environmental management

saunders havill group

107-109 Kremzow Road, Warner
EPBC Act Referral

Boral CSR Bricks Pty Ltd

21 June 2016
8012

surveying town planning urban design environmental management landscape architecture

Referral of proposed action

Project title: Kremzow Road Quarry Expansion

1 Summary of proposed action

1.1 **Short description**

The proposed action involves the extension of an existing quarry in the suburb of Warner, approximately 18 km north west of Brisbane City, Queensland. This referral pertains to a proposed extension of a development footprint of 18.2 ha, which will form the entire quarry extent. This development includes the clearing of approximately 16.5 ha of vegetation on property zoned as Extractive Industry under the Moreton Bay Regional Council. The extension of the existing quarry will allow for continued operations at the site without the requirement of new ancillary infrastructure.

1.2 **Latitude and longitude**

Id	Longitude	Latitude
1	152.957898	-27.314448
2	152.957152	-27.318723
3	152.962864	-27.319509
4	152.962995	-27.316177
5	152.962711	-27.31526
6	152.962614	-27.315138
7	152.96149	-27.314971

1.3 **Locality and property description**

Contextually, the site is located at 107-109 Kremzow Road, bounded to the east by Old North Road, to the north by Kremzow Road, approximately 18 km north west of Brisbane City. Old North Road and South Pine Road to the south east are arterial roads which connect north western suburbs of Brisbane to suburbs further north. The major north-south arterial road, Gympie Road, is approximately five kilometres to the east of the project site, and connects inner Brisbane to the north, continuing further into the Bruce Highway. The existing quarry is in the central portion of the property.

The area surrounding the project site is largely developed into residential lots of varying densities and commercial developments. The project site is mapped as Major Employment Centres Locality, and Extractive Industry. Other zoning nearby includes Urban Locality and Semi-Urban Locality. The majority of land to the north and the east of the project site has been cleared for development. Land to the west and south of the site has been largely cleared for lower density residential, with retention of small tracts of vegetation integrated into the developments. Areas of retained vegetation surrounding the site includes small patches of remnant vegetation, with the majority of vegetation present being disturbed regrowth. Additionally, there is a cleared easement through the middle of the vegetation on the eastern portion of the property.

The referral area covers approximately 18.2 hectares including 16.5 ha of vegetation clearing. Refer to **Figure 1** for the site context and **Figure 2** for the site aerial.

1.4 **Size of the development footprint or work area (hectares)**

The total development footprint is approximately 18.2 hectares and includes 16.5 ha of vegetation clearing.

1.5 **Street address of the site**

107-109 Kremzow Road, Warner, 4500, Queensland

1.6 **Lot description**

The referral area is made up of parts of four allotments, and one entire allotment:

Lot Number	Tenure
Part of Easement A on RP105197	Freehold
Part of Easement A on RP105196	Freehold
Part of Lot 3 on SP174984	Freehold
Part of Lot 4 on SP174985	Freehold
Easement F on SP174985	Freehold

1.7 **Local Government Area and Council contact (if known)**

Not applicable.

1.8 **Time frame**

The project has completed relevant approval processes, and is able to commence post confirmation of EPBC Act requirements. It is anticipated that works to expand the existing quarry will begin in 2016.

1.9 **Alternatives to proposed action**

X	**No** The site has been strategically selected by Boral CSR Bricks Pty Ltd as it is an extension to an existing quarry, therefore will not require the establishment of ancillary infrastructure that would be required if a completely new site was selected. The entire site is also zoned as Extractive Industry, so the proposed action is in keeping with local government intent.

			Yes, you must also complete section 2.2
1.10	**Alternative time frames etc**	**X**	**No** Alternative timeframes are not proposed.
			Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).
1.11	**State assessment**	**X**	**No** The project is not subject to a state environmental impact assessment.
			Yes, you must also complete Section 2.5
1.12	**Component of larger action**	**X**	**No** The project is not being developed as part of a component of a larger action.
			Yes, you must also complete Section 2.7
1.13	**Related actions/proposals**	**X**	**No** This referral is not related to other actions in the region.
			Yes, provide details:
1.14	**Australian Government funding**	**X**	**No** The proponent has not received funding from the Australian Government to undertake the project.
			Yes, provide details:
1.15	**Great Barrier Reef Marine Park**	**X**	**No** The proposed action is not located inside the Great Barrier Reef Marine Park.
			Yes, you must also complete Section 3.1 (h), 3.2 (e)

2 Detailed description of proposed action

2.1 Description of proposed action

The proposed action represents an important opportunity to expand upon an existing quarry, maximising the use of existing roadways and infrastructure, with minimal impacts to the environment. The expansion is proposed on land that is zoned as Extractive Industry under the Moreton Bay Regional Council's *Pine Rivers Plan*, and zoned as industry under the new Moreton Bay Regional Council Planning Scheme. There are two existing Mining Leases over the property. The proposed expansion will form the entire extent of the quarry, with no further stages planned.

The proposed site is at 107-109 Kremzow Road, Warner, Queensland, with the central portion of the property already heavily disturbed by existing quarrying operations. The existing quarry covers 9.14 ha, while the proposed expansion will cover 16.5 ha (refer to **Plan 1**). The proposed expansion will require vegetation clearing, consisting of 8.52 ha Least Concern vegetation and 7.99 ha of non-remnant vegetation. The proposed development includes the retention of 10.75 ha of vegetation (refer to **Plan 2**), in the remaining portion of the two lots south of the most southern easement, and along the northern and eastern boundaries of the site (**Plan 2**). The retention of this vegetation will allow for continuation of any habitat values currently on-site, and a refuge for any native fauna present in the fragmented landscape. The proposed site is completely isolated from surrounding vegetation by Kremzow Road to the north, Old North Road to the east, a wide easement to the south and completely cleared land to the west. Further from the property, the surrounding land is largely cleared for residential developments of differing densities, and commercial developments. Some small fragmented tracts of vegetation remain throughout the lower density residential developments. A cleared easement running east-west through the centre of the properties also fragments the vegetation. **Figure 3** shows the site aerial and remnant vegetation in the surrounding areas, reflecting a high level of fragmentation of ecological habitat.

In terms of environmental impacts and potential impacts on Matters of National Environmental Significance (MNES), the action can be described as:

a) Removal of 8.52 ha of remnant Least Concern vegetation and 7.99 ha of non-remnant regrowth vegetation including some species considered to be Koala food trees;
b) Earthworks linked to creating grades to support quarry, access roads, and drainage patterns;
c) Expansion of quarry hard stand areas.

2.2 Alternatives to taking the proposed action

There are no alternatives proposed (refer to response 1.9).

2.3 Alternative locations, time frames or activities that form part of the referred action

There are no alternatives proposed (refer to response 1.10).

2.4 Context, planning framework and state/local government requirements

The proposed action is planned to occur on land adjacent to an existing quarry, in an area zoned as Extractive Industry.

The subject site is located within the **Moreton Bay Regional Council** Local Government Area, situated within South East Queensland. The project is currently subject to the provisions of the *Moreton Bay Regional Council Planning Scheme*, as well as Queensland's *Sustainable Planning Act 2009* (Qld).

The expansion has gained the following approval, allowing commencement of works:

- Environmental Authority (Mining Lease), Permit #EMPL00499213 for Clay pit, dimension stone, or gemstones – 20b issued by the **Department of Environmental and Heritage Protection** in January 2015**.**

Two approved Mining Leases cover the proposed site – ML1106 and ML1171.

An amendment to the approved mining lease will be resolved after the EPBC Referral is finalised. No other State or Local approvals are required for ongoing operations. A number of conditions, including monitoring and annual reporting, are required to be met throughout the life of the project in order for the permits to remain current.

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

No environmental impact assessments are required under Commonwealth or State legislation.

2.6 Public consultation (including with Indigenous stakeholders)

Not applicable.

2.7 A staged development or component of a larger project

Not applicable. Refer to response to 1.12 and 1.13.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

3.1 (b) National Heritage Places

Description

Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

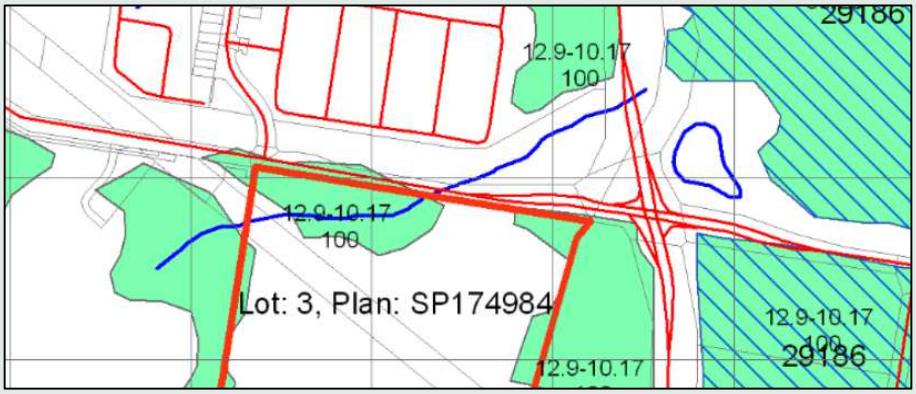
3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

The site is within ten kilometres of Moreton Bay, which is a Ramsar wetland.

Nature and extent of likely impact

No impacts on Moreton Bay are expected as a result of the proposed action. A watercourse is mapped in the north of Lot 3 on SP174984, however this is an isolated stretch which acts as a drainage line and does not directly connect to any other watercourse (see excerpt of vegetation map below). A review of recent aerial photography confirms the watercourse does not connect to any local creeks or rivers, extensive development and earthworks have occurred in the area and that the watercourse appears to drain into a nearby dam (see aerial image below).



Notwithstanding, stringent management measures will be in place to ensure that any sediment erosion and stormwater runoff from the quarry expansion development is captured and treated before being released into local waterways (as enforced through Local and State approvals). This will ensure that any stormwater meets quality standards set by the relevant State and Local Government guidelines.

In summary, it is unlikely that any water flowing from the development site will have a significant impact on Moreton Bay. It is noted that the closest waterway connected to a system that flows into Moreton Bay is 2.5 km away, and the Pine River is over five kilometres from the development site. Land uses between the site and these waterways include rural land, rural residential, and high density residential developments. In the context of the Pine River catchment, it is unlikely that the proposed action will have any notable impacts on water quality in Moreton Bay.

3.1 (d) Listed threatened species and ecological communities

Description

MNES Desktop Assessment

The Protected Matters Search Tool using a two kilometre radius identified the following matters protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) as having potential to occur on site:

- One Threatened Ecological Community (TEC):
  Lowland Rainforest of Subtropical Australia (critically endangered) – community may occur
- Eight listed threatened flora species; and

- Sixteen listed threatened fauna species.

Full search results are provided in **Attachment 1**.

A review of specific habitat niches and distribution of these listed flora and fauna species and TECs using the SPRAT database, Queensland's Wildlife Online Search Tool, previous reporting in the local area and Queensland's Regional Ecosystem and Essential Habitat mapping ruled out the potential for most of these listed matters to occur. This was primarily due to the combined impacts from:

- The disturbed nature of the site, with an existing quarry and a cleared easement;
- Lack of suitable niche habitat across the site, such as large undisturbed waterbodies, rocky outcrops, and coastal habitats;
- Influences from surrounding residential developments and expanding development within the local area;
- Fragmentation of the site by Kremzow Road, Old North Road, and easements;
- Evidence of exotic weeds throughout the site; and
- Disturbances caused by neighbouring land clearing.

