communities

Sub-community (NPWS 2004)	PCT association	BC Act listed community	EPBC Act listed community
Artificial Wetland	N/A	N/A	N/A

Sub-community (NPWS 2004)	PCT association	BC Act listed community	EPBC Act listed community
Lowland Woollybutt Melaleuca Forest	PCT 1326 Woollybutt - White Stringybark - Forest Red Gum grassy woodland on coastal lowlands, southern Sydney Basin Bioregion and South East Corner Bioregion	Illawarra Lowlands Grassy Woodland	Illawarra and South Coast Lowland Forest and Woodland
Riparian River Oak Forest	PCT 835 Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	River-flat Eucalypt Forest	River-flat Eucalypt Forest
Weeds and Exotics.	N/A	N/A	N/A

The results of the 2009 field survey were used as a base map for all future survey. Survey was conducted by ELA in 2018 and 2021 to determine the extent of EPBC Act listed *Illawarra and South Coast Lowland Forest and Woodland* and *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria* across the CUDP. The 2018 surveys were limited to areas of each stage that had previously been mapped as vegetation communities likely to correspond with Illawarra and South Coast Lowland Forest and Woodland; Lowland Woollybutt Melaleuca Forest (ELA 2010; Appendix A, Table 2, page 12). Each patch was assessed against the condition thresholds listed in the *Approved Conservation Advice for Illawarra and South Coast Lowland Forest and Woodland* (DotEE 2016; Appendix A, Table 5, page 21). Each patch was traversed to document the following:

- presence of structural layers
- presence of large trees or trees with hollows
- species present in groundcover (native or exotic) including estimations of percentage of cover for native species
- contiguity of the patch with other patches in the surrounding landscape.

Where patches were in proximity to other patches of Illawarra and South Coast Lowland Forest and Woodland a rapid assessment of the neighbouring patch was conducted to determine whether it would meet the EPBC Act definition of the community. This allowed accurate mapping of all 30 m buffers to all Illawarra and South Coast Lowland Forest and Woodland. A 30 m buffer was applied to all EPBC Act patches to be consistent with the Approved Conservation Advice (DotEE 2016). Where existing vegetation polygons required refining, they were re-mapped using Arc Collector 10.2 while out in the field.

The 2021 field survey was limited to the vegetation along Marshall Mount Creek that was previously mapped as Riparian River-oak Forest (ELA 2010; Appendix A, Table 2 page 12; Appendix C, Figure 5, page 5). The vegetation was assessed against the condition thresholds listed in *Conservation Advice for the River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria* (DAWE 2020) by completing a random meander along all accessible portions of the creek. Two full

floristic vegetation plots consistent with the NSW Biodiversity Assessment Method were also completed to determine the composition and structure of the patch. This assessment included documenting all flora species present, their relative cover and abundance in a 20 m x 20 m plot, and the presence / absence of hollows, fallen logs and leaf litter in a 20 x 50 m plot.

Consistent with the conservation advice thresholds, the following was considered during the field survey:

- has a canopy dominated by one or a combination of the following species: *Angophora floribunda, A. subvelutina, Eucalyptus amplifolia, E. baueriana, E. benthamii, E. bosistoana, E. botryoides, E. botryoides x E. saligna, E. elata, E. grandis, E. longifolia, E. moluccana, E. ovata, E. saligna, E. tereticornis, E. viminalis*.
- patch size ≥ 0.5 ha
- groundcover comprised of ≥ 30% perennial native species
- at least ≥ 4 native species per sample plot (0.4 x 0.4 ha).

The length of Marshall Mount Creek within the action area was treated as one large patch, consistent with the EPBC Act conservation advice (DAWE 2020).

Table 3: Vegetation validation field survey dates

Date	Staff	Methodology	Hours or person days
21 October 2009	Liz Norris, Simon Tweed, Steven House	Random meander	3 person days
22 October 2009	Liz Norris, Simon Tweed	Random meander	2 person days
23 October 2009	Liz Norris, Simon Tweed	Random meaner	2 person days
31 August 2018	Alex Gorey, Dr Meredith Henderson	Validation of EPBC Act listed threatened ecological communities	16 hours
3 September 2018	Alex Gorey, Dr Meredith Henderson	Validation of EPBC Act listed threatened ecological communities	16 hours
18 September 2018	Alex Gorey, Dr Meredith Henderson	Validation of EPBC Act listed threatened ecological communities	16 hours
9 February 2021	Alex Gorey, Jake Proust	Validation of EPBC Act listed threatened ecological communities	18 hours

Threatened species habitat assessment

A terrestrial habitat assessment was conducted for the following MNES considered likely to occur across the action area:

- *Chalinolobus dwyeri* (Large-eared Pied Bat)
- *Pteropus poliocephalus* (Grey-headed Flying-fox).

The action area is in proximity to Johnson's Spur which forms a large, escarpment to the south west of the action area and was surveyed for potential rocky outcrops, cliffs, sandstone overhangs or caves that could be used as potential breeding habitat for the Large-eared Pied Bat. Survey for potential Large-eared Pied Bat breeding habitat was completed by ELA ecologists Emily Messer and Rodney Armistead on 24 January 2019 and included traversing Johnson's Spur to identify any caves, cliffs, rocky outcrops or sandstone overhangs.

An assessment of nearby known camps and potential foraging resources in the action area was completed for Grey-headed Flying-fox during the vegetation validation surveys conducted in 2009, 2018 and 2021. Any potential feed tree species were noted.

Targeted Pterostylis gibbosa survey

Survey effort for *Pterostylis gibbosa* was conducted across the entire CUDP, however the following methodology only discusses the action area.

Prior to completing targeted survey across the action area, a known population of *Pterostylis gibbosa*, approximately 3-4 km east-south-east of the action area, was visited on 10 September 2012 to confirm that the species was flowering and therefore easily detectable. This population of approximately 1,000 individuals, located in a remnant of Woollybutt-Melaleuca forest (equivalent to the EPBC Act listing of Illawarra and South Coast Lowland Forest and Woodland) on the Croom Regional Sporting Complex, is thought to be the largest of the Illawarra / Nowra populations (NPWS 2002; Alan Stephenson pers. comm.). The flowering of most terrestrial orchids is highly dependent on adequate rainfall in the preceding months and in dry seasons the plants may not flower at all. It was therefore important to verify that the autumn/winter rainfall of 2012 was sufficient to allow the Albion Park plants to flower. The site visit to Croom on 10 September 2012 found that the species was in full flower with at least 30 flowering individuals observed within a few square metres (Appendix C). The timing of the targeted survey of the action area in the following two days was therefore considered to be ideal as any individuals present at the action area would most likely have also been in full flower.

The three remnants mapped in Figure 6 (Appendix C, page 6) were all surveyed on either 10 or 11 September by Lachlan Copeland and Kimberley McCallum of Eco Logical Australia. Lachlan Copeland is an orchid expert with 15 years of experience in searching for, mapping, photographing and reporting on native orchid species. Kimberley McCallum, also an experienced field ecologist, was able to observe the plants flowering at Croom to become familiar with the species (both flowering plants and non-flowering rosettes) prior to the targeted surveys in the action area. Both ecologists walked a series of parallel transects throughout Sites 1 (stages Town Centre North / Town Centre Centre), 2 (stages 7B and 7A) and 3 (stages Town Centre South and Town Centre East) (Appendix C, Figure 6, page 6) approximately 10-15 m apart searching for suitable microhabitat (relatively bare ground with a predominantly native ground

layer). The intention was to search more thoroughly in suitable microhabitat at a sufficiently slow enough speed to find any flowering or non-flowering individuals of *Pterostylis gibbosa*. Both ecologists carried a handheld Garmin GPS with the track function activated to record and later overlay their tracks on a series of fine-scale maps.

RESULTS

Literature and data review

The literature and data review predicted the following MNES as either likely or having potential to occur across the action area:

Threatened ecological communities

- Illawarra and South Coast Lowland Forest and Woodland
- Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion
- River-flat Eucalypt Forest on Coastal Floodplains of NSW.

Threatened fauna

- *Pteropus poliocephalus* (Grey-headed Flying-fox)
- *Chalinolobus dwyeri* (Large-eared Pied Bat) (Appendix C, Figure 7, page 7).

Threatened flora

- *Pterostylis gibbosa* (Illawarra Greenhood).

