

WOLFFDENE QUARRY EXTENSION – EPBC 2014/7384 Preliminary Documentation

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1. Introduction

1.1 Proposed Action and Designated Proponent

The proposed action is the extension of the existing Wolfdene Quarry (the existing quarry) at Luscombe, Queensland onto adjacent land being described as Lot 2 RP15903, Lot 2 RP813599, Lot 67 WD1009 and Lot 80 CP893560 (the extension land). The designated proponent for the proposed action is Hanson Construction Materials Pty Ltd (Hanson). The site is located in the Gold Coast City Council (Council) area at 145 Harts Road, Luscombe, QLD, 4027, approximately 6.5km south of the centre of Beenleigh (refer Drawing No. 1001.286 – Site Location Plan).

The existing quarry is located within Lot 1 CP893562, Lot 2 RP167150 and Lot 1 CP893559 (refer Drawing No. 1001.287 – Hanson Land Holdings). The existing quarry operates pursuant to a number of historical approvals including a rezoning and consent granted by the former Albert Shire Council in 1981 and an Environmental Authority granted by the Queensland government in 1996 and amended in 2000. The particulars of those historical approvals and the qualification as a prior authorisation for the purposes of Section 43A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are discussed in detail in Section 7 of this report. The existing quarry uses typical hard rock quarrying methodologies which would continue in the proposed action.

Importantly, the volume and type of quarry materials, haulage volumes (truck numbers), processing output, stockpiling and product distribution will not change as a result of the proposed action. To be clear, the proposed action relates only to the extension of the existing quarry onto the adjacent land at Lot 2 RP15903, Lot 2 on RP813599, Lot 67 WD1009 and Lot 80 CP893560 (refer Drawing No. 1001.287 – Hanson Land Holdings). The proposed action relies upon the broader land holdings under the control of Hanson (refer Drawing No. 1001.287 – Hanson Land Holdings) which provide additional buffer land and are proposed to be provided as environmental offsets.

The proposed action has been refined from time to time and further refinements occurred to address matters of national environmental significance reducing the proposed extraction footprint and increasing the area of land for environmental offsets (refer Drawing No. 1001.285 – Proposed Action).

1.2 Assessment Process

A referral under the EPBC Act for the proposed action was lodged with the Department of the Environment (DotE) in November 2014 and was acknowledged by the DotE by letter dated 20 November 2014. On 15 December 2014 the proposed action was determined to be a controlled action under the EPBC Act requiring further assessment subject to the controlling provisions 'listed threatened species and communities (section 18 & 18A)'. Subsequently, DotE advised that the proposed action would be assessed by preliminary documentation. On 5 January 2015 the DotE advised the proponent of the further information required to enable the DotE to assess the relevant impacts of the proposed action.

In July 2015 the proponent submitted Preliminary Documentation to the DotE. Subsequently, on 20 July 2015 the DotE advised the proponent to publish the submitted Preliminary Documentation for public comment. The public comment period commenced on 31 July 2015 and concluded on 17 August 2015. Two letters of comment were received during the public comment period. The proponent considered the matters raised during the notification period and provided a summary and response regarding the public comments to the DotE by letter dated 28 August 2015. The DotE reviewed the summary and response provided by the proponent and by email dated 23 September directed that information be included in a revised Preliminary Documentation report and resubmitted to the DotE for consideration. This document is the revised Preliminary Documentation requested by the DotE.

At a State government level, the proposed action is subject to assessment pursuant to the *Sustainable Planning Act 2009* (SPA) and the *Environmental Protection Act 1999* (EP Act). A development application for a material change of use under SPA was lodged with the Council and is currently in the decision making stage of the development assessment process. Concurrent with the development application to Council an application was made to the Department of Environment and Heritage Protection for an Environmental Authority (EA) under the EP Act which was subsequently granted on 12 December 2014.

1.3 Purpose of This Report

The purpose of this revised Preliminary Documentation report is to incorporate the summary and response to matters raised by public comments during the notification period which occurred in July and August 2015 and provide (in combination with the referral previously submitted) preliminary documentation with regards to the proposed action addressing the matters raised in the DotE request for additional information.

2. Description of the Environment and Matters of National Environmental Significance

2.1 Current Land Use

The current land use of the site is the existing quarry within Lot 1 CP893562, Lot 2 RP167150 and Lot 1 CP893559, whereas the remaining land holdings under the control of Hanson are used temporarily for cattle grazing or buffer lands whilst awaiting resolution of relevant approvals and authorisations for the proposed action. Adjoining properties are used for a variety of activities. Land to the south and west is primarily rural. Land to the east constitutes two (2) existing quarries. Land to the north is identified as future industrial land by the current and draft planning scheme of the Council. It should be noted that Lot 69 on RP865173 to the south east of the site is identified as a Nature Refuge (No. 701527699 dated 03/09/1996) being 'estate in fee simple' owned by the Public Trustee of Queensland.

2.2 Topography and Flooding

The site comprises elevations between 20m AHD to 280m AHD (refer Drawing No. 1001.284 – Aerial Photography, Topography and Cadastral Plan). The site consists of rugged hilly terrain in the east, south and north whilst the areas on the west are of a more gentle relief and less incised nature. The northern, southern and eastern landforms are characterised by steep slopes and gullies. The slopes of these upper flanks of the ridges are steep to very steep while the lower flank slopes are generally moderately inclined. The Council's planning scheme does not identify the site as being flood prone and this is unlikely to change as a result of the proposed action.

2.3 Matters of National Environmental Significance

The following section provides a description of the matters of national environmental significance (MNES), identified by the DotE request for additional information as follows:

- Koala (*Phascolarctos cinereus* – combined populations of Queensland, NSW and ACT) - Vulnerable
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – Vulnerable
- Mary River Cod (*Maccullochella mariensis*) – Endangered
- Macadamia Nut (*Macadamia integrifolia*) – Vulnerable
- Ormeau Bottle Tree (*Brachychiton* sp. Ormeau) – Critically Endangered
- Shaggy-haired Cockspur Flower (*Plectranthus habrophyllus*) – Endangered
- Spiny Gardenia (*Randia moorei*) – Endangered
- Native Jute (*Corchorus cunninghamii*) – Endangered.

The following are addressed for each of the above identified MNES:

- Quantification of the extent of habitat (hectares and/or number of individuals) present within the development site.
- Details of the quality of this habitat.
- Information detailing known populations (and records), or high quality habitat for the relevant matter(s) within five kilometres of the development site.
- Information about the resources used to identify and assess the environmental values of the site, and whether consultation or advice was sought from local community groups or flora experts in regard to the potential presence of threatened plant species.
- Where uncertainty exists around the extent of habitat and/or number of individuals of threatened species that occur in the project area, details of how this uncertainty has been taken into account in the impact assessment.