An assessment of likelihood of occurrence was conducted for threatened and migratory species listed in the PMST search results. This assessment was based on database and historical field report interrogations, presence or absence of suitable habitat, site features, results of the field surveys and professional ecological judgement. Overall, the assessment identified the potential for Grey-headed Flying-fox (Vulnerable), Swift Parrot (Endangered), and Koala (Vulnerable) to occur on-site due to the availability of potential habitat or food sources when eucalypts are flowering. Based on the desktop review, the Koala was considered as having potential to occur on-site due to the availably of suitable habitat. It was considered unlikely that the Swift Parrot would visit the site, as they are uncommon in South-East Queensland, and there is an abundance of potential food sources of higher quality to the west of the project site. The Grey-headed Flying-fox could potentially be a visitor to the site, however there is an abundance of higher quality potential food sources and habitat to the west of the project site, and the site does not provide any high ecological values for this species. No other listed species or TECs are considered likely to occur on-site (refer to **Table 1**).

Table 1: Likelihood of Occurrence Schedule for EPBC Act Listed Species

HABITAT ASSESSMENT FOR LISTED EPBC SPECIES (8012)				
Listed Threatened Ecological Communities				
Lowland Rainforest of Subtropical Australia		Critically Endangered	This TEC occurs mainly on basalt and alluvial soils and is characteristic of a low abundance of Eucalyptus, Melaleuca and Casuarina species. Specimens with buttress roots are most common throughout this TEC.	No characteristics or species representing this community were observed on or within the immediate vicinity of this site.
Birds				
Anthochaera phrygia	Regent Honeyeater	Endangered	Widespread but sparsely scattered over south east Australia occasionally visits south east Queensland. Range and numbers have contracted significantly since 1940s. Habitat preference for eucalypt woodlands particularly with box and ironbark species, especially in moister, more fertile sites along creeks, valleys and lower foothills. Sometimes found in river she oaks *Casuarina cunninghamiana*, particularly where mistletoe is present. Although the site contains areas of suitable habitat there are no recent reliable records from the vicinity. Its occurrence therefore is unlikely and the higher value habitats are being retained. No significant impact. **Species is unlikely to occur on site.**	Not observed.
Botaurus poiciloptilus	Australasian Bittern	Endangered	The Australasian Bittern occurs in terrestrial wetlands and, rarely, estuarine habitats, mainly in the temperate southeast and southwest. It favours wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and / or reeds or cutting grass growing over muddy or peaty substrate. The Australasian Bittern occurs in the far South-East of Queensland; it has been reported North to Baralaba and West to Wyandra, although in most years it is probably confined to a few coastal swamps. It is rarely recorded in Queensland, and possibly survives only in protected areas such as the Cooloola and Fraser regions. **Unlikely to occur as this species is restricted to protected un-degraded wetlands which does not occur on site.**	Not observed.
Dasyornis brachypterus	Eastern Bristlebird	Endangered	The Eastern Bristlebird inhabits low dense vegetation in a broad range of habitat types including sedgeland, heathland, swampland, shrubland, sclerophyll forest and woodland, and rainforest. It occurs near the coast, on tablelands and in ranges. The Eastern Bristlebird is found in habitats with a variety of species compositions, but is defined by a similar structure of low, dense, ground or understorey vegetation.	Not observed.

			The vegetation structure harbours relatively sparse and patchy understorey vegetation and is not expected to occur.	
Erythrotriorchis radiatus	Red Goshawk	Vulnerable	No confirmed local records of this uncommon species. A wide ranging and highly mobile species generally observed over eucalypt habitats. Due to the scarcity of this species and lack of local records its occurrence is highly unlikely. The proposed actions will result in a minor loss of habitat for the species and its prey. No notable impact will result. **Species is unlikely to occur on site.**	Not observed.
Geophaps scripta scripta	Squatter Pigeon (southern)	Vulnerable	This species inhabits open grasslands and woodlands typically with a native understorey although may occur in artificial pasture. No confirmed local records. The species is now very rarely observed in southern Queensland. Not expected onsite and no direct impact from proposed actions. **Species is unlikely to occur on site.**	Not observed.
Lathamus discolor	Swift Parrot	Endangered	Swift Parrots breed in Tasmania during spring to early summer. During autumn and winter the species migrates to the mainland where it follows a nomadic existence linked to the availability and timing of flowering of trees in various locations. While the species is very uncommon in south-east Queensland, its occurrence cannot be completely discounted. There are suitable winter flowing species present on the site which may attract birds during flowing (e.g. *E. tereticornis*). **Species is a potential rare visitor to flowering eucalypts in SEQ and is not expected on site.**	Not observed.
Rostratula australis	Australian Painted Snipe	Vulnerable	The Australian Painted Snipe is usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled. The species has a scattered distribution throughout many parts of Australia, with a single record from Tasmania. **No suitable riparian habitat or wetlands occur on-site and is not expected to occur.**	Not observed.
Turnix melanogaster	Black-breasted Button-quail	Vulnerable	Typical habitat occurs in dry rainforest and vegetation immediately adjacent to rainforest. However the species has also been recorded in a variety of low coastal heathlands around Fraser Island and nearby mainland. Deep leaf litter in which the species can forage appears to be particularly favoured. Habitats on the site are disturbed due to prior disturbances, weed invasion and prior pastoral/grazing activities. **Species is unlikely to occur on site due to the level of disturbances on and immediately adjacent to the site. No platelets were observed at the time of the assessment.**	Not observed.

Mammals				
Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat	Vulnerable	This species roosts in caves, crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin. No confirmed local records of this uncommon species. Inhabits mesic vegetation. Not expected to occur and no impact expected. **No habitat to support this species, including roosting sites were observed on site. Species is unlikely to occur.**	Not observed.
Dasyurus hallucatus	Northern Quoll	Endangered	The Northern Quoll is known to occur as far south as Gracemere and Mr Morgan, south of Rockhampton and as far north as Cooktown. The species occupies rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grassland and desert. **No habitat to support this species, including den sites were observed on site. Species is unlikely to occur.**	Not observed.
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Endangered	The Spotted-tailed Quoll is recorded across a range of habitat types including rainforest, open forest, woodland, coastal health and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow bearing trees, fallen logs, small caves, rock outcrops and rocky cliff faces as den sites. **No habitat to support this species, including den sites were observed on site. Species is unlikely to occur.**	Not observed.
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala (combined populations of QLD, NSW and the ACT)	Vulnerable	Koala are found in a range of habitats, from coastal islands and tall eucalypt forests to low woodlands inland. The species is known from the broader area and as part of this survey evidence was collected showing usage of the site. No individual specimens were observed at the time of the assessment. **Species potential to occur, habitat observed.**	Not observed however evidence of koala usage in the form of scats and scratches was observed.
Potorous tridactylus tridactylus	Long-nosed Potoroo (SE mainland)	Vulnerable	Species generally prefers rainforest and adjacent to wet sclerophyll forest, coastal heathlands and similar habits with a dense understorey. The species is unlikely to occur as there is no suitable habitat on-site. No local records and no direct relevance to the proposed action. **No habitat to support this species is observed on site. Species is unlikely to occur.**	Not observed.

Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Species generally roosts in camps in trees adjacent to larger permanent watercourses than those which occur onsite. There is no suitable roosting habitat on site and no camps are currently active in the vicinity. However this species is likely to forage on site when eucalyptus and melaleuca species are flowering and particularly during winter when these provide important resources for this species. It is a common species in SEQ and there is unlikely to be any notable loss of resources or significant impact on the species long term viability with the retention of all mature remnant communities. **Potential visitor to site when eucalypts are in flower.**	Not observed. Potential to occur when Eucalypts are in flower.
Plants				
Arthraxon hispidus	Hairy Joint Grass	Vulnerable	Hairy-joint grass is found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps as well as woodland. It has also been recorded growing around freshwater springs on coastal foreshore dunes, in shaded small gullies, on creek banks and on sandy alluvium in creek beds in open forests. **Unlikely to occur on-site due to lack of suitable habitat.**	Not observed.
Bosistoa transversa	Three-leaved Bosistoa, Yellow Satinheart	Vulnerable	The Three-leaved Bosistoa is conserved within Mt Warning National Park, Numbinbah Nature Reserve, Limpinwood Nature Reserve and Whian Whian State Forest. While population information is unavailable, it is thought to be common in its range. It generally grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 3oo meters in altitude. It is commonly associated with *Argyrodendron trifoliolatum, Syzygium hodgkinsoniae, Endiandra pubens, Dendrocnide photinophylla, Acmena ingens, Diploglottis australis* and *Diospyros mabacea.* **Unlikely to occur on-site due to lack of suitable habitat.**	Not observed.
Corchorus cunninghamii	Native Jute	Endangered	*Corchorus cunninghamii* generally occurs on upper hillslopes or hillcrests at low to mid elevations of 110-430 m above sea level. The species is found in the narrow ecotone between subtropical rainforest and open eucalypt forest. **Unlikely to occur on-site due to lack of suitable habitat.**	Not observed.
Cryptocarya foetida	Stinking Cryptocarya, Stinking Laurel	Vulnerable	*Cryptocarya foetida* is a rainforest tree growing at the eastern coastal parts of Australia between Iiuka, New South Wales and Fraser Island, in Queensland. This is a littoral rainforest species. **Unlikely to occur on-site due to lack of suitable habitat.**	Not observed.
Macadamia integrifolia	Macadamia Nut, Queensland Nut, Smooth-shelled Macadamia, Bush Nut, Nut Oak	Vulnerable	The Macadamia Nut grows in remnant rainforest, preferring partially open areas such as rainforest edges. It prefers to grow in mild-frost free areas with reasonably high rainfall. The vegetation communities where this species is found range from complex notophyll mixed forest, extremely tall closed	Not observed.

			forest, simple notophyll mixed very tall closed forest to simple microphyll to simple microphyll-notophyll mixed mid-high closed forest with Araucaria and Argyrodendron emergents. **Unlikely to occur on-site due to lack of suitable habitat.**	
Phaius australis	Lesser Swamp-orchid	Endangered	The Lesser Swamp-orchid is commonly associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp Mahogany are found. Typically, the Lesser Swamp-orchid is restricted to the swamp-forest margins, where it occurs in swamp sclerophyll forest (Broad-leaved Paperbark/Swamp Mahogany/Swamp Box (*Lophostemon suaveolens*)), swampy rainforest (often with sclerophyll emergents), or fringing open forest. It is often associated with rainforest elements such as Bangalow Palm (*Archontophoenix cunninghamiana*) or Cabbage Tree Palm (*Livistona australis*). **Unlikely to occur on-site due to lack of suitable habitat.**	Not observed.
Phebalium distans	Mt Berryman Phebalium	Critically endangered	Mt Berryman Phebalium is found in semi-evergreen vine thicket on red volcanic soils, or in communities adjacent to this vegetation type. Geology of the area in which this species occurs is deeply weathered basalt with undulating to hilly terrain. Soils range from red-brown earths to brown clays (derived from siltstone and mudstones), and lithosols to shallow, gravelly krasnozems (very dark brown loam), derived from the Main Range Volcanics of the Tertiary period. Vegetation associations in which Mt Berryman Phebalium occur include microphyll to notophyll vine forest with or without *Araucaria cunninghamii* and low microphyll vine forest and semi-evergreen vine thicket with or without *Araucaria cunninghamii* which can be divided further into regional ecosystems depending on substrate, geography and associated vegetation species. **Unlikely to occur on-site due to lack of suitable habitat.**	Not observed.
Thesium australe	Austral Toadflax	Vulnerable	Austral Toadflax is semi-parasitic on roots of a range of grass species, notably *Themeda triandra* (Kangaroo Grass). It occurs in shrublands, grassland, or woodland, often on damp sites. **The species is unlikely to occur on site.**	Not observed.
Reptiles				
Delma torquata	Collared Delma	Vulnerable	In general, the species occurs on rocky hillsides on basalt and lateritic soils supporting open eucalypt and *Acacia* woodland with a sparse understorey of shrubs and tussocks or semi-evergreen vine thicket. **No suitable habitat for this species occurs on-site.**	Not observed.