Vegetation validation

The 2009 field survey identified the following mapping units across the action area (Appendix C, Figure 8 page 8):

- Riparian River Oak Forest
- Artificial Wetland
- Lowland Woollybutt Melaleuca Forest
- Weeds and Exotics.

Riparian River Oak Forest was present along the banks of Marshall Mount Creek. There were two patches of Lowland Woollybutt Melaleuca Forest to the north of Calderwood Road with scattered stretches of artificial wetland mapped along the unnamed tributaries at the northern extent of the action area. Weeds and Exotics were mapped in two patches in the north western and south eastern corners of the action area. Riparian River Oak Forest was present in moderate condition. Lowland Woollybutt – Melaleuca Forest was present in two conditions; moderate to high levels of disturbance and scattered trees (Appendix C, Figure 8 page 8, Figure 9, page 9). The artificial wetland and weeds and exotics were not assigned a condition category.

Table 4: Validated vegetation communities across the action area (ELA 2010)

ELA validated vegetation community	Impact ha (100%)	Retain (ha)	Total (ha)
Artificial Wetlands Unassessed	2.78	3.92	**6.70**
Coastal Grassy Red Gum Forest (Tx) – BC Act only	0.23	0.00	**0.23**
Fig Trees (Tx)	0.09	0.00	**0.09**
Lowland Woollybutt-Melaleuca Forest (B) – EPBC Act only	0.22	6.79	**7.00**
Lowland Woollybutt-Melaleuca Forest (TX) – BC Act only	2.02	0.92	**2.93**

ELA validated vegetation community	Impact ha (100%)	Retain (ha)	Total (ha)
Riparian River Oak Forest (C) – BC Act only	0.27	11.82	**12.09**
Weeds and Exotics Weeds and Exotics	3.64	0.91	**4.54**
Total	**9.24**	**24.35**	**33.59**

The 2018 survey to determine the presence of Illawarra and South Coast Lowland Forest and Woodland identified three patches which met the definition of the community; patches 2, 10 and 11 (Appendix C, Figure 9, page 9). An assessment of each patch meeting the definition of Illawarra and South Coast Lowland Forest and Woodland in Table 5 (Appendix A, page 21) is provided in Table 6. A 30 m buffer was applied to the edge of patch consistent with the conservation advice (Appendix C, Figure 9, page 9). A 30 m buffer was considered sufficient to minimise potential indirect impacts associated with the proposed action, such as rubbish dumping, sedimentation and erosion and temporary changes to waterflow.

The 2021 survey to determine the presence of River-flat Eucalypt Forest along Marshall Mount Creek determined that none of the previously mapped Riparian River Oak Forest met the EPBC Act definition of the community because:

- the community did not contain any *Eucalyptus* sp. and was dominated by *Casuarina cunninghamiana* subsp. *cunninghamiana*
- the groundcover contained < 10% perennial native species (determined through plot data – (Appendix E).

It was concluded that the patch of Riparian River Oak Forest does not meet the key diagnostic characteristics to be considered a patch of River-flat Eucalypt Forest consistent with the EPBC Act definition. Therefore, buffers were not applied to this community and further assessment under the EPBC Act is not required.

Threatened species habitat assessment

Field survey determined that the action area and the adjacent Johnson's Spur do not contain any potential habitat for the Large-eared Pied Bat. The Large-eared Pied Bat relies on cliffs, caves or rocky overhangs which are used for breeding in proximity to foraging resources. The action area and Johnson's Spur do not contain any landscape features that would be used as breeding habitat for the Large-eared Pied Bat. There are no other landscape features within a foraging range (2 km) of the action area that could be used as breeding habitat. However, there are nearby records for this species which suggest it may utilise the action area occasionally as a foraging resource. It was concluded that this species would utilise the action area occasionally for foraging, however no breeding habitat is present and the foraging habitat would form part of a rage of resources within the region.

Potential foraging habitat for the Grey-headed Flying-fox was identified across the action area. All patches of the following vegetation communities were considered potential habitat:

- Lowland Woollybutt Melaleuca Forest
- Riparian River Oak Forest.

No camps were identified in the action area during survey. The closest known camp is 17 km north east (Figtree) and 17 km south east at Shellharbour. The action area is considered potential habitat for the Grey-headed Flying-fox and further assessment is required, which is set out in section 2.4 of this Referral.

Targeted Pterostylis gibbosa survey

No *Pterostylis gibbosa* individuals were identified in the action area during survey. The action area is considered highly unlikely to provide habitat for this species. The results of the survey for each site are provided below.

Site 1

This remnant patch had a well-developed tree layer of *Eucalyptus longifolia* (Woollybutt) and *Melaleuca decora* (Paperbark) ranging from 8-15 m tall with an average projected foliage cover of about 50%. Beneath the tree layer were occasional shrubs of *Acacia binervata* (Two-veined Hickory), *Kunzea ambigua* (Tick Bush) and *Cassinia quinquefaria* (Dogwood) – this 2-5 m shrub layer ranged from absent in most areas to sparse in others with a cover of approximately 10%. The ground layer was relatively dense (ranging from 20-50% cover) and averaged 1-1.5 m in height.

By far the most common species was *Sida rhombifolia* (Paddy's Lucerne), an exotic forb common in heavily grazed environments. Other common weeds included *Verbena litoralis* (Purpletop) and *Rubus anglocandicans* (Blackberry). A low grass layer of *Microlaena stipoides* (Meadow Grass) and the introduced *Cenchrus clandestinus* (Kikuyu) ranged from sparse to dense throughout the site.

No plants of *Pterostylis gibbosa* or any other orchid were found in this patch. Accordingly, the species is considered highly unlikely to occur given the long history of grazing and very weedy, highly disturbed understorey. The area may well have once provided good habitat for the *Pterostylis gibbosa* in the past but is now very poor habitat given the dominance of weeds and heavy grazing.

Site 2

This remnant patch had a well-developed tree layer of Woollybutt, Paperbark, *Eucalyptus amplifolia* (Cabbage Gum) and *Eucalyptus tereticornis* (Forest Red Gum) ranging from 7-20 m tall with an average projected foliage cover of about 50%. Tall shrubs were absent although a low shrub/forb layer of Paddy's Lucerne and *Nyssanthes erecta* (Barb-wire Weed) ranged from 0.4-1 m tall and covered approximately 20% of the ground. The lower ground layer, ranging from 20-50% cover, was dominated by introduced weeds such as Kikuyu, the introduced form of *Cynodon dactylon* (Couch) and *Senecio madagascariensis* (Fireweed).

No plants of *Pterostylis gibbosa* or any other orchid were found in Site 2. Accordingly, the species is considered highly unlikely to occur given the long history of grazing and very weedy, highly disturbed understorey. The area may well have once provided good habitat for the *Pterostylis gibbosa* in the past but is now very poor habitat given the dominance of weeds and heavy grazing. The site also appeared to be grazed more recently than Site 1 to the east.

Site 3

Although mapped as a Woollybutt-Paperbark community this heavily grazed patch was in fact dominated by *Eucalyptus piperita* (Sydney Peppermint) with occasional trees of *Eucalyptus globoidea* (Stringybark) on the western edge of the remnant. The tree cover averaged about 50% while the height of the canopy ranged from 15-25 m. There was no shrub layer while the sparse ground layer was dominated by introduced weeds such as Kikuyu, Paddy's Lucerne, *Axonopus* sp. (Carpet Grass) and Fireweed. The only common native species was Meadow Grass. This remnant has been heavily grazed to the extent that little native cover remains and the ground layer is so heavily modified and degraded that there is very little chance of any orchids being present. Not surprisingly, no plants of *Pterostylis gibbosa* were recorded.