It should be noted that the following information is primarily drawn from the EPBC Technical Report Terrestrial Ecology Assessment (the TEA), dated September 2014, prepared by Gondwana Ecology Group (Gondwana) submitted as part of the referral of the proposed action and supplemented by further liaison with Gondwana on specific matters. For ease of reference certain figures from the TEA are provided as direct attachments to this report as follows:

- Figure 5 Vegetation Communities (refer Attachment 1 - Gondwana Ecology Group Figure 5 Vegetation Communities)
- Figure 6 Threatened Flora Locations and Potential Habitat (refer Attachment 2 - Gondwana Ecology Group Figure 6 Threatened Flora Locations and Potential Habitat)

- Figure 8 Threatened Fauna Locations and Potential Habitat (refer Attachment 3 - Gondwana Ecology Group Figure 8 Threatened Fauna Locations and Potential Habitat)

2.3.1 Koala

A number of comprehensive surveys over many years (2008, 2013, 2014 and 2015) has failed to record (visual) a Koala within the area to be cleared. Evidence (scat) of Koala has been recorded within the extension land. Evidence and expert opinion suggests that it is possible the local landscape supports a single animal and that this area is not necessarily core habitat but marginal.

It is noted that the EPBC Act referral guidelines for the vulnerable Koala defines koala habitat as, '*any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees. This can include remnant and non-remnant vegetation in natural, agricultural, urban and peri-urban environments. Koala habitat is defined by the vegetation community present and the vegetation structure; Koalas do not necessarily have to be present.*'

The Queensland State Wildlife database reports a single Koala record (since 1980) within 1km from the development site. When the search radius is expanded to 5km (incorporating larger patches of bushland and alluvial flats associated with Albert River) only 76 records for Koala are reported. Across the Gold Coast (and surrounds) a reported 775 Koalas have been rescued since 2010 (Wildcare records). There are two records for Yatala (one near the Pacific Motorway and the other near Jacobs Well Road, both well to the east of the development site) since 2000 and no records for Wolfdene or Luscombe (i.e. located near the project site) since 2000. Stanmore Road (to the north of the development site) is a relatively busy road connecting towns and suburbs in the west with the Motorway and services the local industrial estates. The lack of Koala records (i.e. rescues/fatalities) provides some indication that this species is not common in this area.

The Queensland Regulated Vegetation mapping identifies remnant vegetation and non-remnant areas within the development site. The majority of vegetation within the area is mapped as open eucalypt forests comprising of RE 12.11.5 and 12.11.3. Both of these REs are identified as 'least concern' regulated vegetation. Certain regional ecosystems are identified as 'mandatory' for this species, including 12.11.5 which is mapped across a large proportion of the development site and the local landscape. This RE is a mandatory essential habitat factor for koala, regardless of quality of habitat or physical records of the species.

RE 12.11.5 is mapped across the majority of the area and comprises an open forest complex in which *Corymbia citriodora* is relatively common along with *Eucalyptus siderophloia* and occurs on hills and ranges of metamorphics and interbedded volcanics. *Lophostemon confertus* is often present in gullies and as a sub canopy tree. RE 12.11.3 is mapped along gully lines and comprises an open forest generally with *Eucalyptus siderophloia*, *E. propinqua* +/- *E. microcorys*, *Lophostemon confertus*, *Corymbia intermedia* on metamorphics and interbedded volcanics.

The extension land is characterised by a mixed open sclerophyll forest dominated by *Corymbia citriodora* (Spotted Gum) along ridges and upper slopes. *Lophostemon confertus* (Brushbox) and the occasional *Eucalyptus propinqua* (Grey Gum) are more dominant on the lower slopes. Brushbox is the dominant canopy species along the drainage lines. The majority of drainage lines are heavily disturbed with modified understorey and groundcover often dominated by weed species with some rainforest understorey species occurring in the confines of the gully. A small forested community associated with the waterway occurs in the southwest; however, this area is heavily impacted by active grazing. This area provides large *E.tereticornis* on alluvial soils. The forested community and alluvial *E.tereticornis* grassland is not proposed for clearing. Therefore, potential habitat (based on suitable food trees) for this species occurs throughout the landscape and extension land. Land associated with the lower slopes and flat country (associated with the waterway and farmland in the west) is considered preferred, with more abundant suitable food species (e.g. *E.tereticornis*) and higher water/nutrient content (i.e. associated with alluvial landscapes).

While the habitat within the extension land is mapped as suitable for Koala, due to the occurrence of known food trees, it is considered a "low usage" area. Koalas are known to prefer eucalypts on lower slopes/plains that support higher nutrient soils. The extension land has limited habitat meeting this criteria. While the extension land is not discounted as Koala habitat, it is not considered "critical" but rather "low-value" or "low quality". The area associated with the waterway (in the west) supports large *E.tereticornis* on alluvial soils and is considered more suitable for Koala.

Having considered the above and other relevant information Gondwana identified 192ha of potential habitat for Koala within the extension land and it is considered the proposed action will result in clearing of a total of 112.75ha of Koala habitat (refer Drawing No. 1001.280r4 – MNES for Proposed Impact and Offset Areas).

2.3.2 Grey-headed Flying-fox

This species occurs in the coastal belt from Rockhampton in central Queensland to Melbourne in Victoria and requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, *Melaleuca* swamps and *Banksia* woodlands. It also feeds on commercial fruit crops and on introduced tree species in urban areas. The primary food source is blossom from *Eucalyptus* and related genera but in some areas it also utilises a wide range of rainforest fruits.

The extension land is characterised by a mixed open sclerophyll forest dominated by *Corymbia citriodora* (Spotted Gum) along ridges and upper slopes. *Lophostemon confertus* (Brushbox) and the occasional *Eucalyptus propinqua* (Grey Gum) are more dominant on the lower slopes. Brushbox is the dominant canopy species along the drainage lines. The majority of drainage lines are heavily disturbed with modified understorey and groundcover often dominated by weed species with some rainforest understorey species occurring in the confines of the gully. This habitat is similar to that which occurs in the local landscape. It is possible this species would occasionally forage in the area. Closed forest occurs to the west and within a waterway outside the extraction footprint. It is likely these areas are of a higher quality habitat for this species than the extension land which supports low to moderate value habitat.