Furina dunmalli	Dunmall's Snake	Vulnerable	Dunmall's Snake has been found in a broad range of habitats, including forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow other Wattles, native Cypress or Bull-oak, and various Blue Spotted Gum, Ironbark, White Cypress Pine and Bulloak open forest and woodland associations on sandstone derived soils. Dunmall's Snake occurs primarily in the Brigalow Belt region in the South-eastern interior of Queensland. Records indicate sites at elevations between 200–500 m above sea level. The snake is very rare or secretive with limited records existing. It has been recorded at Archokoora, Oakey, Miles, Glenmorgan, Wallaville, Gladstone, Lake Broadwater, Mount Archer, Exhibition Range National Park, roadside reserves between Inglewood and Texas, Rosedale, Yeppoon and Lake Broadwater Conservation Park. **No suitable habitat for this species occurs on-site.**	Not observed.

Assessment of Occurrence and Field Survey Results

Senior Ecologists from **Saunders Havill Group** conducted field assessments across the site in October 2015 to identify any potential MNES fauna or flora and an assessment of suitable habitats on the application allotments. Overall, the central portion of the site is highly disturbed as a result of existing quarrying operations, and the remainder of the site is fragmented from vegetation due to past land uses and surrounding development (refer Response 3.3 (g)), which have left the proposed development area largely devoid of significant habitat values (refer to the site ecological assessment report provided as **Attachment 2**).

Koala (*Phascolarctos cinereus*)

Conservation Status

Under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act), Koala populations in Queensland, New South Wales, and the Australian Capital Territory are listed as Vulnerable. Koalas are also listed as Vulnerable under Queensland's *Nature Conservation Act 1992* (Qld) (NCA). The site is located within the modelled distribution of the Koala, within the 'coastal context,' as per the EPBC Act Referral Guidelines for the Vulnerable Koala.

Habitat

As described in the Koala SPRAT species profile, Koalas inhabit a wide range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by eucalypt species. Under the Koala Referral Guidelines, Koala habitat is defined as *'any forest or woodland containing species that are known Koala food trees or shrubland with emergent food trees. This can include remnant or non-remnant vegetation in natural, agricultural, urban and peri-urban environments.'*

Distribution

Koalas are endemic to Australia and have a known distribution from north-eastern Queensland to south-east South Australia. They are widespread within coastal and inland areas, however, densities of Koalas are higher within coastal areas with higher average annual rainfalls. South-east Queensland is known to support Queensland's highest density of Koalas.

Threats

The three main threats to Koalas have been identified within the SPRAT profile as:

- Habitat loss and fragmentation;
- Vehicle strike; and
- Predation by domestic or feral dogs.

In addition, the prevalence of disease such as the *Chlamydia* virus in many Koala populations has led to symptoms such as infections of the eyes, urinary tract, respiratory tract and reproductive tract, with the latter having the potential to lead to infertility in females. More recently, Koala Retrovirus (KoRV) has had an increasing impact on most Queensland Koala populations. While most Koalas carry the disease, environmental stresses such as poor nutrition and overcrowding lead to conditions caused by KoRV such as leukaemia and immunodeficiency syndrome.

Field Assessment

In October 2015, Senior Ecologists from **Saunders Havill Group** conducted targeted Koala field surveys across the site with weather conditions fine and sunny. The purpose of the survey was to determine the level of Koala usage across the site and to assess the availability of suitable habitat. The assessment involved the following methods:

- Spot Assessment Technique (SAT) developed by Phillips and Callaghan (2011); and
- Opportunistic searches.

SAT Survey Results

Overall, evidence of Koala usage in the form of scats was considered to be medium to high across the site, however, despite intensive searches, no Koalas were observed. Eleven SAT surveys were conducted across the referral site, as shown by the Field

Survey Effort presented in **Plan 3**. As outlined in **Table 2**, Koala usage in the form of scats was classified as "Medium" in two surveys, and "High" in the other nine. Refer to **Attachment 2 – Appendix E** for the full SAT results. These estimates are taken from the **Australian Koala Foundation** Koala activity level classification table using the East Coast (med-high) Activity Category (**Table 3**). The East Coast (med-high) Activity Category is applicable in habitats dominated by residual, transferral or alluvial type landscapes considered med-high nutrient soils with good water holding capacity (Steve Phillips, personal communication). Dermosols cover the entire application area; these soils suit this landscape description (refer response 3.3(c) and **Attachment 2**).

Table 2: SAT Survey Results

SAT (Spot Assessment Technique) Assessment No.	Evidence of Koala Use (%)	Koala Use (High / Medium / Low)
1	53.33	High
2	36.67	High
3	26.67	Medium
4	46.67	High
5	40.00	High
6	26.67	Medium
7	36.67	High
8	43.33	High
9	46.67	High
10	56.67	High
11	53.33	High

Table 3: AKF Koala Activity Level Classification Table

ACTIVITY CATEGORY	LOW USE	MEDIUM (NORMAL) USE	HIGH USE
Area (density)			
East Coast (low)	< 9.47%	≥ 9.47% but ≤ 12.59%	> 12.59%
East Coast (med – high)	< 22.52%	≥ 22.52% but ≤ 32.84%	> 32.84%
Western areas (med – high)	< 35.84%	≥ 35.84% but ≤ 46.72%	> 46.72%

Queensland's Koala Habitat Values Map (see **Attachment 2 – Figure 5**), shows that the site contains a mixture of vegetation, with High Value Bushland Habitat, and Medium and High Value Rehabilitation Habitat in the area proposed to be the quarry expansion. Regional Ecosystem mapping identifies the majority of the proposed expansion area to be within patches of Least Concern RE 12.9-10.17, with the remaining areas mapped as Category X (non-remnant vegetation). This RE is not mapped as providing 'essential habitat' for the Koala. Refer to **Attachment 2 – Figure 4**.

Summary of Findings

The key findings from the field assessment are:

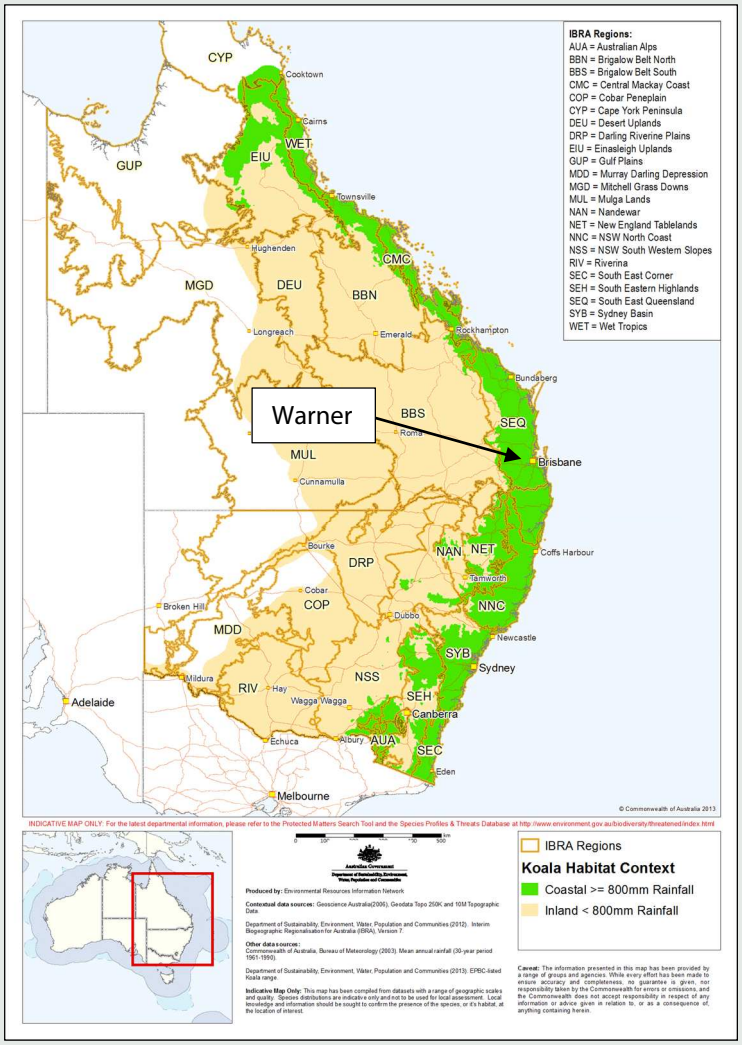
- No Koalas were observed on or surrounding the site;
- Evidence of Koala suggests Medium to High usage throughout the site;
- Overall, the site was significantly disturbed as a result of historical vegetation clearing and existing quarry operations, invasion of weeds, and impacts from surrounding development; and
- The site is not considered to provide ideal habitat for Koalas.

The following analysis is an assessment against the EPBC Act Referral Guidelines for the Vulnerable Koala.

What is the geographic context of the proposal site?

A search of the EPBC Protected Matters Search Tool within a 2 km buffer lists the Koala as potentially located on-site (**Attachment 1**). As per the EPBC Act Referral Guidelines for the Vulnerable Koala, the site is therefore considered to fall within the modelled distribution of the Koala.

The Koala Referral Guidelines separate the geographical context into two zones, inland and coastal, based on the 800 mm per annum rainfall isohyet. The Kremzow Road site is mapped within a "coastal" area as per the distribution map (below). Therefore the coastal habitat attributes contained in the Koala Referral Guidelines are relevant when using the Habitat Assessment Tool.



Does the site contain habitat critical to the survival of the Koala?

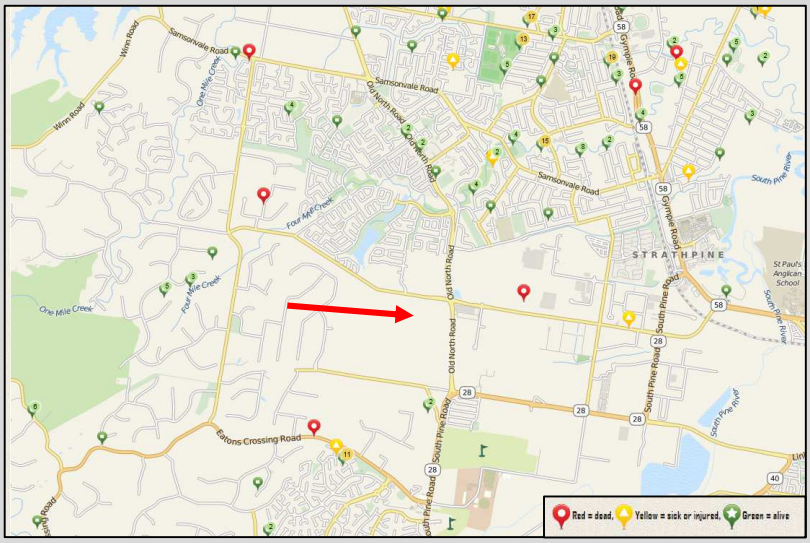
Assessments

In accordance with the EPBC Act Referral Guidelines for the Vulnerable Koala, any habitat which receives a score of **5 or more** using the Koala Habitat Assessment Tool is considered to be critical habitat. The proposed site has scored a habitat assessment score of 5 based on the calculations and descriptions presented in **Table 4**.