Table 5: EPBC Act condition thresholds for Illawarra and South Coast Lowland Forest and Woodland (Approved Conservation Advice DotEE 2016)

Category and rationale	Patch size thresholds	Biotic Threshold
A. High condition class. *A larger patch with good quality native understorey and / or many very large trees*	The patch is at least 2 ha	50% of its total understorey vegetation cover* is comprised of native species (exotic annuals are excluded from this assessment) **AND** At least 6 native plant species 0.5 ha in the ground layer **OR** The patch has at least 10 trees that are either; very large (at least 60 cm DBH) or have hollows
B. High condition class *A patch with very good quality native understorey with a species rich ground layer*	The patch is at least 0.5 ha	At least 70% of the understorey vegetation cover* is comprised of native species (exotic annuals are excluded from this assessment) **AND** with at least 10 native plant species per 0.5 ha in the ground layer
C. Moderate condition class *A patch with good quality native understorey*	The patch is at least 0.5 ha	At least 50% of its total understorey vegetation cover* is comprised of native species (exotic annuals are excluded from this assessment) **AND** with at least 6 native plant species per 0.5 ha in the ground layer
D. Moderate condition class *A patch that makes other important ecological contributions*	The patch is at least 0.5 ha	At least 30% of total perennial understorey vegetative cover* is comprised of native species **AND** the patch is contiguous** with another patch of native vegetation *** (at least 1 ha in area) **OR** the patch has at least one large locally indigenous tree (at least 50 cm dbh), or at least one tree with hollows

**Understorey vegetation cover includes vascular plant species of both the ground layer and the shrub layer (where present). The ground layer includes herbs (graminoids and forbs) and low (≤0.5 m) shrubs, but does not include cryptogams, leaf litter or exposed soil.*

***Contiguous with another patch of native vegetation means the patch is continuous with or in close proximity (within 100 m) to another area of native vegetation.*

****'Native vegetation' refers to areas where ≥50% of the perennial vegetation cover is comprised of native plant species.*

Table 6: Justification for patches of EPBC Act Illawarra and South Coast Lowland Forest and Woodland in the action area

Patch	Stage	Condition class	Justification
2	Town Centre	A – High condition class	• patch size in action area 3.72 ha • groundcover comprised of ≥ 70% native species • contained at least 6 native groundcover species in each 0.5 ha of the patch
10	7B	A – High condition class	• patch size in action area 4.03 ha • contained ≥ 50% native groundcover species • contained 6 native species in each 0.5 ha of the patch
11	SP1 Extension	A – high condition class	• patch size in action area 2.88 ha • contained ≥ 50% native groundcover species • contained 6 native species in each 0.5 ha of the patch

1.15 Is this action part of a staged development (or a component of a larger project)

Yes. The action area forms part of the Calderwood Urban Development Project which is approximately 700 ha in size and comprised of numerous stages, some of which have been developed. This referral has assessed stages 4, TCE, TCS, TCN, TCC, 7A, 7B, 8-12 as Mod 4 applies to them, and they are considered unlikely to constitute a significant impact to any listed MNES. The remaining stages will be re-assessed in future and reported in a separate referral, if necessary.

1.16 Is the proposed action related to other actions in the region?

Yes. Calderwood Urban Development Project was previously referred to the Commonwealth in 2010. The Commonwealth determined that the action was 'not controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.16.1 Identify the nature/scope and location of the related action (Including under the relevant legislation)

The previous EPBC Act Referral (2010/5381) assessed the potential impacts associated with the entire Calderwood Urban Development Project as approved by the Concept Plan Approval. The Concept Plan Approval approved a mix of residential, employment, retail, education, conservation and open space uses across the CUDP Site which is approximately 700ha in size. The Concept Plan Approval approved approximately 4,800 dwellings and approximately 50 ha of retail, education, community and mixed use / employment land. EPBC 2010 / 5381 was determined a Not Controlled Action and the proposed action was given approval to proceed.

2. Matters of National Environmental Significance

2.1 Is the proposed action likely to impact on the values of any World Heritage properties?

No.

2.2 Is the proposed action likely to impact on the values of any National Heritage places?

No.

2.3 Is the proposed action likely to impact on the ecological character of a Ramsar wetland?

No.

2.4 Is the proposed action likely to impact on the members of any listed threatened species (except a conservation dependant species) or any threatened ecological community, or their habitat?

No. One MNES was identified in the action area during survey; Illawarra and South Coast Lowland Forest and Woodland. The Grey-headed Flying-fox and Large-eared Pied Bat were predicted as likely to occur. The Grey-headed Flying-fox has not been identified in the action area during survey or previously recorded according to BioNet. There are several records adjacent to the action area for the Large-eared Pied Bat (BioNet 2021). Both species are predicted as likely to utilise the native vegetation in the action area as foraging habitat. No breeding habitat in the form of camps or caves, cliffs or sandstone overhangs are available within the action area.

The proposed action is considered highly unlikely to constitute a significant impact to Illawarra and South Coast Lowland Forest and Woodland, Grey-headed Flying-fox or Large-eared Pied Bat. These MNES have been assessed in detail below.

SPECIES OR THREATENED ECOLOGICAL COMMUNITY

Illawarra and South Coast Lowland and Woodland

Do you consider this impact to be significant?

No.

Illawarra and south coast lowland forest and woodland typically occurs within 30 km of the coast in coastal valleys and low-lying foothills on the south coast of NSW. In the northern part of the ecological community's range, a sharp boundary is provided by the steep slopes of the eastern coastal escarpment. The ecological community can occur below approximately 350 m above sea level (ASL), but most occurrences are at a much lower altitude; between 10 and 150 m ASL (Tozer et al, 2010). At a local scale, the ecological community varies with aspect, with more mesic elements such as rainforest understorey plants occurring (but not dominating) on more sheltered or south-facing slopes.

Along the NSW coast between Moruya and Wollongong, the community occurs on sedimentary rocks including mudstone, silt and claystone, conglomerate, sandstone, chert and some evaporites. The

ecological community occurs as a forest or woodland, with foliage cover of the main canopy greater than 10% (DotEE 2016). The canopy is typically dominated by *Eucalyptus* or *Angophora* trees. The composition of the understorey is variable and many patches have a sub-canopy of smaller trees as well as a shrub layer or a ground layer, which is grassy or sedgy. Proximity to rainforest may also increase the number of seedlings or saplings of mesic species.

Many patches have been disturbed and their current state reflects this, past clearance, with fire history and management involving grazing or under-scrubbing having a strong influence on the structural and floristic composition of the ecological community (DotEE 2016). Some patches, which would have been part of the ecological community in the past, are now so modified that they would not meet the key diagnostic characteristics or condition thresholds for the nationally protected ecological community.

The patches of the community in the action area contained a canopy of *Angophora floribunda* (Rough-barked Apple), *Melaleuca decora* (Honey Feather Myrtle), *Eucalyptus bosistoana* (Coast Grey Box) and *Eucalyptus longifolia* (Woollybutt). The midstorey was diverse and contained *Acacia maidenii* (Maiden's Wattle), *Acacia binervata* (Two-veined Hickory), *Pittosporum undulatum* (Sweet Pittosporum) and *Cassinia aculeata* (Dolly Bush). The groundcover was comprised of about 70% native species, with the most dominant *Microlaena stipoides* var. *stipoides* (Weeping Grass). Other native species present included *Dichondra repens* (Kidney Weed), *Eragrostis leptostachya* (Paddock Lovegrass), *Viola hederacea* (Ivy-leaved Violet) and *Dianella longifolia* (Blueberry Lily).

The proposed action would directly affect 0.72 ha of high condition Illawarra and South Coast Lowland Forest and Woodland with 9.86 ha retained in the action area (Appendix C, Figure 9 page 9, Figure 10, page 10). The significant impact criteria were applied with respect to this community and it was concluded that the proposed action is unlikely to constitute a significant impact on Illawarra and South Coast Lowland Forest and Woodland. No additional areas of E2 or E3 land have been proposed for clearance under the Mod 4 change.