The Commonwealth PMST reports the *type of presence* of this species within 5km of the development site as “foraging, feeding or related behaviour known to occur within area”. The Queensland State Wildlife database reports no records for this species within 10km from the development site. There are no known Grey-headed Flying-fox roost within 5km of the development site. The nearest roost (not necessarily Grey-headed Flying-fox) is Mt Warren Park (Yvonne Crescent, Beenleigh) to the north of the development site. Having considered the above and other relevant information in the previously prepared TEA Gondwana identified the extension land contains approximately 192ha of potential habitat. However, this species has not been recorded on the extension land or immediate surrounds during comprehensive surveys (specifically targeting threatened species) over a number of years (2008, 2013, 2014 and 2015).

2.3.3 Mary River Cod

The development site is characterised by a mixed open sclerophyll forest with no waterbodies or streams. This species prefers deep shaded pools with slow flowing water. The Commonwealth PMST reports the *type of presence* of this species within 5km of the development site as “translocated population known to occur within area”. The Australian Government species profile identifies that the Mary River Cod has been stocked in impoundments for recreational angling since 1983. This includes Hinze Dam on the Nerang River and Maroon Dam on the Albert-Logan River. The Queensland State Wildlife database reports no records within 10km from the development site. It is possible this species occurs as “a translocated population” in the Albert River (tributary) to the west of the development site. However, there is no habitat suitable for this species within the extension land or surrounds.

2.3.4 Macadamia Nut

This species grows in remnant rainforest, preferring partially open areas such as rainforest edges. Vegetation communities in which the Macadamia Nut is found range from complex notophyll mixed forest, extremely tall closed forest, simple notophyll mixed very tall closed forest to simple microphyll-notophyll mixed mid-high closed forest with *Araucaria* and *Argyrodendron* emergent.

The Commonwealth PMST reports the *type of presence* of this species within 5km of the extension land as “species or species habitat likely to occur within area”. The Queensland State Wildlife database reports eight records for this species within 5km from the extension land and no records within 1km. The Queensland Regulated Vegetation mapping identifies remnant vegetation and non-remnant areas within the extension land. The majority of vegetation within the area is mapped as open eucalypt forests comprising of RE 12.11.5 and 12.11.3.

RE 12.11.5 is mapped across the majority of the area and comprises an open forest complex in which *Corymbia citriodora* is relatively common along with *Eucalyptus siderophloia* and occurs on hills and ranges of metamorphics and interbedded volcanics. *Lophostemon confertus* is often present in gullies and as a sub-canopy tree. RE 12.11.3 is mapped along gully

lines and comprises an open forest generally with *Eucalyptus siderophloia*, *E. propinqua* +/- *E. microcorys*, *Lophostemon confertus*, *Corymbia intermedia* on metamorphics and interbedded volcanics. The vegetation community for the Macadamia Nut essential habitat is described as, "Dry vine thicket; complex notophyll vine forest; *Araucarian* notophyll vine forest" and includes regional ecosystems 12.11.3 and 12.11.5.

While areas of RE 12.11.5 and RE 12.11.3 are proposed for clearing, none of this habitat is considered suitable for this species. Habitat for this species within the development site is considered negligible. Quality would be considered low to extremely low. Habitat of approximately 9.2ha, potentially considered "high quality" occurs outside of the extraction footprint to the west and south of the extension land in the form of closed forest. There are known records of this species to the south and west of the extension land in areas proposed for rehabilitation and conservation protection by inclusion within the offset area. The extent of the offset and associated biodiversity values is discussed in further detail in Section 5 of this document. However, targeted searches (2005, 2008, 2013, 2014 and 2015) failed to record this species within the proposed extraction footprint and this species is fairly distinctive and is unlikely to have been overlooked.

2.3.5 Ormeau Bottle Tree

The Ormeau Bottle Tree is a distinctive canopy tree that grows in riparian rainforest. It occurs near small streams in rocky gorges comprised of meta-sedimentary rocks among microphyll vine forest; and on quaternary alluvium near larger streams in notophyll vine forest communities. It appears to favour undisturbed rainforest, with few weeds, for reproduction.

The Commonwealth PMST reports the *type of presence* of this species within 5km of the extension land as "species or species habitat likely to occur within area". The Queensland State Wildlife database reports eleven records for this species within 5km from the extension land and two records within 1km of the site. The Queensland Regulated Vegetation mapping (accessed March 2014) identifies remnant vegetation and non-remnant areas within the development site. The majority of vegetation within the area is mapped as open eucalypt forests comprising of RE 12.11.5 and 12.11.3. Both of these REs are identified as 'least concern' regulated vegetation.

RE 12.11.5 is mapped across the majority of the area and comprises an open forest complex in which *Corymbia citriodora* is relatively common along with *Eucalyptus siderophloia* and occurs on hills and ranges of metamorphics and interbedded volcanics. *Lophostemon confertus* is often present in gullies and as a sub canopy tree. RE 12.11.3 is mapped along gully lines and comprises an open forest generally with *Eucalyptus siderophloia*, *E. propinqua* +/- *E. microcorys*, *Lophostemon confertus*, *Corymbia intermedia* on metamorphics and interbedded volcanics. The vegetation community for the Ormeau Bottle Tree essential habitat is described as, "Notophyll vineforest; open forest of *Eucalyptus* spp. with shrubby understorey" and includes the following regional ecosystems, 12.11.3 and 12.11.5.

Whilst RE 12.11.5 and RE 12.11.3 (i.e. State mapped regional ecosystem) is proposed for clearing, habitat for this species within the extension land is considered marginal or low to moderate quality. Habitat of approximately 1.15ha, potentially considered "high quality" occurs outside of the extraction footprint but within the extension land in the form of closed forest and there are known records of this species in that area which is now proposed for rehabilitation and conservation protection through the proposed offset. However, this species was not recorded in targeted searches within the proposed extraction footprint. This is a species with noticeable characteristics and unlikely to have been overlooked during target surveys in 2005, 2008, 2013, 2014 and 2015.

2.3.6 Shaggy-haired Cockspur Flower

This species occurs on rock outcrops of sandstone or chert in shaded situations in eucalypt woodland often close to vine forest. Potential habitat occurs within some of the gullies within the extension land. Potential habitat on rock pavements in meta-sedimentary gorges is heavily infested with lantana, creeping lantana and molasses grass. Habitat quality for this species would be considered primarily low throughout the extension land, although some gullies may provide moderate value habitat. The Commonwealth PMST reports the *type of presence* of this species within 5km of the extension land as "species or species habitat likely to occur within area". The Queensland State Wildlife database reports one record for this species within 5km from the extension land and no records within 1km of the site. There is no State-mapped essential habitat for this species within the local surrounds. Areas of possible habitat of approximately 22ha occur within the extension land including within the extraction footprint. However, targeted searches (2005, 2008, 2013, 2014 and 2015) failed to record the species within the extension land.