Table 4: Koala Habitat Assessment Tool

Attribute	Score	Comment
Koala occurrence	+2 (High)	Desktop A Protected Matters Search (PMST) of a two kilometre (km) radius of the subject site identifies the Koala as known to occur within the vicinity of this area (**Attachment 1**). A Wildlife Online search report using a 2 km radius found 516 records of the Koala (**Attachment 2** - **Appendix C**). The dates of these sightings are unknown. Additionally, the site is located within the Pine Rivers area, which is one of the two areas that Species Profile and Threats Database (SPRAT) population estimates have focused on.
		On-ground A habitat tree survey (including assessment for Koala usage) was carried out over the site on 20 October 2015. Of the 11 Spot Assessment Techniques (SATs) carried out, nine were considered to display signs of "high" Koala use, and two of "medium" Koala use, indicating high use over the majority of the site (refer to **Attachment 2** - **Appendix E** for further details on site surveys including results of SAT assessments). **As there is evidence of one or more Koalas on-site within the last two years, the 'Koala Occurrence' attribute has been given a score of +2 (High).**
Vegetation composition	+2 (High)	Desktop The Queensland Government Regulated Vegetation Supporting Map (Regional Ecosystem V8.0) identifies the proposed development area as containing Category B remnant vegetation (refer to **Attachment 2 – Figures 3 and 4**). The Least Concern Regional Ecosystem (RE) 12.9-10.17 - *Eucalyptus acmenoides*, *E. major, E. siderophloia* +/- *Corymbia citriodora subsp. variegata* woodland on sedimentary rocks - occurs around the majority of the site boundary, and extends toward the middle of the site. The south east portion of the site has Of Concern RE 12.3.11 - *Eucalyptus tereticornis* +/- *Eucalyptus siderophloia, Corymbia intermedia* open forest on alluvial plains usually near coast mapped - associated with a waterway. The area mapped as RE 12.3.11 will not be impacted by the proposed expansion. Both REs include koala habitat species in their descriptions. The remaining extent of the site is mapped Category X non-remnant. We note that current RE mapping is yet to be updated to reflect recent lawful clearing undertaken on the site and also on the adjacent land to the west of the site which has reduced the extent of remnant vegetation in the area, reducing the extent of remnant vegetation.
		On-ground This site contains known Koala Food Trees within the remnant and regrowth woodland areas. Primary and Secondary Koala Food Trees as classified by the Australian Koala Foundation for the Moreton Bay Regional Council area identified on-site include: Primary - *Eucalyptus tereticornis* and *E. microcorys*; Secondary - *E. major*, *E. racemosa*, *E. resiniferia*, and *E siderophloia*. Refer to **Attachment 2** for full species list. **As the zone contains a woodland with 2 or more known koala food tree species, the 'Vegetation Composition' attribute is given a score of +2 (High).**
Habitat connectivity	0 (Low)	The location of roads, combined with land uses in the vicinity of the site, significantly reduce the availability of connected habitat for the Koala and act as physical barriers for safe Koala movement. The adjacent property to the west has been cleared for the purposes of an urban subdivision, with a rural residential development further west. Kremzow Road bounds the northern portion of the site, and is a busy two-lane road connecting outer Brisbane suburbs, with residential development to the north. Of note, a council-determined Koala corridor exists around the residential development immediately to the north of Kremzow Road with exclusion fencing; resulting in two physical barriers (Kremzow Road and exclusion fencing), making the Koala corridor unavailable to any Koalas located on the site of interest. Rural residential development exists to the south of the site, and the land is mostly cleared aside from some scattered mature individuals. The eastern side of the site is bounded by Old Northern Road, creating a physical barrier to Koala movement. Old Northern Road is a busy two-lane road connecting outer Brisbane suburbs and intersects the four-lane South Pine Road just to the south of the site. On the eastern side of Old

		Northern road there is commercial development; the land is extensively cleared, and leads to urban residential development (refer **Figures 1 & 2**). Zoning in the *Pine Rivers Plan* earmarks all areas to the south and west of the site as future urban and residential, therefore it is likely that vegetation will be cleared in the future, inhibiting habitat connectivity. The site may provide some low-range habitat as an extension to vegetation in the rural residential land to the west, however there is minimal habitat to the north, east, and south of the site, and the busy roads to the north and east (and smaller local roads within the rural residential area) present physical barriers to Koala movement. As such, it is expected that the site provides very limited connectivity value for Koala dispersal and persistence in the broader landscape. **The site is not considered to be part of a contiguous habitat landscape ≥ 300 ha and has been designated with a 'habitat connectivity' score of 0 (Low).**
Key existing threats	+1 (Medium)	<u>Desktop</u> It is clear that there are a number of threats to the survival of the Koala, namely vehicle strikes and dog attacks, associated with adjacent residential areas and main roads. These threats will increase as the area is further developed. The **Australian Koala Foundation (AKF)** Koala map (below) shows sightings in the vicinity of the site, with the closest sightings being approximately 1 km away. There are multiple sightings recorded in the residential area to the north and in the rural residential area to the west of the site. There are also records of Koala sick with disease near the site. **AKF Koala Map**  Koala Tracker is a crowd sourced National Koala sighting record. In the immediate vicinity, the Koala tracker map (below) shows two sightings of Koala south of the site. There are multiple sightings recorded to the north of the site (as close as approximately 1 km away), as well as sightings to the west and south. Of note, there are two records of vehicle strike along Kremzow Road (one death less than 1 km away, and one injury).

		A death by vehicle strike was also recorded on Eatons Crossing Road to the south. Additionally, there are three records of death by disease and one sick by disease within approximately 4 km. **Koala Tracker Map**  **On-ground** The increasing level of vehicle use in the surrounding area and the expansion of residential development, bringing with it an increased number of dogs and cars, present significant threats of injury and death to Koalas. As surrounding residential development expands and encompasses the site, these threats are likely to increase in scale and intensity. There has been at least three Koala deaths recorded within 3 km of the site, due to vehicle strike and disease. It can be inferred that the impacts of vehicle strike, disease and dog attack are likely to continue to cause death and injury to Koalas. **As there is strong evidence of Koala mortality factors in the area and deaths from vehicle strike recorded within 3 km of the study site, the 'Key Existing Threats' attribute has been given a score of +1 (Medium).**
Recovery value	0 (Low)	The vegetation on the subject site is not considered to be important in achieving the Interim Recovery Objectives for the coastal context given its foundation on the ability to protect and conserve large connected areas of Koala habitat. Koala Context Attributes listed under Interim Recovery Objectives in Table 1 of the Guidelines for coastal areas are to: 1) Protect and conserve large, connected areas of Koala habitat, particularly large connected areas that support Koalas that are: ▪ of sufficient size to be genetically robust or operate as a viable sub-population, or; ▪ are free of disease or have a low incidence of disease, or; ▪ are breeding. 2) Maintain corridors and connective habitat that allow movement of Koalas between large areas of habitat. The site retains little opportunity to achieve the interim recovery objectives for coastal areas, which is based primarily on maintaining large areas of bushland and connectivity. The site falls within the Urban Footprint of the South East Queensland Regional Plan and, as such, along with its immediate surrounds, is slated for urban development and so not likely to achieve recovery objectives. The site in question has an existing Mining Lease and associated Environmental Authority over the whole property authorising the existing quarry. The *Pine Rivers Plan* zones the property as extractive industry. The adjacent western property has been cleared for urban subdivision. Land to the south and east of the property has been largely cleared, and busy

		roads to the east and north inhibit connectivity of habitat. The surrounding south and west area is zoned in the *Pine Rivers Plan* as future urban. The site is fragmented from vegetation patches within the broader landscape, and with future development this fragmentation will increase. Additionally, there is a maintained cleared easement running east-west through the property. In addition, the regional Koala population is not considered to be genetically diverse from other SEQ Koala populations, and instances of sickness and death are described above indicating the local population is not free of disease. During the site visit no Koalas were observed, including no observation of female Koalas or breeding on the site. Overall, the increasing fragmentation of the site to surrounding habitat areas, the location of the site being adjacent to (rather than in the middle of) vegetation, and the lack of safe Koala movement opportunities make it unlikely that the retention of the proposed development area will aid the Interim Recovery Objectives for the coastal context being achieved. Further, the site has already been approved for extractive activities through an Environmental Authority. It is noted that the project will not cause further fragmentation of surrounding habitat as it is bounded by roads and residential development on two sides, and rural residential and cleared for a planned subdivision on the remaining two sides. **Given the habitat present on site is not considered to be important for achieving the interim recovery objectives for the relevant context, the "Recovery Value" attribute has been given a score of 0 (Low).**
Total	**5**	**As the habitat score is five or more, this site is considered to provide Critical Habitat for the Koala.**

Will the action adversely affect habitat critical to the survival of the Koala?

The above assessment concludes that the site contains areas of critical habitat. The Koala Referral Guidelines also require the adversity of impacts to be assessed. This process follows a "yes/no" flowchart as shown in the Guidelines, with responses provided below:

1. **Does your impact area contain habitat critical to the survival of the koala (habitat score ≥5).**
   Yes, the proposed development area contains habitat that received a habitat score 5 (refer to **Plan 2**).

2. **Does the area proposed to be cleared contain known Koala food trees?**
   Yes, habitat assessments conducted across the site found that site canopy trees contain species that are considered to be Secondary Koala Food Trees with some Primary Koala Food Trees.

3. **Are you proposing to clear ≤2 hectares of critical habitat?**
   No, the action requires the clearing of approximately 16.5 ha of critical habitat as defined by the EPBC referral guidelines (refer to **Plan 2**).

4. **Are you proposing to clear ≥20 hectares of habitat that scored ≥8.**
   No, the action requires the clearing of approximately 16.5 ha of critical habitat that scored less than 8.

5. **Assessment on Characteristics**
   Reviewing the site against the characteristics outlined in the flowchart indicates the proposed action displays characteristics that reduce adverse effects including:

   - 16.5 ha is considered a smaller area of habitat (<20 ha);
   - Although the proposal requires the clearing of approximately 16.5 ha of habitat of variable quality, only 8.5 ha is remnant vegetation, with the 8 ha being non-remnant;
   - The habitat score of 5 for the site is the lowest range score for "critical habitat";
   - Only evidence of Koala activity in the form of scats and scratches was recorded on-site; and

- Clearing will not result in fragmentation of a habitat area from a larger habitat area, as this site forms a relatively isolated and disturbed node surrounded on most sides by various forms of development including major arterial roads.

Overall, the impact on koalas as a result of the proposed quarry expansion are considered to be minor due to the low-range habitat value score of critical habitat on the site, the total area to be cleared (16.5 ha), no Koalas being recorded on-site, existing quarrying activities on-site, and the existing barriers to Koala dispersal to and from the site.

Could the action interfere substantially with the recovery of the Koala?
In addition to considering adverse impacts on critical habitat, the potential for the action to interfere with the recovery of the Koala must also be considered as per the Koala Referral Guidelines. Possible impacts listed in the guidelines that must be considered include:

- Introducing or increasing koala fatalities due to dog attacks;
- Introducing or increasing the risk of vehicle strike;
- Facilitating the introduction or spread of disease and pathogens;
- Creating a barrier to movement; and
- Degrading critical habitat due to hydrological changes.

These impacts, as well as mitigation measures to address impacts, are discussed in **Table 5**.