Table 7: Application of the significant impact criteria with respect to Illawarra and South Coast Lowland Forest and Woodland

Criterion	Assessment
reduce the extent of an ecological community	The proposed action would reduce the extent of the ecological community by 0.72 ha in the action area. The area of reduction is spread across three patches. The proposed action would retain 9.86 ha of the community within the action area. The proposed action would reduce the extent of the ecological community by 6 %.
fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The areas of the community to be removed are on the edges of larger patches, which are zoned for conservation. These larger patches are already fragmented from other patches of the community due to historical clearing and grazing for agricultural purposes. The extensive parcels of agricultural land that currently fragment the three patches would limit the amount of genetic transfer between the patches. The maintenance of genetic diversity or transfer of genetic material would be limited to birds and bats. The construction of residential dwellings in place of agricultural land would not increase the existing fragmentation of the patches. Birds and bats would still be able to access all patches and assist in the maintenance of some level of genetic diversity and material transfer. Therefore, the proposed action

Criterion	Assessment
	would not fragment or increase the fragmentation of this community throughout the action area.
adversely affect habitat critical to the survival of an ecological community	Habitat critical to the survival of an ecological community is defined as areas that are necessary for the long-term maintenance of the species or ecological community, such as: • to maintain genetic diversity and long-term evolutionary development, or • for the reintroduction of populations or recovery of the species or ecological community The proposed action would remove 0.72 ha of Illawarra and South Coast Lowland Forest and Woodland on the edges of three existing patches. The areas to be affected are of the same vegetative composition and structure of the patches to be retained. There are no flora species that are unique to the areas to be affected. Given that the species to be affected are present within the retained areas, the areas for removal are not considered critical to the survival or recovery of the ecological community.
modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	The proposed action may temporarily modify the soil composition and hydrology on the edge of the patches to be retained. Changes to the composition of the soil would result from neighbouring bulk earthworks and water runoff during construction. These impacts are likely to be minimised as large portions of the development footprint are located within the 30 m buffer and do not directly affect the patch. The impacts would also be temporary and limited to the construction period. Extensive studies into the potential long-term changes in hydrology and water flow across the action area have been completed. It was concluded that, following the installation of a stormwater basin network, there would be no changes to the hydrology across the action area (Douglas Partners 2018, JWP 2019).
cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	The proposed action would remove 0.72 ha of Illawarra and South Coast Lowland Forest and Woodland on the edge of three existing patches. The areas to be affected are of the same vegetative composition and structure of the patches to be retained. There are no flora species that are unique to the areas to be affected. Ecological burns and flora / fauna harvesting are not proposed for the patches of Illawarra and South Coast Lowland Forest and Woodland that would be retained across the action area. The patches to be retained are rezoned E3 – Environmental Management, protecting the vegetation to be retained. Therefore, it is unlikely that the proposed action would result in a substantial change in species composition such that the occurrence of the community would be affected.
cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: **– assisting invasive species, that are harmful to the listed ecological community, to become established, or** **– causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit**	The proposed action would remove 0.72 ha of Illawarra and South Coast Lowland Forest and Woodland and retain 9.86 ha of the community. The area to be removed represents 6 % of the community within the action area. The 0.72 ha to be removed would be 100% affected. The 9.86 ha of the community to be retained may be affected by indirect impacts associated with the proposed action, such as weed invasion or herbicides. In some areas, portions of the 30 m buffer have been retained, or the patch borders other areas of retained land which would minimise the indirect impacts on the patch. Although the proposed action would cause a reduction in the quality of the

Criterion	Assessment
the growth of species in the ecological community, or	community, it is unlikely to be substantial, given that 94% of the community within the action area would be retained.
interfere with the recovery of an ecological community.	The proposed action is unlikely to interfere with the recovery of the ecological community given that: • the reduction in the ecological community would be limited to 6 % • the proposed action would not increase the fragmentation or isolation of the community across the action area • the proposed action would retain 94 % of the community across the action area • the proposed action is unlikely to substantially alter the composition of the community such that it would constitute a significant impact • a majority of the impact is associated with the 30 m buffer which has substantially reduced direct impacts to the community

SPECIES OR THREATENED ECOLOGICAL COMMUNITY

Pteropus poliocephalus (Grey-headed Flying-fox).

Do you consider this impact to be significant?

No.

The Grey-headed Flying-fox was not detected in the action area during targeted survey. The Grey-headed Flying-fox is typically medium to dark grey with many light-tipped hairs with fur extending to the feet. Its defining feature is an orange or russet-coloured collar which encircles the neck. This species occupies the coastal lowlands and slopes of south-eastern Australia from Bundaberg to Geelong and inland NSW to the tablelands and western slopes. The Grey-headed Flying-fox is a highly mobile, partially migratory species with a distribution that is highly varied between seasons and years. The Grey-headed Flying-fox forms part of one single, interbreeding population. The species breeds once a year between October and December (DAWE 2021.

Grey-headed Flying-foxes typically roost in camps which are used as a daytime refuge. Camps are generally stable sites, however numbers and occupation can vary over time, depending on the availability of foraging resources within the locality (DAWE 2021 2017).

This species primarily feeds on blossom and fruit in the canopy and will occasionally supplement this with leaves. This species tends to favour *Eucalyptus, Corymbia, Angophora, Melaleuca, Banksia* and *Ficus* species and will migrate in response to flowering events and the availability of food. This species will forage between 20 km and 40 km in a feeding foray from a camp site, with most distances <20 km. Up to 20 km is considered the average foraging distance and has been used in this assessment.

Threats to the Grey-headed Flying-fox include loss of foraging and roosting habitat, competition with Black Flying-foxes, negative public attitude and conflict with humans, electrocution, entanglement in netting and on barbed-wire, climate change and disease (DAWE 2021). The draft National Recovery Plan for the Grey-headed Flying-fox defines habitat critical to the survival of the species as natural habitat that is patches which (DAWE 2021):

- contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May)
- 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
- contain native and or exotic species used for roosting at the site of a nationally important Grey-Headed Flying-Fox camp as identified on the Department's interactive flying-fox web viewer.

The plan also notes that foraging resources which provide resources in times of food shortage or winter flowering species may also be critical to the survival of the species. This can include *Eucalyptus tereticornis* and *Eucalyptus pilularis* both of which were identified in the action area (DAWE 2021). Neither of the camps within a 20 km radius of the action area (Figtree or Shellharbour) are Nationally Important Camps, as neither have:

- contained ≥ 10,000 individuals in more than one year for the past ten years OR
- have been occupied by more than 2,500 Grey-headed Flying-foxes permanently or seasonally every year for the last 10 years (DAWE 2021).

The action area contains 26.13 ha of potential habitat for this species, with 3.73 ha to be affected and 22.40 ha to be retained (Appendix C, Figure 11, page 11). There is an additional 68,955 ha of potential foraging habitat within a 20 km radius of the site, 20,684 ha of which is within either National Parks or State Forests. No camps were identified in the action area during survey. There are 688 records for this species within a 20 km radius of the action area (Appendix C, Figure 12, page 12). Camps within a 20 km radius of the action area include:

- Figtree – last recorded 500 – 2,499 bats
- Shellharbour – last recorded 500 – 2,499 bats (DAWE 2021).

The significant impact criteria was applied with respect to the Grey-headed Flying-fox and it was concluded that the proposed action would not constitute a significant impact to this species (Appendix A, Table 8, page 28). There are no additional areas of native vegetation to be removed that would be potential foraging habitat for Grey-headed Flying-fox.

Table 8: Application of the significant impact criteria with respect to the Grey-headed Flying-fox

Criterion	Assessment
lead to a long-term decrease in the size of an important population of a species	The Grey-headed Flying-fox is comprised of one large interbreeding population (DAWE 2021). The presence of any individuals of this species signals that an important population is present. The proposed action would result in the removal of 3.73 ha of potential foraging habitat for the Grey-headed Flying-fox, with 22.40 ha to be retained across the action area. No known camps would be affected. The potential foraging habitat to be removed is considered marginal and would form part of a mosaic of foraging resources. When the canopy is not in flower, other foraging resources throughout the region would be utilised. Given the low density of canopy species in the development footprint it is unlikely to produce enough nectar to singularly sustain individuals foraging within the locality. The Grey-headed Flying-fox is highly mobile and has a large home range travelling long distances on feeding foray (up to 20 km from camps (DAWE 2021)). The Grey-headed Flying-fox would use the action area on an occasional basis and would not depend on these foraging resources. As such, the proposed action is unlikely to lead to a long-term decrease in the size of an important population of the Grey-headed Flying-fox.
reduce the area of occupancy of an important population	The Grey-headed Flying-fox is comprised of one large interbreeding population. The presence of any individuals of this species signals that an important population is present. The proposed action would remove 3.73 ha of potential foraging habitat for the Grey-headed Flying-fox. No known camps would be affected. The removal of 3.73 ha of potential foraging habitat would reduce the area of occupancy of the Grey-headed Flying-fox, however the impact is unlikely to be significant. The foraging habitat to be removed could form a critical foraging resource for the Grey-headed Flying-fox due to the presence of *Eucalyptus tereticornis* and *Eucalyptus pilularis*. About 22.40 ha of potential foraging habitat would be retained within the action area and 68,955 ha of additional habitat is available within a 20 km radius of the site, of which 20,684 ha is secured as part of National Parks or State Forests. The Grey-headed Flying-fox is highly mobile and will utilise a range of foraging resources within the region. Therefore, although the removal of 3.73 ha of potential foraging habitat would reduce the area of occupancy of the species it is not considered to be significant.
fragment an existing important population into two or more populations	The Grey-headed Flying-fox is comprised of one large interbreeding population. The presence of any individuals of this species signals that an important population is present. The proposed action would result in the removal of 3.73 ha of potential foraging habitat for the Grey-headed Flying-fox. No known camps would be affected.