2.3.7 Spiny Gardenia

This species grows in subtropical, riverine, littoral and dry stunted rainforests along moist scrubby water courses at altitudes up to 360m, with most records made from below 100m. The Commonwealth PMST reports the *type of presence* of this species within 5km of the development site as “species or species habitat likely to occur within area”. The Queensland State Wildlife database reports three records for this species within 5km from the development site and one record within 1km of the site. The Queensland Regulated Vegetation mapping identifies remnant vegetation and non-remnant areas within the extension land. The majority of vegetation within the area is mapped as open eucalypt forests comprising of RE 12.11.5 and 12.11.3.

RE 12.11.5 is mapped across the majority of the area and comprises an open forest complex in which *Corymbia citriodora* is relatively common along with *Eucalyptus siderophloia* and occurs on hills and ranges of metamorphics and interbedded volcanics. *Lophostemon confertus* is often present in gullies and as a sub-canopy tree. RE 12.11.3 is mapped along gully lines and comprises an open forest generally with *Eucalyptus siderophloia*, *E. propinqua* +/- *E. microcorys*, *Lophostemon confertus*, *Corymbia intermedia* on metamorphics and interbedded volcanics. The vegetation community for the Spiny Gardenia essential habitat is described as, “*Araucarian microphyll* vine forest; *Notophyll* vine forest; rainforest margins with *Argyrodendron trifoliolatum*, *Dissiliaria*, *Grevillea hilliana*, *Eucalyptus acmenoides*, *E. propinqua*” and includes the following regional ecosystems 12.11.3 and 12.11.5.

Whilst RE 12.11.5 and RE 12.11.3 (i.e. State mapped regional ecosystem) is proposed for clearing, none of this habitat is considered suitable for this species. Habitat for this species within the extension land is considered marginal. Quality would be considered low to extremely low. Habitat of approximately 6.52ha, potentially considered “high quality” occurs outside of the extraction footprint to the west and south of the extension land in the form of closed forest. There are known records of this species to the south of the development site in an area proposed for rehabilitation and conservation protection. However, targeted searches (2005, 2008, 2013, 2014 and 2015) failed to record the species within the extension land.

2.3.8 Native Jute

This species occurs in ecotones between wet eucalypt forest and dry to dry-subtropical rainforest on sheltered slopes and gullies, and grassy, open forest on exposed slopes and ridges. This species has potential to occur within sheltered gully slopes and vine thicket margins predominantly outside the extension land. Typical (preferred) habitat for this species occurs outside the extension land, within areas proposed for rehabilitation and conservation protection. Based on the habitat requirements for this species, results from databases and active searches, habitat quality within the extension land would be considered low.

The Commonwealth PMST reports the *type of presence* of this species within 5km of the extension land as “species or species habitat likely to occur within area”. The Queensland State Wildlife database reports one record for this species within 5km from the extension land and no records within 1km of the site. There is no State-mapped essential habitat for this species within the local surrounds. Areas of possible habitat of approximately 22ha occur within the extension land including within the extraction footprint. However, targeted searches (2005, 2008, 2013, 2014 and 2015) failed to record the species within the extension land.

3. Relevant Impacts

The following section addresses the impacts of the proposed action on the matters of national environmental significance as set out in the DotE request for additional information which included the following:

“The Preliminary Documentation must address how the elements of the action (during construction and ongoing phases of the action) may impact matters of national environmental significance that are identified as being present, or potentially present within and adjacent to the project area. Information must include discussion of how undertaking the proposed action would not be inconsistent with relevant recovery plans, threat abatement plans and recovery advices under the EPBC Act.”

It should be noted that the proposed action being extractive industry does not have distinctive construction phase particularly as it is an existing quarry.

3.1 Koala

3.1.1 Area and quality of koala habitat to be removed

The DotE request for additional information has asked for the following information:

“An assessment of the area (in hectares) and quality of Koala habitat to be removed as part of the proposed action. This should include but is not limited to:

- i. an assessment of vegetation in the proposal area against the criteria for habitat critical to the survival of the Koala contained in the Department’s EPBC Act referral guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory), December 2014; and*
- ii. the value of the habitat for maintaining connectivity between other areas of Koala habitat adjacent to the proposal area.”*

As discussed above, it is considered the proposed action will result in clearing of a total of 112.75ha of Koala habitat (refer Drawing No. 1001.280r4 – MNES for Proposed Impact and Offset Areas). As discussed previously, while the habitat within the extension land is mapped as suitable for Koala, it is considered a “low usage” area. Koalas are known to prefer eucalypts on lower slopes/plains that support higher nutrient soils. The extension land has limited habitat meeting this criteria. While the extension land is not discounted as Koala habitat, it is “low-value” or “low quality”. The following assessment has been conducted utilising the Koala habitat assessment tool within the referral guidelines. Section 7 of the referral guidelines provides the Koala habitat assessment tool which has been relied upon for the following assessment in Table 1 – Koala Habitat Assessment below. The extension land is mapped within a coastal area as per the distribution map.

Table 1 – Koala Habitat Assessment

Attribute	Score	Comment
Koala occurrence	+2	Evidence of Koala has been found within the extension land within the last two years.
Vegetation composition	+2	The extension land contains forest or woodland with 2 or more known Koala food tree species in the canopy.
Habitat connectivity	+1	The extension land is part of a contiguous landscape of greater than 300ha but less than 500ha. We are of this view on the following basis: <ul style="list-style-type: none"> • Stanmore Road in the north is a major State Controlled Road and is without effective koala passage measures and acts as a barrier. • At the north and east of the extension land are adjoining industry and extractive industry development with significant land disturbance and heavy vehicle traffic also acting as a barrier. • Harts Road to the west of the extension land is the current access to the existing quarry with significant heavy vehicle traffic and is without effective koala passage measures acting as a barrier. • The land between the extension land and the adjoining extractive industry to the east is very steep also acting as a barrier. • The existing quarry to the south of the extension land being significantly disturbed land with heavy vehicle traffic also acts as a barrier.
Key existing threats	0	The site is surrounded by operational quarries and an arterial road. Heavy vehicle traffic associated within the existing quarry operations are existing threats in addition to the traffic on Stanmore Road to

		the north. Koala records have been obtained which show no records of Koala mortality in the immediate area. These records considered with the findings of the ecological study suggest that Koala do not rely on the extension land due to the existing threats in the landscape.
Recovery value	+1	The extension land is considered Koala habitat of "low usage" and "low-value". There is only limited evidence of Koala usage of the extension land. As a result it is unknown if the Koala utilising the area are genetically diverse, free of disease or are breeding and whether the extension land provides any connectivity value. Therefore, it is uncertain if the area is important for achieving the interim recovery objectives.