Table 5: Potential Impacts

Dog Attack
This proposed development will not increase the number of dogs entering the area. The residential areas surrounding the site are likely to be increasing dog attack pressure on the Koala populations. Dog attacks on Koalas will not increase as a result of this development. **No residual impacts are identified.**
Vehicle Strike
It is likely that vehicle activity through the area will increase as a result of the expansion. Given the site is surrounded by arterial roads and various forms of development (which have increased traffic in the vicinity in recent years), interaction between vehicles and Koalas is considered unlikely to increase significantly from its current status as a result of the development. Road design, signage and the imposition of a low vehicle speed will help mitigate any potential risks to Koalas. **No residual impacts are identified.**
Disease and Pathogens
Most of South East Queensland's Koala populations already have a high prevalence of *Chlamydia* infection and Koala Retrovirus. The symptoms of these diseases are often observed within Koala populations undergoing environmental stresses, such as overcrowding and poor nutrition. Koala disease has been recorded near the site. The project is unlikely to cause pressure on the local Koala population to the point where these diseases manifest and the project is extremely unlikely to introduce or spread disease or pathogens into Koala habitat areas. **No residual impacts are identified.**
Barriers to Dispersal
While the development will restrict Koala movement through the site, it is arguable that this will result in impacts to dispersal given the existing barriers to movement surrounding the site, and lack of vegetation connectivity. As it currently stands, the site is largely fragmented from other habitat patches due to arterial roads and encroaching development. Further fragmentation may result from future urban development planned immediately to the west and

south of the area. As such, the impacts from potential barriers to dispersal within the development area are considered to be minimal.

No residual impacts are identified.

Hydrological Change
The increase in hardstand areas across the site has the potential to affect its hydrology and management plans will be implemented to address the requirements of State and Local government guidelines to ensure that impacts are minimised. It is unlikely that the hydrology of vegetated areas to the west or south will be adversely affected. As such, the project is unlikely to result in hydrological changes that will further degrade the site or impact neighbouring areas of potential Koala habitat. **No residual impacts are identified.**

Field and desktop assessments against the Referral Guidelines for the Vulnerable Koala were utilised for the following Significant Impact Assessment (**Table 6**) based on the *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance.*

Table 6: Significant Impact Assessment – Koala

Significant Impact Criteria	Description	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1. Lead to a long term decrease in the size of an important population of a species.	While the site contains habitat considered as critical for the Koala as defined by the referral guidelines, the potential impact area is approximately 16.5 ha of fragmented habitat with a score of 5, which is the threshold for what is considered critical habitat. Of note, the referral area is zoned as Extractive Industry under local and state planning instruments, and is surrounded by rural, rural residential, residential, and commercial development. It is likely that the site will continue to become more fragmented due to current and future urban development. In addition, field assessments failed to locate Koalas on-site, despite targeted searches, with only evidence of Koala usage recorded in the form of scats and scratches. As such, Koalas that potentially utilise this site are considered to be transient and more likely to inhabit more optimal habitat to the west of the site. It is therefore unlikely that an important population is present on-site, and so the action is considered unlikely to decrease the size of an important population. Further, if Koalas are observed on-site, moving them to an area of protected vegetation will be beneficial for the Koala and reduce potential future mortality.	**No significant impact likely**
2. Reduce the area of occupancy of an important population.	An important population is not considered to be present on the subject site for the following reasons: ▪ No Koalas (only evidence of their activity) have been recorded on-site; ▪ The site contains low-range quality critical habitat, with more optimal habitat to the west of the site; ▪ The site is completely isolated and not connected to any other Koala habitat, with main roads bounding two sides of the site, a completely cleared property to the west, and a wide cleared easement to the south; and ▪ Koala records in the vicinity of the site include specimens carrying disease. As such, the proposal is not considered to reduce the area of occupancy of an important population.	**No significant impact likely**
3. Fragment an existing important population into two or more populations.	The referral site is already significantly fragmented from surrounding habitat. The vegetation on-site is isolated on all sides, with Kremzow Road to the north, Old North Road to the east, a completely cleared property to the west, and a wide, cleared easement to the south. Additionally, the properties proposed for the development already have an existing quarry operating. Further, an important population of the Koala is not considered to utilise the site given the low number of specimen records in the vicinity.	**No significant impact likely**

4. Adversely affect habitat critical to the survival of a species.	While the proposed action results in the removal of Koala habitat, this habitat is relatively disturbed by quarrying activities on-site and subject to edge effects from surrounding arterial roads and development. Further, this habitat is not considered to be unique or of special value. Given its relatively disturbed nature and zoning as Extractive Industry, site habitat is not considered of importance to the interim recovery objectives for the Koala. Although it is acknowledged that critical habitat for the Koala as assessed under the Guidelines will be cleared, site habitat was scored as the lowest score-range and Is not considered to constitute high value or unique habitat. Additionally, given the presence of more optimal habitat to the west, in the Clear Mountain area and associated state forest, the extent of potential loss is not considered to adversely affect the survival of the species.	**No significant impact likely**
5. Disrupt the breeding cycle of an important population.	Site surveys did not identify any breeding Koalas. Evidence of Koala activity in the form of scats was recorded on-site, however, no individuals were recorded despite targeted searches. As such, the site is considered to most likely support transient individuals unlikely to constitute a breeding population or an important population. Therefore, it is considered unlikely that the breeding cycle of an important population will be disrupted by the proposed action.	**No significant impact likely**
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The habitat observed on this site did not contain any special or unique values. The removal of habitat for the proposed quarry expansion is unlikely to have a significant impact on the availability of habitat throughout the broader landscape, given the vast quantity and availability of Koala habitat in the Clear Mountain area, approximately 4 km to the west of the site. Individuals utilising the proposal site are considered to be transient and not part of an important population. As such, the proposal is not considered likely to lead to species decline.	**No significant impact likely**
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Domestic dogs have the potential to become feral, are considered a major threat to Koala survival and are present in the surrounding landscape. The proposed action is not likely to increase the density of domestic dogs in the area. Invasive *Lantana camara* is present on-site and is a recognised hindrance to Koala dispersal. It is likely that this invasive plant will be suppressed under the requirements of the quarry expansion construction and ongoing operation. It is unlikely that the proposal will augment invasive species already present in the area.	**No significant impact likely**
8. Introduce disease that may cause the species to decline.	Most of South East Queensland's Koala populations already have a high prevalence of Chlamydia infection and Koala Retrovirus (KoRV). Sick Koalas (and Koala death from disease) have been recorded in the vicinity of the referral area. As such, the project is considered unlikely to cause pressure on the local Koala population to the point where these diseases manifest and the project is extremely unlikely to introduce or spread disease or pathogens into Koala habitat areas.	**No significant impact likely**
9. Interfere substantially with the recovery of the species.	Analysis suggests the action is unlikely to interfere substantially with the recovery of Koala (**Table 5**), primarily due to the relatively disturbed nature of the site, its current relatively high level of fragmentation, planning intent, encroaching development, and a lack of records of the Koala utilising the site.	**No significant impact likely**

Koala summary

Targeted field surveys as per EPBC Act guidelines completed across the site resulted in no Koala observations on or surrounding the referral area. SAT transects found Medium to High activity levels for the Koala, indicating that the site has usage by Koalas, however the site vegetation is completely isolated from surrounding vegetation. Field assessments found that the site is dominated by species that are not identified as Koala Food trees, however, lower proportions of Primary and Secondary Koala Food Trees were recorded. The critical habitat on the site was given a habitat assessment score of 5 under the Koala Referral Guidelines.

As discussed above, a number of factors diminish the adversity of impacts caused by the proposed clearing of 16.5 hectares of critical habitat. These factors can be summarised as:

- Although the proposal requires the clearing of approximately 16.5 ha of habitat of variable quality (see **Attachment 2** for data), only 8.5 ha of Least Concern remnant vegetation will be cleared, and 8 ha of non-remnant vegetation;
- 16.5 ha is considered a smaller area of habitat (<20 ha);
- The habitat score of 5 for the site is the lowest range score for "critical habitat";
- Dogs currently utilise the surrounding area, and are likely to use the site;
- No Koalas were observed on-site;
- Only evidence of Koala activity in the form of scats and scratches was recorded;
- Clearing will not result in fragmentation of a habitat area from a larger habitat area, as this site is completely isolated from other vegetation and is limited on all sides by cleared lands and arterial roads; and
- Vegetation clearing will be undertaken sequentially under the guidance of a fauna spotter-catcher. This will ensure that the potential for injury or death to Koalas, if present, as a result of clearing is minimised. Additionally, any Koalas found on-site will be relocated to an area of suitable habitat with a lower chance of mortality.

Grey-headed Flying-fox (*Pteropus poliocephalus*)

Pteropus poliocephalus (Grey-headed Flying-fox) requires foraging resources and roosting sites to persist. The species is known to use a wide variety of habitats including subtropical and temperate rainforests, tall sclerophyll forest and woodlands, heaths, swamps and also urban and agricultural areas where food trees have been cultivated. The species is highly adaptive with its diverse native diet, which it can supplement with introduced species. It is known to forage within a variety of habitat areas as each resource does not produce food throughout the entire year.

Less than half of the site (8.52 ha) is mapped as containing Least Concern remnant vegetation, with the majority of the site consisting of non-remnant vegetation. *Pteropus poliocephalus* (Grey-headed Flying-fox) was not recorded during site surveys. The site habitat characteristics are considered to provide marginal foraging resources for this species, as follows:

- The vegetation recorded within the majority of the remnant polygon is dominated by *Eucalyptus acmenoides* (White Mahogany) as well as *Corymbia intermedia* (Pink Bloodwood), *Eucalyptus siderophloia* (Grey Ironbark), *Angophora leiocarpa* (Smooth Bark Apple), and scattered *Lophostemon suaveolens* (Swamp Box). Vegetation observed and recorded outside of the mapped remnant polygons are dominated by Acacia species including *Acacia concurrens* (Black Wattle), *Acacia leiocalyx* (Early Flowering Black Wattle), and *Acacia disparrima* (Hickory Wattle).
- It is recognised that foraging by *Pteropus poliocephalus* (Grey-headed Flying Fox) could occur on the application site at various times throughout the year. The following lists the dominant flora species observed throughout the application site and the times at which flowering is expected for each species;
  Corymbia intermedia (Pink Bloodwood) – December to May
  Eucalyptus acmenoides (White Mahogany) – October to February
  Eucalyptus siderophloia (Grey Ironbark) – July to January
  Eucalyptus tereticornis (Forest Red Gum) – June to November
- Similar habitat is found throughout South-East Queensland (including large tracts to the west of the project site) that provide better habitat and foraging opportunities to those found on-site. The habitat present on-site does not contain any unique high value habitat, and it is considered unlikely that individuals would be exclusively reliant on the resources supported by the subject site.

The *Draft EPBC Act Policy Statement – camp management guidelines for the Grey-headed and Spectacled Flying-fox* (Draft Guidelines) summarise the decision process in considering the likelihood of a significant impact on the Grey-headed flying-fox or Spectacled Flying-fox schematically. The Draft Guidelines are specifically for the assessment of impacts on Flying-fox camps. It is considered highly unlikely that the action will involve impacts on the Grey-headed Flying-fox according to the Draft Guidelines. However, the Draft Guidelines also state that:

- *Maintaining a network of flying-fox camps and foraging habitat across both species' national range is important for their recovery.*

- *Actions that will impact on the foraging habitat of EPBC Act listed flying-foxes may also result in a significant impact. This is beyond the scope of this policy.*

As the site contains known potential foraging habitat for the Grey-headed Flying-fox, an assessment against *the Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* was conducted (refer to **Table 7**) to ascertain whether or not the action could potentially impose a significant impact on the species.