Criterion	Assessment
	The area of habitat that would be affected as part of the proposed action exist on the edge of larger patches throughout the action area. The proposed action would not fragment an existing native vegetation into two or more, as the patches are already fragmented as a result of extensive clearing for agricultural purposes. The proposed action would increase the fragmentation marginally, however this is highly unlikely to affect the Grey-headed Flying-fox given their highly mobile nature. Further, the proposed action would not remove foraging habitat such that no habitat is available between two or more camps. As such, the proposed action would not fragment an existing population into two or more.
adversely affect habitat critical to the survival of a species	For the Grey-headed Flying-fox, critical habitat is defined as • contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May) • 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 • contain native and or exotic species used for roosting at the site of a nationally important Grey-Headed Flying-Fox camp as identified on the Department's interactive flying-fox web viewer. The action area is located 17 km south-west of the Figtree camp and 10 km north west of the Shellharbour camp. The Figtree camp has not contained more than 30,000 individuals since monitoring began. There are also no camps within 20 km of the site currently supporting more than 30,000 individuals (DAWE 2021). Therefore, the action area does not form critical habitat for this species. The proposed action would not adversely affect habitat critical to the survival of this species.
disrupt the breeding cycle of an important population	No roosting habitat would be removed or disturbed for the Grey-headed Flying-fox. The removal of 3.73 ha of marginal foraging habitat would be unlikely to disrupt the foraging behaviour of any individuals such that the breeding cycle of the Grey-headed Flying-fox would be disrupted.
modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action will not modify or isolate the availability or quality of habitat to the extent that the Grey-headed Flying-fox is likely to decline. The proposed action would decrease the availability of foraging habitat within this species range, however it is unlikely to be at such an extent that the Grey-headed Flying-fox would decline. The foraging habitat in the action area is considered marginal for the Grey-headed Flying-fox. The foraging habitat is not directly contiguous with known camps this species and would be unlikely to form a primary foraging source for young. Given the large foraging ranges of these species, the action area would likely form a mosaic of foraging resources and would be relied upon only occasionally by this species. Thus, the proposed action is unlikely to 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	The major threats to the Grey-headed Flying-fox are related to vegetation clearance, camp disturbance, mortality in commercial fruit crops, heat stress, entanglement, climate change, bushfire, conflict with humans and electrocution. These threats are not associated with the increased presence of an invasive species. The proposed action is unlikely to result in invasive species becoming established in the Grey-headed Flying-fox habitat.
introduce disease that may cause the species to decline, or	The Grey-headed Flying-fox is susceptible to the Lyssavirus. Increases of the Lyssavirus typically occurs when a population is undergoing stress. The action area would provide marginal foraging habitat that would make up a mosaic of resources that would be utilised in the region. The action area would not provide the primary foraging resource, nor does the action area

Criterion	Assessment
	contain known camps for this species. The removal of 3.73 ha of marginal foraging habitat is unlikely to cause a level of distress such that the Grey-headed Flying-fox is likely to decline.
interfere substantially with the recovery of the species.	The recovery of both the Grey-headed Flying-fox require identifying important camps and foraging habitat used around camps. As discussed above, there are no camps critical to the survival of the Grey-headed Flying-fox within a 20 km radius of the action area. The proposed action is unlikely to interfere with the recovery of the species given: • no camps would be affected • the proposed action would remove 3.73 ha of marginal habitat on the edge of larger patches • the proposed action would not fragment or isolate any areas of foraging habitat or foraging habitat from a camp • the species is highly mobile and forages widely. Thus, the proposed action would be unlikely to interfere with the recovery of this species.

SPECIES OR THREATENED ECOLOGICAL COMMUNITY

Chalinolobus dwyeri (Large-eared Pied Bat)

Do you consider this impact to be significant?

No.

The Large-eared Pied Bat has been previously recorded immediately adjacent to the southern boundary of the action area. The Large-eared Pied Bat is a medium-sized insectivorous bat measuring approximately 100mm including the head and tail. Much of the information on the ecology of the large-eared pied bat comes from studies of the population at the type locality at Copeton, NSW during the early 1960s (Dwyer 1966). Over most of its range, the large-eared pied bat appears to roost predominantly in caves and overhangs in sandstone cliffs and forage in nearby high-fertility forest or woodland near watercourses (DERM 2011).

The large-eared pied bat is known from Shoalwater Bay, north of Rockhampton, Qld, south to the vicinity of Ulladulla in NSW. In Shoalwater Bay it is known from a single individual, and the size and number of populations in this area is unknown. Further records are known in Qld from sandstone escarpments in the Carnarvon and Expedition Ranges and Blackdown Tablelands. It is likely that these areas support a high proportion of the Qld populations of this bat, although estimates of the number of individuals present and their distribution in these areas has not been established. Additional records exist in the Scenic Rim near the NSW/Qld border. Given their location in the geological landscape, the populations in this area appear to be reliant on the presence of roosts in volcanic rock types (DERM 2011).

The most recent record from this area was an adult female captured adjacent to rhyolite cliffs at Springbrook in August 2004 (DERM 2011). Much of the known distribution of the large-eared pied bat occurs in NSW. In the north east of the state at Coolah Tops, Mt Kaputar and Warrumbungle National Park it is present in areas of volcanic strata. It is more widely distributed, but still uncommon and patchy within its distribution, in the sandstone areas of the Sydney Basin and the western slopes.

Sandstone cliffs and fertile wooded valley habitat within close proximity of each other should be considered habitat critical to the survival of the large-eared pied bat. The action area does not contain any critical habitat given the absence or nearby presence of potential breeding habitat in the form of sandstone cliffs or caves. However, the presence of nearby records suggests that the action area could be used for foraging purposes on an occasional basis.

Important populations are considered those that occur in areas dominated by sandstone escarpments, which within NSW is limited to the Sydney basin and North West slopes. The action area does not contain any sandstone escarpments and therefore, does not form part of critical habitat.

The action area contains 22.33 ha of potential habitat for this species, with 3.73 ha to be affected and 22.40 ha to be retained (Appendix C, Figure 13, page 13). There is an additional 68,955 ha of potential foraging habitat within a 20 km radius of the site, 20,684 ha of which is within either National Parks or State Forests, of which there are previous records for the species which suggests that individuals would utilise these areas. There are 17 records for this species within a 20 km radius of the action area (Appendix C, Figure 14, page 14). No potential breeding sites were identified in the action area during survey.