Gondwana advised that the area proposed to be cleared is not connected to any large parcel of vegetation land or any areas identified for conservation (or similar future purposes). Given the current land uses surrounding the area to be cleared and those envisaged by Council's planning scheme there is no significant connectivity existing currently or envisaged for the future. Accordingly, the proposed clearing will not result in fragmentation of habitat intended to provide connectivity currently or in the future. We note the proposed clearing is located in the northern area of the site where connectivity is limited as discussed, and the proposed offset areas are located in the southern area of the site where existing linkages and connectivity will be strengthened.

3.1.2 Indirect impacts on koala

The DotE request for additional information has asked for the following information:

- "An assessment of indirect impacts on the Koala from the proposed action. This should include but is not limited to:*
- i. the critical size of habitat patches for the long term persistence of Koalas in and adjacent to the proposal area, with a discussion of the adequacy of the habitat proposed to be retained in the proposal area for this purpose;*
 - ii. the ability of the retained habitat in the proposal area to maintain connectivity between other areas of Koala habitat, including mechanisms to ensure long term security of conserved habitat; and*
 - iii. details of the potential cumulative direct and indirect impacts to the Koala within the broader area."*

It is suggested that for a long term population of Koalas to remain viable, it should consist of at least 500 individuals (*McAlpine et al. 2006*) and it is estimated that at least 4000 ha of Koala habitat is required to sustain such a population; depending on habitat quality and other threatening processes such as predation and road density (*McAlpine et al. 2006*). The proposed action is not located within such a habitat patch. However, if habitat is composed of primary and/or secondary Koala habitat the critical patch size for the probability of Koala occurring was estimated as 50 to 100ha by a study in the Noosa region (*McAlpine et al. 2006, Callaghan et al. 2011*). It is also understood that connected areas of even marginal habitat are likely to be important for Koala movement. The proposed action incorporates proposed offset areas which total in excess of 100ha connected to other existing habitat areas to achieve habitat patches of at least 50ha, indicating that the probability of Koala occurring within the landscape will be maintained.

Land to the immediate south of the extension land is currently operated as the existing Hanson Wolfdene Quarry which will continue to be operated. Land to the east of the proposed extension area is the adjoining extractive industries which will continue to be operated. Land to the west of the proposed extension area is identified by the Yatala Enterprise Local Area Plan for industrial development. Land to the north is zoned for extractive and industrial purposes (and is cleared for the most part) as is much of the land in the surrounds. The Council Local Area Plan Map 29.2 Precincts (2009) (refer Attachment 4 – Gold Coast City Council Yatala Enterprise Area Local Area Plan – LAP Map 29.2 Precincts) identifies the extension land as located within the Extractive Industry Precinct of the Yatala Enterprise Area Local Area Plan. Development of the extension land for Extractive Industry is consistent with the intent of the Local Area Plan (LAP). Land surrounding the extension land is mapped as either Extractive Industry or Future Industry. The LAP does not contemplate habitat connectivity through the Extractive Industry precinct. The long term planning by State and Local government did not deem protection and retention of habitat within the Extractive Industry precinct as necessary. Furthermore, as discussed in Section 3.2.4 of this report, repeated and extensive survey work have failed to identify evidence of populations of koala on the proposed extension land or proposed offset area other than a single scat in 2013 and two scats in 2014. Accordingly, it is not expected that an individual development such as the extension of the Wolfdene Quarry would contribute to a significant impact to the wider Koala population on the Gold Coast or the overall decline in the Koala population at a State level as there is little evidence that the site is relied upon by a population of Koalas.

The proposed offset areas in the north (i.e. within Lot 1 and 3 on SP244693, Lot 87 WD1009 and Lot 2 RP813599), south east and south west on Hanson's land holdings, in conjunction with the proposed buffer lands will establish habitat connectivity around the proposed action above and beyond that which is envisaged by the State and Local planning

instruments. The proposed offset areas are within land owned by Hanson and would be protected under covenant in perpetuity and managed in accordance with an approved management plan which would be prepared in consultation with the relevant authorities. It should be noted that the proposed extraction footprint would provide sufficient reserves for continued operation of the quarry for approximately 80 to 100 years subject to market demand. Accordingly, the operator and land owner will have an ongoing connection within the proposed offset area which would be managed over the same time period enhancing its value in the landscape over the long term.

As previously discussed, numerous targeted studies have identified limited evidence of Koala usage of the extension land. Having considered this and noting that the proposed offset area in the north (in excess of 60ha) and the proposed offset areas in the south and south east (connected to larger areas of habitat in excess of 100ha) will be subject to ongoing management to improve the quality of the habitat, it is considered that the retained habitat within the proposed offset areas and buffer lands will provide adequate koala habitat in the long term.

3.2 Other listed species and communities

3.2.1 Threatened species and communities

The DotE request for additional information has asked for the following information:

"The presence, status and extent of EPBC Act listed threatened species and communities (including those matters identified in Section 1) that could be affected by the proposal. This response must detail the quantum and quality of habitat in hectares (and as number of individuals, if available and applicable), and the area of potential habitat for the species and communities likely to be impacted"

The presence, status and extent of EPBC Act listed species is addressed in Section 2 of this report which has been informed by the previously submitted TEA prepared by Gondwana. It is considered that the only EPBC Act listed species (or MNES) that have any significant reliance on the site are the koala and populations of *Macadamia*. The populations of *Macadamia* do not occur within the extraction footprint and therefore will not be impacted. Known habitat for populations of *Macadamia* is located within the extension land and included within the proposed offset and buffer areas. Accordingly, it is considered that the koala is the only threatened species that has the potential to be impacted by the proposed action.