Table 7: Significant Impact Assessment – Grey-headed Flying-fox

Significant Impact Criteria	Description	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1. Lead to a long term decrease in the size of an important population of a species.	While the site does contain potential foraging habitat for the Grey-headed Flying-fox, no individuals or roost camps were seen on or adjoining the site. South East Queensland has a permanent and relatively abundant population of Grey-headed Flying-foxes and available habitat is abundant and spread throughout the region given the high prevalence of eucalypts. Although Grey-headed Flying-fox have potential to visit the site when foraging, their recognised nightly commuting distance spans up to 20 km and so includes a relatively vast area of suitable habitat within the surrounding landscape. The proposed quarry expansion site is not considered to support an important population of the species or significant habitat therefore the proposed action is considered unlikely to lead to a long term decrease in the size of any local Grey-headed Flying-fox populations.	**No significant impact likely**
2. Reduce the area of occupancy of an important population.	No roost camps were observed across the site. While the proposed action will remove some potential foraging habitat, given the abundant availability of eucalypts in the surrounding landscape and the greater region, the development proposal is unlikely to have a significant impact on the area of occupancy of the species.	**No significant impact likely**
3. Fragment an existing important population into two or more populations.	The SPRAT species profile outlines that while there are spatially structured colonies of Grey-headed Flying-fox, there are no separate or distinct populations due to the constant genetic exchange and movement between camps throughout the species' geographic range. In addition, the species is considered highly mobile and capable of foraging over relatively vast distances. The proposed action is considered unlikely to fragment a population into two or more populations.	**No significant impact likely**
4. Adversely affect habitat critical to the survival of a species.	The proposed action will result in the removal of some potential foraging habitat, however this habitat is relatively disturbed by existing quarrying activities on-site and neighboring land development and arterial roads, and subject to edge effects from surrounding development. Further, this habitat is not considered to be unique or of special value. The South East Queensland landscape provides abundant eucalypt and similar genera, which are available for Grey-headed Flying-fox foraging. Of note, vegetation in the southern portion of the properties will be retained and will maintain foraging resources post quarry expansion. Given its relatively disturbed nature, potential foraging habitat to be cleared is not considered to be critical habitat for Grey-headed Flying-fox.	**No significant impact likely**
5. Disrupt the breeding cycle of an important population.	The site surveys did not identify any evidence of breeding Grey-headed Flying-fox. Mating normally occurs within autumn, and females generally give birth in October, when they carry their young to feeding sites for four to five weeks after giving birth. As no roosting camps were observed on or adjoining the site, the proposed action is unlikely to disrupt the breeding cycle of an important population.	**No significant impact likely**

6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The habitat on site did not contain any special or unique values. The removal of site vegetation is unlikely to have a significant impact on the availability of habitat throughout the broader landscape, given the vast quantity and availability of eucalypts in the surrounding area.	**No significant impact likely**
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The proposed action is unlikely to result in the introduction of invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	**No significant impact likely**
8. Introduce disease that may cause the species to decline.	The project is unlikely to introduce disease into the area that may cause the species to decline.	**No significant impact likely**
9. Interfere substantially with the recovery of the species.	Recovery of the species has specifically targeted broad scale culling. In addition, conservation efforts have led to the protection of known roosting sites and associated important habitat. The subject site has not been identified as an important habitat or roost site and the action is considered unlikely to interfere with the recovery of the species.	**No significant impact likely**

As per the assessment against the *Significant Impact Guidelines 1.1*, the proposed action is considered unlikely to have a significant impact on the Grey-headed Flying-fox.

In summary, it is considered that the abundance of suitable foraging habitat in the surrounding landscape suggests the retention of vegetation in the south of the properties would likely mitigate any potential negligible impact on Grey-headed Flying-fox. Additionally, the subject site does not contain any high value habitat for this species.

Swift Parrot (*Lathamus discolor*)

Lathamus discolour (Swift Parrot) is considered very distinctive. It undertakes the longest migration of any parrot species in the world, with breeding occurring only in Tasmania and migration to mainland Australia occurring within the wintering months to the box-ironbark forests and woodlands as far north as southeast Queensland. This species has been recorded within woodland and forest patches containing *Eucalyptus crebra* (Narrow Leaf Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), as well as yellow box forests, and it feeds mostly on nectar and mainly from eucalypts. Although records of this species have come from the Gold Coast, Noosa, Toowoomba, Warwick and Lockyer Valley, a search of Wildlife Online for species records does not include *Lathamus discolour* as being observed within a five kilometre radius of the site.

Less than half of the site is mapped as containing Least Concern remnant vegetation, with the majority of the site consisting of non-remnant vegetation. *Lathamus discolour* (Swift Parrot) was not recorded during site surveys. The site habitat characteristics are considered to provide marginal foraging resources for this species, based on the availability of *Eucalyptus tereticornis* (Forest Red Gum).

As the site contains known foraging habitat for the Swift Parrot, an assessment against *the Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* was conducted (refer to **Table 8**) to ascertain whether or not the action could potentially impose a significant impact on the species.

Table 8: Significant Impact Assessment – Swift Parrot

Significant Impact Criteria	Description	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1. Lead to a long term decrease in the size of an important population of a species.	While the site does contain potential foraging habitat for the Swift Parrot, no individuals were seen during the site surveys. Known records of the Swift Parrot come from the Gold Coast, Noosa, Toowoomba, Warwick, and Lockyer Valley. The available habitat is relatively abundant and spread throughout the region given the high prevalence of eucalypts. Although Swift Parrots have potential to visit the site when foraging, they are highly mobile, therefore their regular commuting includes a relatively vast area of suitable habitat within the surrounding landscape.	**No significant impact likely**

	The site is not considered to support an important population of the species and the proposed action is considered unlikely to lead to a long term decrease in the size of any Swift Parrot populations.	
2. Reduce the area of occupancy of an important population.	No individuals or evidence of Swift Parrots were observed on-site. While the proposed action will remove some potential foraging habitat, given the abundant availability of eucalypts in the surrounding landscape and the greater region, the development proposal is unlikely to have a significant impact on the area of occupancy of the species.	**No significant impact likely**
3. Fragment an existing important population into two or more populations.	The SPRAT species profile outlines that the Swift Parrot population occurs as a single population, although it migrates annually. The population is not considered to be fragmented or separated. During non-breeding times, their movements cover hundreds of kilometres. The proposed action is considered unlikely to fragment a population into two or more populations.	**No significant impact likely**
4. Adversely affect habitat critical to the survival of a species.	While the proposed action results in the removal of some potential foraging habitat, this habitat is relatively disturbed by clearing and existing quarry operations, and subject to edge effects from surrounding development. The SPRAT species profile further states that while the Swift Parrot habitat is fragmented, it has not caused the populations to fragment, due to their highly mobile lifestyles. Further, the habitat on-site is not considered to be unique or of special value. The South East Queensland landscape provides abundant eucalypt and similar genera, which are available as food sources for the Swift Parrot. Additionally, the retention of vegetation in the southern portion of the site will maintain foraging resources post-expansion. Given its relatively disturbed nature, potential foraging habitat to be cleared is not considered to be critical habitat for Swift Parrot.	**No significant impact likely**
5. Disrupt the breeding cycle of an important population.	The Swift Parrot breeds in Tasmania, therefore the proposed action will have no impact on the breeding cycle of an important population.	**No significant impact likely**
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The habitat on-site did not contain any special or unique values. Its removal is unlikely to have a significant impact on the availability of habitat throughout the broader landscape, given the vast quantity and availability of eucalypts in the surrounding area. The removal of a small area of foraging habitat on-site is not likely to lead to species decline.	**No significant impact likely**
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The proposed action is unlikely to result in the introduction of invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	**No significant impact likely**
8. Introduce disease that may cause the species to decline.	The project is unlikely to introduce disease into the area that may cause the species to decline.	**No significant impact likely**
9. Interfere substantially with the recovery of the species.	Recovery of the species has specifically focused on identifying extent and quality of habitat; managing habitat at the landscape scale; reducing incidents of collision; population and habitat monitoring; community education and information; and managing the recovery process. The subject site has not been identified as an important habitat or population and the action is considered unlikely to interfere with the recovery of the species.	**No significant impact likely**

As per the assessment against the *Significant Impact Guidelines 1.1*, the proposed action is considered unlikely to have a significant impact on the Swift Parrot.

In summary, it is considered that the abundance of suitable foraging habitat in the surrounding landscape suggests the retention of vegetation in the southern portion of the property would likely mitigate any potential negligible impact on Swift Parrot.

Nature and extent of likely impact

Except for evidence of Koala activity in the form of scats and scratches, no other EPBC Act listed species were observed on-site or in areas adjoining the site. As stated above, it is considered that the abundance of suitable foraging habitat in the surrounding landscape suggests the retention of vegetation in the southern portion of the properties under the proposed expansion would likely mitigate any potential negligible impact on these species, should they visit the site.

With respect to the Koala, targeted field surveys as per EPBC Act guidelines completed across the site resulted in no Koala observations on or surrounding the referral area. While SAT surveys found "Medium" to "High" evidence of usage on-site by the Koala, the site is completely fragmented from surrounding vegetation and does not provide any connectivity value. Critical habitat on the site was given a habitat assessment score of 5 under the Koala Referral Guidelines, which is the lowest score for "critical habitat".

In terms of impacts on MNES, the project will result in the following:

- Removal of 16.5 hectares of critical habitat for the Koala (**Plan 2**);
- Potential injury or death to Koalas as a result of vegetation clearing; and
- Increased vehicle use during and after construction, which pose potential threats to Koalas.

As discussed above, a number of factors diminish the adversity of impacts caused by the proposed clearing of 16.5 hectares of critical habitat. These factors can be summarised as:

- The proposal requires the clearing of approximately 16.5 ha of habitat of variable quality, with approximately half the area as non-remnant vegetation, and only limited primary Koala food tree species were found;
- 16.5 ha is considered a smaller area of habitat (<20 ha);
- The habitat score of 5 for the site is the lowest range score for "critical habitat";
- The surrounding area is highly urbanised and contains a number of dogs which likely utilise the site at times;
- No Koalas were observed on-site – only evidence of Koala activity in the form of scats and scratches was recorded;
- Clearing will not result in fragmentation of a habitat area from a larger habitat area, as this site forms a completely isolated and relatively disturbed patch of vegetation, surrounded on all sides by various forms of development including major arterial roads; and
- Vegetation clearing will be undertaken sequentially under the guidance of a fauna spotter-catcher. This will ensure that the potential for injury or death to Koalas, if present, as a result of clearing is minimised. Additionally, any Koalas found on-site will be relocated to an area with more suitable habitat, and a lower chance of mortality.

As such, the proposal is considered unlikely to impose a significant impact on any MNES, including the Koala.

3.1 (e) Listed migratory species

Description

An EPBC Act Protected Matters Search Tool with a two kilometre radius identifies 13 migratory species as having potential to occur on-site (**Attachment 1**). None of these listed migratory species were observed during the field survey. Optimal habitat for these species and the other listed migratory species was considered lacking on-site (**Attachment 2 – Appendix D**).

Nature and extent of likely impact

The proposed action is not considered to have a significant impact on migratory species given the lack of significant habitat on-site.