Criterion	Assessment
lead to a long-term decrease in the size of an important population of a species	Important populations are considered those that occur in areas dominated by sandstone escarpments, which within NSW is limited to the Sydney basin and North West slopes. The action area does not contain any sandstone escarpments and therefore, does not form part of critical habitat. The proposed action would result in the removal of 3.73 ha of potential foraging habitat for the Large-eared Pied Bat, with 22.40 ha to be retained across the action area. No known breeding habitat would be affected. The potential foraging habitat to be removed is considered marginal and would form part of a mosaic of foraging resources. It is unlikely that the native vegetation in the action area is sufficient to sustain all locally foraging individuals. The Large-eared Pied Bat is mobile and has a home range of several kilometres from its breeding site (DERM 2011). The Large-eared Pied Bat would use the action area on an occasional basis and would not depend on these foraging resources. As such, the proposed action is unlikely to lead to a long-term decrease in the size of an important population of the Large-eared Pied Bat.
reduce the area of occupancy of an important population	Important populations are considered those that occur in areas dominated by sandstone escarpments, which within NSW is limited to the Sydney basin and North West slopes. The action area does not contain any sandstone escarpments and therefore, does not form part of critical habitat. The proposed action would result in the removal of 3.73 ha of potential foraging habitat for the Large-eared Pied Bat, with 22.40 ha to be retained across the action area. No known breeding habitat would be affected. The removal of 3.73 ha of potential foraging habitat would reduce the area of occupancy of the Large-eared Pied Bat, however the impact is unlikely to be significant. The foraging habitat to be removed does not form critical habitat for this species. About 22.40 ha of potential foraging habitat would be retained within the action area and 68,955 ha of additional habitat is available within a 20 km radius of the site, of which 20,684 ha is secured as part of National Parks or State Forests and could be within proximity of sandstone escarpments (note, this has not been field validated). The Large-eared Pied Bat is mobile and will utilise a range of foraging resources within the region. Therefore, although the removal of 3.73 ha of potential foraging habitat would reduce the area of occupancy of the species it is not considered to be significant.
fragment an existing important population into two or more populations	Important populations are considered those that occur in areas dominated by sandstone escarpments, which within NSW is limited to the Sydney basin and North West slopes. The action area does not contain any sandstone escarpments and therefore, does not form part of critical habitat. The proposed action would result in the removal of 3.73 ha of potential foraging habitat for the Large-eared Pied Bat, with 22.40 ha to be retained across the action area. No known breeding habitat would be affected. The area of habitat that would be affected as part of the proposed action exist on the edge of larger patches throughout the action area. The proposed action would not fragment an existing native vegetation into two or more, as the patches are already fragmented as a result of extensive clearing for agricultural purposes. The proposed action would increase the fragmentation marginally, however this is highly unlikely to affect the Large-eared Pied Bat given their mobile nature. Further, the proposed action would not remove foraging habitat such that no habitat is available between or within proximity to breeding areas. As such, the proposed action would not fragment an existing population into two or more.

Criterion	Assessment
adversely affect habitat critical to the survival of a species	Sandstone cliffs and fertile wooded valley habitat within close proximity of each other should be considered habitat critical to the survival of the Large-eared Pied Bat. The action area does not contain any critical habitat given the absence or nearby presence of potential breeding habitat in the form of sandstone cliffs or caves. However, the presence of nearby records suggests that the action area could be used for foraging purposes on an occasional basis. The proposed action would not adversely affect habitat critical to the survival of this species.
disrupt the breeding cycle of an important population	No roosting habitat would be removed or disturbed for the Large-eared Pied Bat. The removal of 3.73 ha of marginal foraging habitat would be unlikely to disrupt the foraging behaviour of any individuals such that the breeding cycle of the Large-eared Pied Bat would be disrupted.
modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action will not modify or isolate the availability or quality of habitat to the extent that the Large-eared Pied Bat is likely to decline. The proposed action would decrease the availability of foraging habitat within this species range, however it is unlikely to be at such an extent that the Large-eared Pied Bat would decline. The foraging habitat in the action area is considered marginal for the Large-eared Pied Bat, as it is not continuous with known breeding habitat and would be unlikely to form a primary foraging source. Given the foraging ranges of this species, the action area would likely form a mosaic of foraging resources and would be relied upon only occasionally by this species. Thus, the proposed action is unlikely to decrease the availability or quality of habitat to the extent that the Large-eared Pied Bat is likely to decline.
result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The major threats to the Large-eared Pied Bat include: • Destruction of and interference with maternity and other roosts • Mining of roosts • Mine subsidence of cliff lines • Disturbance from human recreational activities • Habitat disturbance by livestock and feral animals • Predation by introduced predators • Vegetation clearance in proximity of roosts • Fire in proximity of roosts • Loss of genetic diversity These threats are not associated with the increased presence of an invasive species. The proposed action is unlikely to result in invasive species becoming established in the Large-eared Pied Bat habitat.
introduce disease that may cause the species to decline, or	There are no diseases listed in the Recovery Plan for the Large-eared Pied bat.
interfere substantially with the recovery of the species.	The recovery of the Large-eared Pied Bat requires mapping known colonies, roost structures and completing targeted survey to produce a revised distribution and habitat model. As discussed above, there are no known breeding areas in proximity of the action area. The proposed action is unlikely to interfere with the recovery of the species given: • no known breeding areas would be affected • the proposed action would remove 3.73 ha of marginal habitat on the edge of larger patches • the proposed action would not fragment or isolate any areas of foraging habitat or foraging habitat from a camp • the species is mobile and forages widely. Thus, the proposed action would be unlikely to interfere with the recovery of this species.

2.5 Is the proposed action likely to impact on the member of any listed migratory species, or their habitat?

No.

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

No.

2.7 Is the proposed action likely to impact on any part of the environment in the Commonwealth land?

No.

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

No.

2.9 Will there be any impact on a water resource related to coal / gas / mining?

No.

2.10 Is the proposed action a nuclear action?

No.

2.11 Is the proposed action to be taken by the Commonwealth agency?

No.

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?

No.

2.13 Is the proposed action likely to impact on any part of the environment in the Commonwealth marine area?

No.

2.14 Upload any technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral

For upload into the portal.

3. Description of the Project

3.1 Describe the flora and fauna relevant to the project area.

The action area is divided by Marshall Mount Creek which runs across the action area from east to west. The riparian zone around Marshall Mount Creek contains native vegetation in poor condition. The remainder of the action area contains scattered patches of native vegetation amongst agricultural lands which are comprised of exotic pasture grasses. No threatened flora or fauna species have been observed during the numerous surveys conducted on action area (Section 1.14). The Grey-headed Flying-fox was predicted as likely to occur in the action area.

3.2 Describe the hydrology relevant to the project area (including water flows)

Marshall Mount Creek flows in an easterly direction through the centre of the action area, eventually linking into the Macquarie Rivulet to the east of the action area. The whole of the site is contained within the drainage catchment of the Macquarie Rivulet.

3.3 Describe the soil and vegetation characteristics relevant to the project

The action area is underlain by Quaternary sediments on the floodplains which include:

- Shale based soils in the lower lying areas generally south of Marshall Mount Creek
- Sedimentary strata of the Berry Formation on the foot slopes
- An outcrop of volcanics of Cambewarra latites at the highest point of the study area around Mount Johnston.

There is also an area underlain by Budgong sandstone at the northern boundary of the study area towards Marshall Mount.

3.4 Describe any outstanding natural features and / or any other important or unique values relevant to the project area

The action area is bound by residential development to the south and predominantly vegetated rural residential land to the north, east and west. The action area is dominated by exotic pasture grasses and contains limited remnant native vegetation, which now exists as small, fragmented patches.

3.5 Describe the status of native vegetation relevant to the project

Previous assessment by ELA identified the following EPBC Act listed vegetation community in the action area:

- Illawarra and South Coast Lowland Forest and Woodland (comprised of Lowland Woollybutt-Melaleuca Forest - Appendix C, Figure 8, page 8, Figure 9, page 9).

The action area also contained three vegetation communities that are either not listed under the EPBC Act or did not meet the EPBC Act definition of a community (Appendix C, Figure 8, page 8):

- Riparian River Oak Forest (did not meet the definition of River-flat eucalypt forest on coastal floodplains)

- Artificial wetlands (not listed under the EPBC Act)
- Weeds and exotics (not listed under the EPBC Act).

A majority of the vegetation across the action area was in poor condition and highly fragmented with high levels of weed invasion most likely associated with the previous use of the land for agricultural purposes. The three patches of Illawarra and South Coast Lowland Forest and Woodland were in moderate – good condition with a lower level of weed invasion.

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area

The site is relatively flat, with low hills on the western extent of the action area, toward Johnson's Spur.

3.7 Describe the current condition of the environment relevant to the project area

The site has a long history of disturbance associated with agricultural land uses including cattle grazing. A majority of the native vegetation has been cleared for agricultural purposes which has left small, fragmented patches of vegetation across the action area. The riparian corridors are also highly disturbed with smaller tributaries lacking any remnant native vegetation. Where remnant native vegetation is present, this is a high level of weed invasion in the midstorey layer.

3.8 Describe any Commonwealth Heritage Places or other places recognised as having heritage values relevant to the project area

The action area does not contain any Commonwealth Heritage Places or other places recognised as having heritage significance.

3.9 Describe any indigenous heritage values relevant to the project area

The proposed action has potential to impact 10 Aboriginal archaeological sites. The sites and associated development footprint will require AHIPs per stage prior to any impact to Aboriginal objects. Details of each of the 10 sites are shown in Appendix F.

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area

The land is freehold and controlled by Lendlease Communities (Calderwood) Pty Ltd.