3.2.2 Indirect impacts on threatened species and communities

The DotE request for additional information has asked for, *"Details on the distance of proposed works to any habitat for (or individuals of) EPBC Act threatened species and communities within 500 metres of the disturbance footprint, and information on the long term viability of these populations if the proposal was to proceed. The information should consider and describe in detail all possible indirect impacts associated with the action, and should quantify the areas of habitat in hectares (and as number of individuals, if available) which may be indirectly impacted as a result of the proposal (i.e. through fragmentation of habitat, isolation of populations, air and water-borne pollution, weed invasion, increased predation, vehicle strike, removal of habitat corridors etc.)"*

Components of the proposed action if not appropriately managed could result in possible indirect impacts to surrounding land such as, altered hydrology, sedimentation, dust deposition, noise and vibration, weed spread, fragmentation of habitat and vehicle strike. Refer to Section 2.3 for comment in relation to species and communities within proximity of the proposed action, noting that the habitat on site is representative of the surrounding landscape. Management measures are required to be implemented as part of the ongoing operation of the quarry to minimise the likelihood of the identified impacts. Furthermore, as suitable offset and buffers have been provided to protect the species and communities within Hanson's land holdings it is considered that adjoining values will also be protected. Management measures to protect species and communities in the offset and buffer areas from these potential impacts are outlined in the Site Based Management Plan (SBMP). It should be noted that the SBMP will be updated prior to the commencement of the activity to be consistent with the conditions of approval from the Local and State government authorities and if applicable DotE.

Measures that may be implemented include, but are not limited to, the following:

Fragmentation of habitat:

- Progressive rehabilitation to ensure the land is progressively stabilised, revegetated and suitable for the post extraction land uses. An example of the effective progressive rehabilitation of quarry benches being conducted at the existing quarry is shown in the image below (Plate 1 – Progressive Rehabilitation).
- Install markers, flagging or fencing around protected vegetation and vegetation to be retained or areas under rehabilitation.

Plate 1 – Progressive Rehabilitation



Vehicle strike:

- Limit speed on the site
- Access will be restricted to areas awaiting rehabilitation, or undergoing rehabilitation
- Employees and contractors shall be made aware of the restricted areas through site inductions
- Fencing, flagging, or other suitable barricades or markers may be installed around areas under rehabilitation to prevent damage.

Stormwater contamination management:

- Measures to be taken to minimise the potential for contamination of stormwater overland flow from the site are as follows:
 - directing runoff from disturbed areas to the quarry pit, sediment basin or excavated sediment trap for treatment before being released
 - recycle waters collected in the sediment dam, excavated sediment trap or quarry pit(s) to the maximum extent practical (e.g. dust suppression and watering rehabilitated areas)
 - undertake any necessary on-site maintenance in an area where contaminants cannot be released to surrounding receiving waterways or on-site sediment basin(s) or excavated settling traps
 - store all hazardous materials, chemicals and food product wastes generated on-site under cover or with appropriate safeguards
 - undertake rehabilitation of disturbed areas and final batters progressively to the extent practicable; and
 - dispose of wastes off-site on a regular basis.

Erosion control:

- Reasonable and practicable erosion control measures will be implemented on-site to limit soil erosion including stabilising and vegetating road embankments and batters, temporary overburden and topsoil stockpiles and diversion banks or perimeter bunds.

Dust:

- Specific control measures to be implemented for particular operational phases or activities include, but are not necessarily limited to:
 - dampening down of cleared areas, extraction working areas, haul roads, stockpiles and other hardstand areas by water spraying when visual surveillance indicates excessive dust generation and propagation from point or mobile sources
 - installation and maintenance of water sprays or dust extraction systems on crushing and screening plant
 - limiting topsoil/overburden removals at any one time to that necessary while providing for effective production
 - limiting removal of topsoil/overburden to periods of favourable weather conditions
 - restricting vehicle and mobile machinery movements to designated routes and hardstand areas
 - temporarily revegetating topsoil stockpiles where practicable
 - as soon as practicable, revegetate completed areas to stabilise the landscape
 - enforce a <40 kph maximum speed limit on unsealed haul and internal roads
 - covering all loads of material leaving the site
 - clearing of spillage from side rails, tailgates and draw bars of trucks (following loading and tipping)
 - cleaning of trafficable areas as necessary
 - where possible, sealing with bitumen or other equivalent hard surface material, or otherwise maintaining trafficable areas to the satisfaction of the administering authority
 - ensuring employees and contractors are aware of dust minimisation practices
 - daily visual surveillance of control measures to ensure system performance accords with design and implementation criteria.

Noise:

- The following noise control measures may be implemented to assist in mitigating noise associated with the site activities (if necessary):
 - position the processing plant and ancillary equipment away from adjacent residences as far as practicable
 - positioning of stockpiles between noise generating sources and sensitive receptors to act as a barrier to provide noise attenuation
 - enclosing fixed engines, pumps and compressors, where practicable
 - operating and maintaining modern, well maintained, roadworthy product delivery trucks fitted with high efficiency mufflers
 - shutting down equipment when not in use
 - fitting broadband reversing alarms, rather than audible sirens or beepers, on mobile equipment where practicable
 - avoiding unnecessary operation of plant or revving of mobile or stationary motors and engines.

Blasting:

- Handling, transport and use of explosives shall be carried out in accordance with the requirements of the Mining and Quarrying Safety and Health Act 1991.
- The site will adopt modern blasting technology
- Only suitably experienced and qualified blasting personnel shall be employed or contracted to provide blasting services
- Preference shall be given to larger yielding but smaller number of blasts rather than a large number of smaller yielding blasts
- Keep the maximum instantaneous charge or charge mass per delay, to the lowest possible level
- A blast plan shall be prepared for each shot, containing hole layout, initiation sequence, charging, stemming type and height, charge weight and any other design element required for good blasting practice
- Blast areas may be wetted down to minimise dispersion of dry and fine materials where practicable or where it is identified as a source of potential complaint or non-conformance.

Weeds:

- General
 - identify weeds on-site and in surrounding areas, prioritise weeds and weed management options, and determine the cause
 - control infestations as soon as possible to prevent further spread of weeds
 - a combination of weed management options to reduce weeds on-site shall be adopted. Depending on the weed types these may include mechanical, chemical, biological, slashing, burning and hand removal practices
 - monitor and evaluate the progress of weed management efforts on-site
 - employees to be able to recognise existing and potential weeds present on-site and within the surrounding area to ensure they are not inadvertently brought in via items contaminated by seed (e.g. vehicles, machinery, hand tools, soil, mulch or livestock)
 - use established roads and tracks and avoid weed-infested areas/sites
 - if areas containing weeds are encountered, clean all equipment, vehicles and machinery prior to leaving
 - dispose of weed plant material and seed by disposal at the council refuse stations, burning and/or burying at an appropriate depth on-site
 - maintain existing groundcover for as long as possible by restricting/minimising land disturbance at any one time, where practicable
 - restrict vehicular and stock access on-site
 - ensure equipment entering and leaving the site is free of soil and vegetation, both externally (include tracks/tyres, underbody, engine bay, radiator, buckets, body, chassis, trays, blades) and internally (include cabin, tool boxes, storage compartments)
- Access roads/ hardstand areas
 - all access routes and hardstand areas will be maintained in a weed-free or weed-reduced state to lessen the spread of weed seed by vehicle movements
- Topsoil management
 - visual surveys will be undertaken prior to all topsoils stripping operations and, if necessary, control mechanisms will be undertaken to reduce the risk of the contamination of topsoil stockpiles with seed and vegetative weed material
 - weed control mechanisms may include separate stockpiling, herbicide spraying of stripped soils, or disposal as fill of soil materials infested with weeds
 - weed control mechanism strategies will be implemented to control weed infestation if required, both before and after use of top-dressing material in the rehabilitation program
 - all topsoil stockpiles will be regularly monitored and managed for weed infestation.
- Rehabilitation
 - rehabilitate disturbed areas as soon as practical following extraction
 - bringing topsoil onto the site should be avoided
 - prior to the establishment of vegetation:
 - § a spraying campaign may be required to prevent migration or establishment of weed species into the area under rehabilitation; or
 - § using alternative methods for controlling both grasses and weeds including manual weeding, burning, slashing, weed matting and mulching, where practicable.

3.2.3 Unknown, unpredictable or irreversible impacts

The DotE request for additional information has asked for, “*details on whether any impacts are likely to be unknown, unpredictable or irreversible*”. It is considered that potential impacts associated with extractive industry are well known, predictable and over time can be minimised through existing well-established management measures already implemented at the quarry and mitigated through progressive rehabilitation of disturbed areas.

3.2.4 Surveys

The DotE request for additional information has asked for, “*an assessment of the adequacy of any surveys undertaken (including survey effort and timing) with regards to the species listed in Section 1*”.

As discussed by Gondwana in the previously submitted TEA, Gondwana completed three site inspections, including a five day (four night) comprehensive and targeted fauna and flora survey the week of 24th February 2014. Additional site

inspections were completed on 13th February, 6th March and 30 July 2014. Furthermore, various fauna and flora assessments have been completed within the subject area and adjacent allotments in the past. Field surveys for these assessments are reported to have been completed in November 2004, January 2008 and January 2013 (Gold Coast Botany and BAAM). Accordingly, it is considered that the survey effort undertaken for the proposed action is adequate.

3.2.5 Additional studies or surveys

The DotE request for additional information has asked for, *"Details of any additional studies, or surveys which were not included in the referral"*. No additional comprehensive studies or surveys were conducted which were not included in the referral documentation. However, a further site inspection was conducted in February 2015 by Gondwana. No records of threatened MNES were recorded during that site inspection.

3.2.6 Local and regional scale analysis of likely impacts

The DotE request for additional information has asked for, *"a local and regional scale analysis of the likely impacts to the protected matters addressed in Section 1"*. Refer to Section 2.3 for comment in relation to other listed species at a local and regional scale.

4. Proposed Avoidance, Management and Mitigation Measures

4.1 Implementation procedures

The DotE request for additional information has asked for the following information:

“details of the procedures to be implemented prior to and during vegetation clearing and quarry development to protect against threatened species mortality”

Planning for the proposal has involved the consideration of environmental, physical and operational constraints to evolve the development proposal and associated progressive rehabilitation. A Site Based Management Plan for the proposed development has been prepared to provide a practical guide at the operational level to contain potential environmental impacts and establish monitoring programs. It should be noted that the Site Based Management Plan will be updated prior to commencement of the use and activity to reflect the obligations and requirements of the relevant approvals. The following measures are taken from the Site Based Management Plan which was included in the referral documentation.

Fauna and Flora

- Any necessary vegetation and fauna protection measures will be in place prior to the commencement of any stage of Site excavations and be maintained until the area is fully rehabilitated, and will include:
 - Surveying area to be cleared to be undertaken by an appropriately qualified person prior to clearing. The pre-clearing survey would follow the standard protocols and clearing of that area would not proceed until the listed threatened species, including EPBC listed species, vacates the area by its own volition.
 - Engaging a spotter-catcher holding a valid Rehabilitation Permit from the EHP prior to any clearing operations to supervise, minimise risk of injury to fauna and undertake the removal and relocation of fauna where necessary, when recommended by the pre-clearing fauna survey and approved by EHP.
 - Transplanting any identified species, including EPBC listed species, for protection as necessary or practicable in accordance with the relevant policies and guidelines
 - Installing markers, flagging or fencing around protected vegetation/vegetation to be retained zones or areas under rehabilitation.
 - Implementing stormwater, erosion and sediment controls before any excavation works commence for each stage of extraction and are maintained until the area is fully rehabilitated.

Vegetation Clearing

- Prior to the clearing of any vegetation, a Vegetation Clearing Plan will be prepared in accordance with the following protocols:
 - Land disturbance is to be minimised and clearing limited, as far as practical, to the extent necessary for each stage.
 - The sequence and direction of vegetation clearing will be designed to ensure fauna have sufficient opportunity to move from the clearing Site without human intervention.
 - Vegetation clearing shall be carried out in stages using a sequential clearing technique.
 - Prior to clearing, the limits of the approved area to be cleared shall be clearly marked with markers, flagging or fencing prior to clearing.
 - A pre-clearing survey of area(s) to be cleared shall be undertaken by an appropriately qualified person and where fauna is identified on-site appropriate action is to be undertaken to minimise potential harm to fauna.
 - Trees containing fauna or suspected of containing fauna shall be marked with coloured survey tape which is wrapped several times around the tree trunk at chest height.
 - No tree containing fauna or suspected of containing fauna or any overlapping canopy tree will be cleared until the animal has vacated the tree or has been relocated (if appropriate).

In relation to potential translocation of listed threatened fauna species, we are of the view that this is unlikely to occur. For example, if a population of Koala or Grey-headed Flying-fox or other listed threatened species was encountered it is

anticipated that the pre-clearing survey would follow the standard protocols and clearing of that area would not proceed until the listed threatened species vacates the area by its own volition. Similarly, it is also considered unlikely that translocation of listed threatened flora species would be required as the significant survey efforts conducted to date have not identified populations within the proposed extraction footprint. However, if a population was encountered it is anticipated that the Department would as a minimum expect that translocation be considered as an option. Any transplanting of identified species, included EPBC listed species, will be undertaken in accordance with the relevant policies and guidelines.