3.1 (f) Commonwealth marine area
(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

Description
Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

3.1 (g) Commonwealth land
(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

Description
Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

3.1 (h) The Great Barrier Reef Marine Park

Description
Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

3.1 (i) A water resource, in relation to coal seam gas development and large coal mining development

Description
Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

3.2 (a)	**Is the proposed action a nuclear action?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	**X**	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment	

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))		

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))		

3.2 (e)	**Is the proposed action to be taken in the Great Barrier Reef Marine Park?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))		

3.3 Other important features of the environment

3.3 (a) Flora and fauna

The following provides a brief description of other flora and fauna values found on-site during desktop and field surveys:

Flora

The proposed development area is highly modified due to existing quarrying occurring on the site, and surrounding land use and development (refer **Response 3.3(g)**). The application area contains remnant Least Concern Regional Ecosystem communities and non-remnant areas. Exotic and weed species were prevalent in the ground and shrub layers of the vegetation. Vegetated areas were uniform in density and age structure, with only mild variations occurring in tree species dominance and co-dominance.

No threatened flora species under the EPBC Act or NCA were observed on-site. Further, the TEC considered as having the potential to occur on-site was not recorded. Due to previous and continuing disturbances, it is unlikely that the subject site has or will support listed flora species and TECs.

Eighty-one flora species were identified across the whole property. Forty-nine of the flora species recorded are native to the local area, with the 32 of the species being introduced and dominating the shrub and ground layers. Refer to **Attachment 2** for a full description of the flora on-site. Seven of the observed weed species are classified as declared weeds under the *Land Protection (Pest and Stock Route Management) Act 2002*.

Other Vegetation

Queensland's Regulated Vegetation Management Map shows the site contains patches of Category B Remnant Vegetation. This vegetation was confirmed on-site to be RE12.9-10.17 (refer to **Attachment 2 – Figure 4**). The on-site area of RE 12.9-10.17 is 8.52 ha, with the remaining area non-remnant vegetation. The ground layer is generally comprised of a combination of native and exotic grass species. *Angophora leiocarpa* (Smooth Bark Apple), *Eucalyptus acmenoides* (White Mahogany), *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus siderophloia* (Grey Ironbark), and *Corymbia intermedia* (Pink Bloodwood) and Acacia species were present at varying densities across the site.

Despite targeted searches as per EPBC Guidelines (refer Response **3.1(d)**), no threatened flora species listed under the EPBC Act were recorded during field studies.

Due to past and present land use practices, the site contained a high abundance of invasive weeds, with a total of 32 weed species observed on-site. Species observed included seven *Queensland Land Protection (Pest and Stock Route Management) Act 2002* listed weeds - *Asparagus africanus* (Climbing Asparagus Fern), *Baccharis halimifolia* (Groundsel Bush), *Celtis sinensis* (Chinese Elm), *Cinnamomum camphora* (Camphor Laurel), *Lantana camara* (Lantana), *Schinus terebinthifolius* (Broadleaved Pepper Tree), and *Spagneticola trilobata* (Singapore Daisy). Other disturbances included significant vegetation clearing for the existing quarry operation, associated access tracks, and easements. Surrounding land uses have also resulted in vegetation clearing for residential and commercial developments. Additionally, there are a number of cleared easements across the property. Refer to **Attachment 2** for more detail.

Fauna

Some remnant vegetation specimens retained tree hollows and habitat to potentially support small mammals, microbats and some bird species. At the time of the assessment, the most common species observed utilising the hollows were *Trichoglossus moluccanus* (Rainbow Lorikeets). It is noted that the vegetation observed on the southern side of the power easement (which will not be impacted by the proposed quarry expansion) contained a number of very large trees containing large hollows. Although no obvious signs of use at the time of the assessment, these hollows retain the possibility of potential habitat for similar species.

No Koala sightings were recorded within the proposed development area. Koala habitat and usage assessments as per EPBC Act Guidelines found Low evidence of Koala usage.

Due to the residential and rural properties surrounding the site, it can be assumed that dogs use the surrounding areas, and may also utilise the site. Dogs are generally considered detrimental to native fauna persistence.

Despite searches as per EPBC Act Guidelines (refer Response **3.1(d)**), no threatened fauna species listed under the EPBC Act were recorded during field studies.

The site's ability to support listed threatened fauna species, which are generally highly sensitive, specialised, and require particular habitat features, is highly unlikely for the majority of the listed EPBC Act or NCA protected species. Utilisation of the site is limited to fauna that can adapt to a highly modified and disturbed landscape containing anthropogenic influences. Overall, one amphibian, 18 bird, one mammal, and three reptile species were recorded on-site (refer to **Attachment 2 – Table 6**). With the exception of the Koala evidence, stratified log, leaf litter, and habitat searches did not reveal any listed threatened species utilising the site. The vast majority of fauna species recorded on-site are considered common to the local area.

3.3 (b) Hydrology, including water flows

A regulated vegetation watercourse is mapped in the north of the property. This watercourse does not connect to any other mapped watercourse. The mapping and aerial imagery shows the watercourse to be a singular, fragmented section (refer to **Section 3.1(c)** above), beginning approximately 200 m to the west of the site, and finishing approximately 180 m to the north of the site. Any overland flow across the site due to soil saturation during high rainfall events is likely to run into this drainage feature.

3.3 (c) Soil and Vegetation characteristics

Vegetation values across the site are limited due to clearing for the existing quarry and previous land uses. Vegetation is a mixture of patches of remnant vegetation and regrowth of compromised habitat value. Remnant vegetation was confirmed as Least Concern RE 12.9-10.17.

The Australian Soil Resource Information System (ASRIS) maps the site as containing Dermosols. Dermosols do not have strong texture contrast. They have a well-structured B2 horizon containing low levels of free iron. The parent materials of dermosols range from siliceous, intermediate to mafic in composition.

Dermosol soils are found in imperfectly drained sites (yellow and grey dermosols) with rainfall between 550 mm and 1350 mm and in well-drained sites with rainfall between 450 mm and 1200 mm. Dermosols generally have high

agricultural potential with good structure and moderate to high chemical fertility and water-holding capacity with few problems.

Refer to Attachment 2 – Figure 7.

3.3 (d) Outstanding natural features

No outstanding natural features have been identified across the site. In particular, the site's location immediately adjacent to Old North Road and Kremzow Road, and surrounded by cleared lands has fragmented it from other habitat areas in the landscape. Previous disturbances in the greater local area have significantly reduced the ecological value of the site and no outstanding natural features can be identified.

3.3 (e) Remnant native vegetation

Four small fragmented patches of Category B Least Concern remnant Regional Ecosystem (RE) exist on the proposed site. These patches were confirmed by field assessment to be Least Concern RE12.9-10.17. This Regional Ecosystem is not considered essential habitat for threatened species.

3.3 (f) Gradient (or depth range if action is to be taken in a marine area)

The natural site contours contain a peak in the far west (west of the existing quarry), and a peak in the east, with more low lying areas in the centre of the site. The total contour variation is approximately 30 metres.

3.3 (g) Current state of the environment

The site was found to be largely disturbed as a result of existing quarry activities in the central portion of the property, maintained clearing for easements, invasion from exotic weeds, and adjacent land clearing. The majority of site vegetation is regrowth following clearing for previous land uses.

More than half of the site is classified as Category X non-remnant vegetation, under the VMA (refer **Attachment 2 – Figures 3** and **4**). None of the site vegetation is classified as an Endangered or Of Concern Regional Ecosystem, or as Essential Habitat. The site contained a number of recognised pest weeds including state declared weed species, *Asparagus africanus* (Climbing Asparagus Fern), *Baccharis halimifolia* (Groundsel Bush), *Celtis sinensis* (Chinese Celtis), *Cinnamomum camphora* (Camphor Laurel), *Lantana camara* (Lantana), *Schinus terebinthifolius* (Broadleaf Pepper Tree), and *Spagneticola trilobata* (Singapore Daisy).

The site in its current condition is not considered to provide any unique habitat features or values to the broader landscape. The presence of some flowering eucalypt trees which provide potential foraging habitat for the Swift Parrot and the Grey-headed Flying-fox is not considered significant within the broader landscape and habitat availability.

In addition, contextually, the site is situated in a highly fragmented landscape, with an existing quarry on the property, completely cleared land immediately to the west, roads to the east and north, and easements to the south and within the site.

Refer to **Attachment 2** for further results of the site assessment.

3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

Not applicable (refer to **Attachment 1 – PMST Results**).

3.3 (i) Indigenous heritage values

There are no known cultural heritage values on the site.

3.3 (j) Other important or unique values of the environment

The site is not located near other notable environmental features that are likely to be affected by the proposed action.

3.3 (k) Tenure of the action area (eg freehold, leasehold)

The entire extent of the site is freehold land.

3.3 (l) Existing land/marine uses of area

The site is currently under quarrying operations in the central portion, and unused in the proposed expansion areas. There are a number of easements on the property. Surrounding land uses are rural residential, residential development, commercial development, and arterial roads.

3.3 (m) Any proposed land/marine uses of area

The proposed use of the land is to expand the existing quarry, as per the zoning intent of "Extractive Industry".

4 Environmental Outcomes

The Kremzow Road quarry expansion development will result in the removal of Koala habitat trees from the site area to enable completion of the expansion. As highlighted throughout this referral document, the vegetation on-site is impacted and fragmented by previous land uses, and surrounding roads and residential developments. While evidence of Koala on-site was located during the site survey, this occurrence is limited by the current and planned developments on surrounding lands, and the zoning intent of the subject site. Based on this context, while the property contains Critical Habitat, this is fragmented and will continue to become more so with encroaching development, thus is not considered to result in a Significant Impact on a Matter of National Environmental Significance.

Further, a number of environmental management mitigation measures will be developed and implemented for the quarry expansion, including (but not limited to):

- Fauna Management Plan;
- Vegetation Management Plan;
- Preclearing Fauna Assessment & Management Plan; and
- Environmental Area Rehabilitation and Management Plan.

On a local scale, the retention of vegetation on the southern portion of the site contains Least Concern RE 12.9-10.2 and Endangered RE 12.3.11, and a mapped watercourse. The retention of this area will provide continuation and enhancement of the compromised environmental values and functions.

A Rehabilitation Plan will be developed for the whole site as part of the development. The overarching purpose of this Plan will be to protect and retain existing vegetation (i.e. in the southern portion of the site), and rehabilitate and stabilise outer areas of the quarry and batters where required. All restoration and rehabilitation works will be conducted in accordance with best management practices, including assisting to stabilise and reverse negative effects of habitat fragmentation.

The preservation of the southern portion of the property under the proposal is considered to provide a noteworthy environmental outcome for the threatened species that may infrequently utilise the site as part of a broader home range. This assessment has determined that this development will not have a significant impact on any listed species under the EPBC Act. Specifically regarding the Koala, the site was assessed to not have a significant impact on the Koala due to the low amount of Critical Habitat of a low score to be cleared, existing threats to the Koala in the area, and the lack of potential impact on the recovery of the Koala, and we consider that the action should be made Not a Controlled Action.

Should the Department disagree with this decision and consider the action a Controlled Action, a draft set of outcomes based conditions for the Kremzow Road Quarry Expansion will be prepared in accordance with DoE's draft Outcomes-based Conditions Policy 2015 and Outcomes-based Conditions Guidance 2015.

5 Measures to avoid or reduce impacts

The primary impact on the natural environment as a result of the project is the clearing of native trees (both mature and regrowth) within patches of non-remnant and remnant vegetation. A number of management measures will be employed during clearing and establishment of the expansion that firstly avoid environmental impacts, and if not avoidable, reduce, minimise, and mitigate the environmental impacts. These measures will be put in place to comply with Boral CSR Bricks Pty Ltd's internal environmental policies, and to meet Boral CSR Bricks Pty Ltd's environmental duty of care. Management measures that will be included are summarised below:

1. Vegetation Management Plan

A Vegetation Management Plan including information on:

- Location of protected vegetation, vegetation to be retained and vegetation to be removed;
- Details on vegetation types;
- Location of significant vegetation (remnant vegetation, city wide significant species etc.);
- Particulars on how vegetation is proposed to be cleared (clearing sequence plan);
- Methods for protecting or relocating plants; and
- Disposal methods.