3.11 Describe any existing or proposed uses relevant to the project area

The action area is currently used as agricultural land and in some areas, low density rural residential. The action area will be comprised of residential dwellings, associated infrastructure, open space and E3 environmental lands and commercial infrastructure. The action area will no longer be used as agricultural land.

4. Section 4 – Measures to avoid or reduce impact from your proposed action

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action

The proposed action has considered the existing native vegetation and other ecological values, including riparian corridors that are present within the action area. The development footprint and retention areas were proposed in the Concept Plan which covered the entire CUDP. The aim of the Concept Plan was to take a strategic approach to the development footprint across the entire subdivision. As a result, within the action area, the development footprint has retained the three patches of EPBC Act Illawarra and South Coast Lowland Forest and Woodland, Marshall Mount Creek and its tributaries (Appendix C, Figure 15, page 15). Through the design process, the development footprint has avoided 9.86 ha of Illawarra and South Coast Lowland Forest and Woodland. Where impacts to this community could not be avoided, impacts were concentrated on the edges of existing patches to avoid fragmentation (Appendix A, Table 9, page 37).

The proposed action has also concentrated impacts where the vegetation is in poor condition and does not comprise potential foraging habitat for the Grey-headed Flying-fox.

Table 9: EPBC Act listed vegetation communities to be affected and retained in the action area

Vegetation community	EPBC Act listing	Impact (ha)	Retain (ha)	Total
Illawarra and South Coast Lowland Forest and Woodland	CE	0.72	9.86	10.58
Total		**0.72**	**9.86**	**10.58**

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes

Retention of native vegetation

The Concept Plan provides for retention of the core ecological values of the site including Marshall Mount Creek and the patches of Illawarra and South Coast Lowland Forest and Woodland. This has minimised the potential impacts to some MNES.

Overall, approximately 93.3 % of all native vegetation will be retained in the action area as part of the E3 – Environmental Management or E2 -Environmental Conservation lands. Some 94 % of the good condition Illawarra and South Coast Lowland Forest and Woodland is proposed for retention, with the development footprint concentrated on previously cleared agricultural land.

Protection through zoning and the ESL layer

The proponent proposes to protect the retained Illawarra and South Coast Lowland Forest and Woodland and other retained native vegetation in the action area via the approved conservation zoning and an Environmentally Significant Lands (ESL) layer which will serve as an additional consent requirement for any future works proposed. The ESL has been placed over the patches of Illawarra and

South Coast Lowland Forest and Woodland and the riparian corridors in the action area. These areas are zoned E2 – Environmental Conservation or E3 – Environmental Management. The specific controls relating to development on or adjacent to ESL are (JBA Urban Planning Consultants 2011):

Before granting consent, the consent authority must be satisfied that the development:

- *would substantially retain existing native vegetation, and*
- *would not adversely affect to a significant extent:*
  - *the ecological value of the existing vegetation, or*
  - *native fauna*
  - Before granting consent, the consent authority must consider whether*;*
- *the locality has high biological diversity*
- *the locality contains:*
  - *a disjunct population of native species or a species that is neat the limit of its geographical range, or - riparian vegetation, or*
  - *vegetation associated with wetlands, and*
- *the land has connective importance as, or as part of*
  - *a corridor of native vegetation forming a connection that allows for the potential passage of species of flora or fauna between two or more areas of native vegetation, and*
- *the vegetation is adequately represented on land in the general locality, and*
- *the land is important as a site along a migratory route for wildlife, and*
- *the land functions as an important drought refuge for wildlife, and*
- *clearing of the land would be likely to contribute significantly to:*
  - *soil erosion, or*
  - *salinisation of soil or water, or*
  - *acidification of soil, or*
  - *landslip, or*
  - *deterioration in the quality of surface or ground water, or - increased flooding, or*
- *there is any need to conserve all or some of the native vegetation because:*
  - *of its unusually good condition or its significance as a sample of its type, or*
  - *the development will increase the perimeter of the native vegetation, and so the ratio of the boundary to the area of the native vegetation, making it more vulnerable to negative impacts, or*
  - *there is an archaeological site that has Aboriginal heritage significance on the land.*

Ongoing public ownership of conservation areas

Lendlease Calderwood's proposed ongoing ownership plan for the site is to handover all E2, E3, SP2 and RE1 (Public Recreation) zoned lands to the relevant Council (as appropriate). The proponent will rehabilitate these areas to a suitable condition prior to handover. The details of this rehabilitation have been contained in a Statement of Commitments. Ownership by a public authority will provide ongoing protection of key areas of existing native vegetation across the action area. Mechanisms to ensure this occurs are subject to ongoing negotiation with Wollongong and Shellharbour Local Councils.

Vegetation Management Plans

The Statement of Commitments that were issued with the approval of the 2010 Concept Plan for the entire CUDP included commitments for the preparation of Vegetation Management Plans (VMPs) for all open space corridors, environmental reserves and 'citywide bushland' across the CUDP (Statement of Commitment 35, Appendix G). Within the action area, VMPs must be prepared for all three patches of Illawarra and South Coast Lowland Forest and Woodland, Marshall Mount Creek and its tributaries.

5. Section 5 – Conclusion on the likelihood of significant impacts

5.1.1 World Heritage Places
No.

5.1.2 National Heritage Places
No.

5.1.3 Wetlands on International Importance (declared Ramsar Wetlands)
No.

5.1.4 Listed threatened species or any threatened ecological community
No.

5.1.5 Listed migratory species
No.

5.1.6 Commonwealth marine environment
No.

5.1.7 Protection of the environment from actions involving Commonwealth land
No.

5.1.8 Great Barrier Reef Marine Park
No.

5.1.9 A water resource, in relation to coal/gas/mining
No.

5.1.10 Protection of the environment from nuclear actions
No.

5.1.11 Protection of the environment from Commonwealth actions
No.

5.1.12 Commonwealth Heritage places overseas
No.

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action

The proposed action is considered not a controlled action. No significant impacts on MNES are expected to occur for the reasons documented in section 2.4. A significant impact is considered unlikely to occur because:

- 0.72 ha of Illawarra and South Coast Lowland Forest and Woodland would be affected which forms 6% of the community across the referral area, with 9.86 ha to be retained.
- Impacts to Illawarra and South Coast Lowland Forest and Woodland would not result in the fragmentation or isolation of any existing patches of the community
- 94% of the community across the action area will be retained
- Impacts to Grey-headed Flying-fox and Large-eared Pied Bat are unlikely to be significant as no breeding habitat in the form of camps, or caves, cliffs or karsts would be affected
- 3.73 ha of potential foraging habitat for the Grey-headed Flying-fox and the Large-eared Pied Bat would be affected, with 22.40 ha to be retained in the action area. This is negligible, given the species' large foraging range.

6. Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Please explain in further detail

The person proposing to take the action is Lendlease Communities (Calderwood) Pty Ltd (**Lendlease Calderwood**). There have not been any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against Lendlease Calderwood. Lendlease Calderwood considers it has a satisfactory environmental record and it is an appropriate approval holder.

For completeness Lendlease Calderwood has disclosed one incident associated with the Lendlease Communities (Calderwood) project. The incident occurred in 2017 and involved a previous services contractor placing a gravel track and compound through an area which was required to be managed as land zoned E3 Environmental Management for environmental protection and through an area of Indigenous heritage. Lendlease Calderwood notified the relevant NSW authority at the time being the Office of Environment and Heritage (Now DPIE). ELA has been advised by Lendlease Calderwood that no proceedings were commenced and that no regulatory or enforcement action was taken in response to the incident.

To provide an accurate and fulsome response, another subsidiary of Lendlease Corporation Limited, Lendlease Communities (Wilton) Pty Ltd (**Lendlease Wilton**) the proponent and approval holder pursuant to the EPBC Act (EPBC Approval 2014/7400) for the project at Bingara Gorge has reported two potential non-compliances to the Department consistent with the requirements outlined in the conditions of approval. On 12 August 2020, the Department issued a warning for the first possible non-compliance. To the best of ELA's knowledge, Lendlease Wilton has committed to remedial actions in relation to the first possible non-compliance. Replanting of affected native vegetation has been implemented. Lendlease Wilton is continuing to liaise with the Department regarding the possible second non-compliance.

6.2 Provide details of any proceeding under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources

To the best of ELA's knowledge, there have been no proceedings under Commonwealth, State or Territory law against Lendlease Calderwood for the protection of the environment or the conservation and sustainable use of natural resources.

6.3 Will the action be taken in accordance with the corporation's environmental policy and planning framework?

Yes.

6.3.1 If the person taking the action is a corporation, please provide details of the corporation's environmental policy and planning framework

The person proposing to take the action is Lendlease Calderwood. Lendlease Calderwood is a subsidiary of Lendlease Corporation Limited (**Lendlease Corporation**).

Lendlease Corporation's vision is to be the lead agency for practical demonstration of sustainable development. The company's Sustainability Framework includes a number of strategies, processes and procedures such as:

- a system for tracking and measuring corporate performance;
- a strategy of innovation;
- a system for the sustainability assessment of projects;
- a project design review process;
- a process for visioning and objective setting;
- providing guidelines for purchasers to achieve sustainable design outcomes; and
- sustainable development policies.

The action proposed by Lendlease Calderwood will be governed by all of the above. Lendlease Corporation's environmental policy seeks to minimise its environmental impact, control waste, prevent pollution, use resources effectively and act with consideration for its neighbours.

Additionally, Lendlease Corporation identifies compliance with legislation as a minimum goal and will apply global best practice and innovations where legislation does not exist. Lendlease Corporation implements management systems, sets goals and measures targets against clear objectives. These are regularly reviewed. Lendlease Corporation also provides specific training to staff to ensure a thorough understanding of its commitment to the environment.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

Yes. Lendlease Calderwood has previously referred the following under the EPBC Act:

- 2010/5381 Delfin Lend Lease Limited - Residential development - Calderwood Valley

For completeness, we also note the following referrals were made by other Lendlease related entities under the EPBC Act:

- 2001/520 Lend Lease Development Pty Ltd - Urban development - Pine Rivers
- 2004/1907 Lend Lease Development Pty Ltd – Tourism - North Shore Coastal Village
- 2004/1921 Delfin Lend Lease - Urban and commercial - Caroline Springs
- 2004/1925 Lend Lease Development Pty Ltd - Urban and commercial new development – St Patrick's Estate
- 2005/1935 Delfin Lend Lease - Residential Development - Caroline Springs
- 2005/1936 Delfin Lend Lease - Transport - Caroline Springs

- 2007/3574 Delfin Lend Lease - Commercial Development Rocky Springs
- 2007/3574 Lendlease – Residential and Commercial Development, Rocky Springs (QLD)
- 2011/5826 Delfin Lend Lease - Residential Development - Gawler East
- 2011/5902 Lend Lease - Residential Development - Lot 1004 Alkimos WA
- 2013/6791 Lend Lease Communities Yarrabilba Pty Limited - Residential Development - Yarrabilba
- 2013/6818 Lend Lease Communities (Redbank Plains) Pty Ltd - Residential development - Redbank Plains
- 2013/6828 Lend Lease Communities (Woodlands) Pty Limited - Residential development - Woodlands Residential development
- 2013/7057 Lend Lease Communities Springfield Pty Ltd - Residential Development - Spring Mountain
- 2014/7400 Lend Lease Communities Australia Limited - Residential Development - Bingara Gorge
- 2015/7534 Lend Lease Communities (Townsville) Pty Ltd/Transport - land/Bruce Hway, Julago/QLD/Construction of a western access road, Julago, Qld 4/08/2015 Completed Referral Decision Made
- 2015/7561 Lend Lease Corporation Limited/Commercial Development/Marmion Ave, Alkimos/Western Australia/Alkimos city centre and central development, WA 7/10/2015 Post-Approval Approval Decision Made
- 2015/7599 Lendlease Communities (Gilead) – Residential development – Mt Gilead Residential development
- 2016/7830 Lendlease Communities (Gilead) – Residential development – Mt Gilead Residential development
- 2016/7849 Lendlease Building Contractors Pty Ltd – Commercial development – Adelaide Festival Plaza Precinct
- 2017/7875 Lendlease Communities (Springfield) – Residential Development – Woogaroo Heights
- 2018/8359 Lendlease Communities (Pine Valley) – Residential Development – Morayfield
- 2019/8436 Lendlease Communities (Townsville) – Residential Development – Elliot Springs Estate
- 2019/8552 Lendlease – Residential Development, Werrington (NSW)
- 2019/8587 Lendlease Communities (Figtree Hill) – Residential Development – Mt Gilead Stage 2 Residential Development
- 2020/8849 – Lendlease Communities (Shoreline) – Waste Management – Bayhill Estate
- 2020/8863 Lendlease Communities (Shoreline)– Residential Development, Bayhill Estate

7. Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

7.1 List references used in preparing the referral (please provide the reference source reliability and any uncertainties of source).

All of the references used in preparing this referral are considered to be of a high reliability and from a reliable source as most have been prepared by either the Australian or NSW Government. The resources used comprise listing information, impact assessment guidelines and/or recovery plans for MNES.

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DAWE 2020b. Interactive Flying Fox Web Viewer. Available at http://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jsfDepartment of Environment (DoE) 2016. *National Recovery Plan for the Spot-tailed Quoll Dasyurus maculatus*. Available at http://www.environment.gov.au/system/files/resources/2343110b-d2b4-4a1f-b66e-ddfae63c4aa6/files/national-recovery-plan-spotted-tailed-quoll.pdf

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JBA Urban Planning Consultants 2011. Calderwood Urban Development Project, consolidated concept plan.

NS National Parks and Wildlife Service 2002. Native Vegetation of the Illawarra Escarpment and Coastal Plain. Last accessed 2010. Available at https://data.nsw.gov.au/data/dataset/oeh-native-vegetation-of-the-illawarra-escarpment-and-coastal-plain-2014-vis_id-377850675

8. Proposed alternatives

8.1 Provide a description of the feasible alternative

No alternative has been considered for the proposed action.

8.2 Select the relevant alternatives related to your proposed action

N/A

8.3 Do you have another alternative?

N/A

9. Section 9 – Contacts, signatures and declarations

Proponent information/signatures required

9.1 Is the person proposing to take the action an Organisation or an individual?

Organisation

9.2 Organisation-

9.2.1 Job Title

Senior Development Manager

9.2.2 First Name

George

9.2.3 Last Name

Popovic

9.2.4 E-mail

george.popovic@lendlease.com

9.2.5 Postal Address

Level 2, 88 Philip Street Parramatta NSW 2150

9.2.6 ABN/ACN

53 079 989 674

9.2.7 Organisation Telephone

0417723720

9.2.8 I qualify for exemption from fees under section 520(4c)(e)(v) of the EPBC Act because I am:

not applicable.

9.3 Is the proposed designated proponent an organisation or individual?

9.4 Organisation-

9.4.1 Job Title

Senior Development Manager

9.4.2 First Name

George

9.4.3 Last Name

Popovic

9.4.4 E-mail
George.popovic@lendlease.com

9.4.5 Postal Address
Level 2, 88 Philip Street Parramatta NSW 2150

9.4.6 ABN/ACN
53 079 989 674

9.4.7 Organisation Telephone
0417723720

9.5 Is the referring party an organisation or individual?
Organisation

9.6 Individual
Not applicable.

9.7 Organisation
Eco Logical Australia Pty Ltd

9.7.1 Job title
Ecologist

9.7.2 First name
Alex

9.7.3 Last name
Gorey

9.7.4 Email
alexg@ecoaus.com.au

9.7.5 Postal address
Level 3, 101 Sussex Street, Sydney NSW 2000.

PO Box Q108. Sydney NSW 1230

9.7.6 ABN / CAN
87 096 512 088

9.7.7 Organisation telephone
9259 3773

9.7.8 Organisation E-mail
alexg@ecoaus.com.au

Appendix A EPBC Act referral supporting documentation (ELA 2021)

This document is Appendix A.

Appendix B Likelihood of occurrence

Provided as a separate document.

Appendix C Figures

Provided as a separate document.

Appendix D Targeted survey of Pterostylis gibbosa (Illawarra Greenhood) for the Calderwood Urban Development Project (ELA 2012)

Provided as a separate document

Appendix E ELA 2021 plot data

Provided as a separate document.

Appendix F Aboriginal Heritage Assessment (Kelleher Nightingale Consulting Pty Ltd 2018)

Provided as a separate document

Appendix G Calderwood Urban Development Project Statement of Commitments

Provided as a separate document.

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