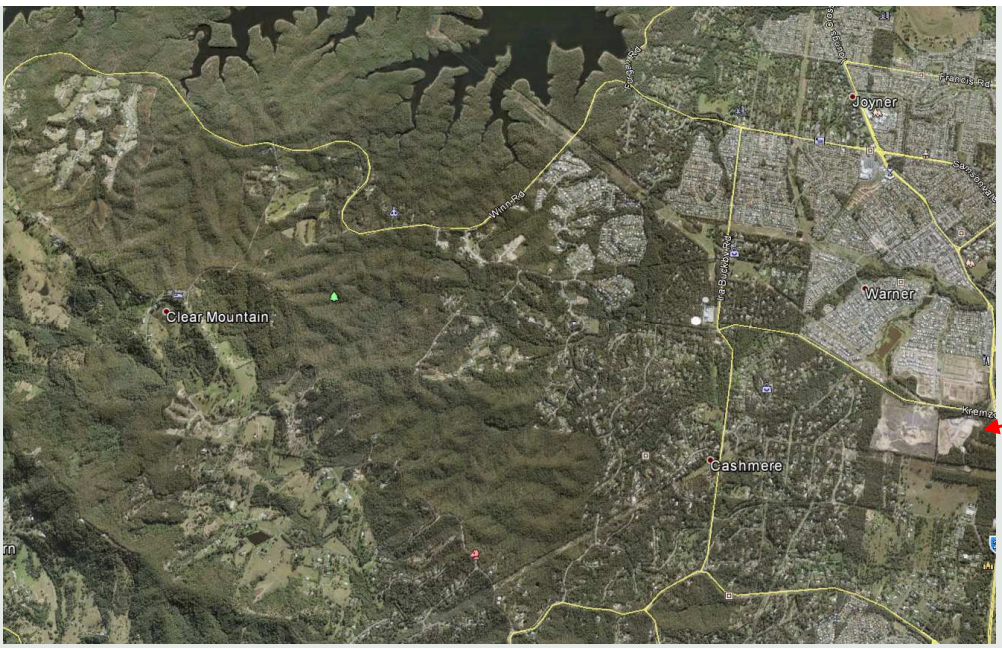
2. Fauna Management Plan

All works will be undertaken in accordance with a site Fauna Management Plan. This Plan will include details on:

- Species surveyed as using the site;
- A plan showing existing habitat areas;
- Details of threats to existing fauna;
- Clearing sequence plan;
- Management and mitigation measures - e.g. temporary fauna exclusion fencing;
- Fauna spotter role, contacts and certification, as well as a trained and approved Koala spotter catcher;
- A plan for the translocation of any Koalas found on-site; and
- Specific fauna management procedures for potential or known habitat trees.

It should also be noted that Clear Mountain (approximately 3 km to the west of the site – see aerial below) provides a large area of good quality habitat that would be suitable to receive fauna encountered during site works that need to be translocated.

Boral CSR has successfully carried out koala translocations previously on other sites in consultation with and assisted by the Queensland Department of Environment and Heritage Protection. If a koala (or any other fauna) was required to be moved from the site a Wildlife Movement Permit would applied for under the *Nature Conservation Act 1992*. As part of the permitting process a licensed fauna handler is required to be nominated to undertake the activity.



3. Stormwater Management Plan

All works will be carried out and completed in accordance with a Stormwater Management Plan which will provide details on:

- Stormwater quality improvement devices; and
- Mechanisms for monitoring and reporting.

The implementation of the Stormwater Management Plan will ensure that water quality standards set by State and Local governments are achieved.

4. Erosion and Sediment Control Plan

An Erosion and Sediment Control Plan will be implemented which will contain details on:

- Catchment boundary and overland flow path;
- Estimated soil loss from each catchment;
- Length, width and depth of each sediment basin;
- Spillway details and levels;
- Energy dissipation/ scour protection;
- High flow bypass;
- Cross section, capacity and spacing of each catch/ diversion drain;
- Location and spacing of silt fences;
- Frequency and location of water quality monitoring;
- Maintenance requirements and frequency;
- Maintenance access; and
- Contingency measures in case of failure to achieve water quality objectives.

Rehabilitation Plan

A Rehabilitation Plan will be included within the Plan of Operations. The Rehabilitation Plan will relate to the balance areas surrounding the site. This will be accomplished by:

- The removal of extensive weed infestations and the suppression of weedy regrowth as required;
- Stabilisation of any erosion prone areas with weed matt and mulching;
- The encouragement of native plant regeneration; and
- The establishment of recognised Koala habitat trees, as required.

Mitigation of impacts on the Koala

The project will result in the removal of 16.5 hectares of critical habitat for the Koala. A number of factors diminish the adversity of impacts caused by the proposed clearing of critical habitat. These factors can be summarised as:

- The proposal requires the clearing of approximately 16.5 ha of habitat of variable quality, with approximately half the area is non-remnant vegetation, and limited primary Koala food tree species were found;
- 16.5 ha is considered a smaller area of habitat (<20 ha);
- The habitat score of 5 for the site is the lowest score for "critical habitat";
- Retention of vegetation in the southern portion of the site will continue to provide connectivity values through the landscape and ensuring long-term habitat viability should Koalas utilise the area;
- Given the number of residential areas around the site, it is likely that dogs currently utilise the surrounds, and potentially the site;
- No Koalas were observed on-site – only evidence of Koala activity in the form of scats and scratches was recorded;
- The vegetation in the southern portion of the properties is to be retained;
- Clearing will not result in fragmentation of a habitat area from a larger habitat area, as this site is entirely isolated from surrounding vegetation by easements, roads, and cleared lands on all sides; and
- Vegetation clearing will be undertaken sequentially under the guidance of a fauna spotter-catcher. This will ensure that the potential for injury or death to Koalas, if present, as a result of clearing is minimised.

Summary

Each of the above mentioned management measures are specifically aimed at avoiding and reducing impacts on the natural environment as a result of the proposed development. In particular, the use of a fauna-spotter catcher during clearing and construction phases will ensure that impacts to Koalas, if present, are avoided.

6 Conclusion on the likelihood of significant impacts

6.1 Do you THINK your proposed action is a controlled action?

X	No, complete section 6.2
	Yes, complete section 6.3

6.2 Proposed action IS NOT a controlled action.

The construction and operational phases of the Kremzow Road Quarry Expansion are not considered to have a significant impact on Matters of National Environmental Significance (MNES) and as such, do not warrant a 'controlled action' determination. As detailed in this referral, no MNES are considered to be impacted by the proposal. In particular, the project is not considered to have a significant impact on Koalas as a result of the clearing of vegetation due to the following conclusions:

- No Koalas were observed on-site;
- The site is completely fragmented from surrounding bushland areas;
- Vegetation is to be preserved in the southern portion of the property; and
- Critical Habitat on the site achieved the lowest score for Critical Habitat (score of 5) using the Koala Referral Guidelines Habitat Assessment Tool, and multiple characteristics that reduce adverse effects to habitat critical to the survival of the Koala are evident suggesting that referral is not recommended.

Management measures will be implemented to ensure that injury to Koalas, if present, as a result of vegetation clearing is avoided. This will include the use of a fauna spotter-catcher during all stages of clearing and the implementation of sequential clearing to allow fauna to disperse away from clearing areas.

Given these factors, it is unlikely that the proposed action will have a significant impact on MNES and as such, is **not considered to be a controlled action**.

6.3 Proposed action IS a controlled action

Not applicable

7 Environmental record of the responsible party

		Yes	No
7.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** **Provide details** Boral CSR Bricks is a new joint venture and as such does not have an environmental history. However, prior to the joint venture taking control of the quarry it was operated by Boral for over 20 years and in that time has not had a single known environmental non-conformance notice.	**X**	
7.2	**Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** **If yes, provide details**		**X**
7.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** **If yes, provide details of environmental policy and planning framework** Boral CSR Bricks Health, Safety and Environment policy is included as **Attachment 3**.	**X**	
7.4	**Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?** **Provide name of proposal and EPBC reference number (if known)** Boral CSR Bricks Pty Ltd has not referred any other actions under the EPBC Act. Other business entities within Boral and CSR have several referrals. Details have not been provided in this referral however can be found within the EPBC Act referral database.		**X**

8 Information sources and attachments

(For the information provided above)

8.1 References

- **Australian Koala Foundation**, *The Spot Assessment Technique: determining the importance of Habitat Utilised by Koalas (Phascolarctos cinereus)*, available online https://www.savethekoala.com/sites/default/files/docs/conserve/The%20Spot%20Assessment%20Technique.pdf

- **Australian Koala Foundation** 2012, *National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat*.

- **Australian Soil Resource Information System**, http://www.asris.csiro.au/

- **McAlpine, Callaghan, Lunney, Bowen, Rhodes, Mitchell & Possingham** 2006, *Conserving Southeast Queensland Koalas: How much habitat is enough? In: Biodiversity Conference Proceedings (eds G. Siepen and D. jones), pp 11-17, University of Queensland, Gatton.*

- **Phillips & Callaghan** 2011, *The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus*. ***Australian Zoologist 35(3)****: 774-780.*

8.2 Reliability and date of information

Refer to response at 8.1

8.3 Attachments

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	- Project locality – Figures 1 & 2 - GIS file - Plan 1 – Proposed Quarry Expansion Plan
	GIS file delineating the boundary of the referral area (section 1)		
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	- Project locality - Figures 1 & 2 - Figure 3 – Vegetation Fragmentation
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.5)	N/A	
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)	N/A	
	copies of any flora and fauna investigations and surveys (section 3)	✓	- Attachment 1 – Protected Matters Search Results - Attachment 2 – Ecological Assessment Report - Plan 3 – Field Survey Effort
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 5)	✓	- Attachment 2 – Ecological Assessment Report - Plan 2 – Critical Habitat - Plan 3 – Field Survey Effort - Figure 3 – Vegetation Fragmentation - Attachment 3 – Example Fauna Management Plan
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)	N/A	

9 Contacts, signatures and declarations

Project title: Kremzow Road Quarry Expansion

9.1 Person proposing to take action

1. Name and Title:	Sean Barry Ventris Secretary
2. Organisation:	Boral CSR Bricks Pty Ltd
3. EPBC Referral Number:	N/A
4: ACN / ABN:	68 168 794 821
5. Postal address:	PO Box 125, Kelvin Grove DC, QLD 4059
6. Telephone:	
7. Email:	dcarnovale@csr.com.au
8. Name of designated proponent (if not the same person at item 1 above:	As above
9. ACN/ABN of designated proponent (if not the same person named at item 1 above):	As above
I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:	N/A
If you are small business entity you must provide the Date/Income Year that you became a small business entity:	N/A
I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations. Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made:	N/A

Declaration	I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct. I understand that giving false or misleading information is a serious offence. I agree to be the proponent for this action. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.
Signature	SEAN BARRY VENTRIS
Date	15/06/2016

9.2 Person preparing the referral information (if different from 9.1)

Name	**Sam Maynard**
Title	**Senior Environmental Scientist**
Organisation	**Saunders Havill Group Pty Ltd**
ACN / ABN (if applicable)	**24 144 972 949**
Postal address	**9 Thompson Street, Bowen Hills, QLD 4006**
Telephone	**(07) 3251 9434**
Email	**sammaynard@saundershavill.com**
Declaration	I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct. I understand that giving false or misleading information is a serious offence.
Signature	
Date	15/06/16