4.2 Koala

4.2.1 Avoidance and mitigation measures and likely residual impacts

The DotE request for additional information has asked for the following information:

“detailed assessment of the avoidance and mitigation measures proposed to be undertaken to limit the impact on the Koala. This assessment should include, but is not limited to:

- *measures to avoid and/or mitigate the identified direct and indirect impacts to threatened species and their habitat from the proposed action;*
- *a discussion of the likely residual impacts to threatened species after proposed avoidance and/or mitigation measures are taken into account.”*

As previously discussed numerous targeted studies located only limited evidence of koala within the extension land which is considered to contain low usage and low value habitat for koala. Components of the proposed action if not appropriately managed could result in impacts to koala habitat from, altered hydrology, sedimentation, dust deposition, noise and vibration, weed spread, vehicle strike and fragmentation of habitat. Avoidance and mitigation measures to address these potential impacts are incorporated within the Site Based Management Plan and the proposed action will continue the implementation of existing:

- stormwater management measures including a series of diversion drains and bunds to divert clean water around disturbed areas, and capture stormwater from disturbed areas for treatment in sediment basins prior to controlled release to comply with the relevant release criteria as per the site's EA.
- air quality management measures including dampening down of disturbed areas, full enclosure of fixed processing plants, limiting removal of topsoil and overburden during unfavourable weather conditions to meet dust deposition limits as per the site's EA.
- noise and vibration management measures including positioning of plant and ancillary equipment away from adjacent residences, enclosing plant and equipment, adopting modern blasting technology and relying upon suitably experienced and qualified blasting personnel to ensure compliance with noise and vibration limits as per the sites EA.
- weed management measures appropriate to the type of weeds identified on site including but not limited to mechanical, chemical, biological, slashing, burning and hand removal practices.
- vegetation clearing management measures including pre-checks by fauna spotters and staged clearing which will be further refined and developed in response to anticipated conditions of approval from Council requiring staged Operational Works (Tree Clearing) approvals to be obtained.

With regards to vehicle strike, it should be noted that the proposed action does not seek an increase in annual production and therefore the existing traffic impact associated with the existing quarry operation will not increase as a result of the proposed action. Following the implementation of the management measures outlined in the Site Based Management Plan it is considered that the proposed action is unlikely to impact on the ecological values of surrounding koala habitat.

In addition to the above measures the design of the quarry footprint has been refined multiple times since lodgement of the development application to the Council in an effort to avoid and minimise potential impacts and has been further modified in the preparation of this report resulting in a further reduction of the extraction footprint and a further increase in the extent of habitat to be retained for offsets.

Taking into consideration the reduction of the extraction footprint and management measures within the Site Based Management Plan the proposed action as shown on Drawing No. 1001.285 and 1001.280r4 will result in the loss of 112.75ha of habitat from the site which meets the criteria for consideration as habitat critical to the survival of the koala.

4.3 Other Listed Threatened Species and Communities

The DotE request for additional information has asked for the following information:

"specific measures to avoid, mitigate and manage impacts to other listed threatened species and communities that may be affected by the proposal. For example, this must include a description of any mitigation measures for fire, erosion, sediment and stormwater control, managing the potential for contamination of local water ways through site run-off or management of soil disturbance, introduction or spread of disease and the potential for new weeds to establish or existing weeds to spread. This must include an assessment of the expected or predicted effectiveness of the mitigation measures and any statutory or policy basis for the mitigation measures;"

Gondwana assessed the potential impact on species listed as threatened (endangered, vulnerable or as a MNES) under the EPBC Act in the previously submitted TEA. That assessment concludes that the only EPBC Act listed species (or MNES) that have any significant reliance on the site are the koala and populations of *Macadamia*. The populations of *Macadamia* do not occur within the extension land and therefore will not be impacted.

In relation to measures to avoid, mitigate and management potential impacts to populations of *Macadamia Nut* from hydrological changes associated with the action, section 2.3.4 of this document confirms that targeted searches failed to record this species within the proposed extraction footprint. As shown on Attachment 2 of this document the largest population of this species is located on the western boundary of the site, outside the extraction footprint and within the proposed offset and buffer areas. This population is located on an elevated ridgeline in a different catchment to the existing and proposed extraction area. Accordingly, potential hydrological impacts are not anticipated from the proposed action to this population as the action has avoided the catchment for this population.

A second smaller population of the species is located in the south western corner of Lot 80 CP893560 adjacent to the existing and proposed extraction footprint. The buffer to the wild *Macadamia Nut* population within the creek traversing the western portion of Lot 80 on CP893560 was requested by the Gold Coast City Council information request letter dated 26 November 2013 and included in the conditions of approval issued by the Queensland Government, Department of State Development Infrastructure and Planning and Department of Environment and Heritage Protection. Accordingly, we consider that the proposed buffer to the second smaller population of the species is appropriate. The location of the population is down stream of the existing extraction area which holds prior authorisation under Section 43A of the EPBC Act. However, the population is upstream of the extension land and therefore changes to hydrology in the extension land are unlikely to impact this population. Accordingly, potential hydrological impacts are not anticipated from the proposed action to this population as the action has avoided the catchment for this population.

A third population of the species is located on the boundary of Lot 80 CP893560 and Lot 2 RP15903. It is understood that this population consist of two individual plants. The plants are located on the waterway within habitat proposed to be retained. Similar to the second population discussed above, these two plants are located downstream of the existing quarry which holds prior authorisation under Section 43A of the EPBC Act. However, these two plants are downstream of a small catchment area of less than 10ha within the extension land. That catchment once under extraction will report back to the waterway after treatment in the sedimentation dams for the existing quarry. It is anticipated that the inclusion of the waterway as habitat to be protected and as part of the land to be managed under the offset management plan will result in an overall net improvement to the quality of this habitat, particularly due to the cessation of cattle grazing.

In relation to erosion, sediment and stormwater control, if approval is granted for the extension of the Wolfdene Quarry it will be operated pursuant to an Environmental Authority (EA) issued by the Department of Environment and Heritage Protection under the *Environmental Protection Act 1994* (EP Act). The EA authorises the carrying out of an Environmentally Relevant Activity (ERA) and does not authorise any environmental harm unless a condition stated by the authority specifically authorises environmental harm. The conditions of the EA stipulate requirements for surface water release limits, treatment of stormwater runoff from disturbed areas amongst other matters. The Site Based Management Plan incorporates management measures for stormwater, air quality, noise, vibration, weeds and vegetation clearing to ensure compliance with the conditions of the EA as discussed above in relation to the koala. Compliance with the conditions of the EA is monitored and enforced by the Department of Environment and Heritage Protection, accordingly it is considered that the proposed management measures contained within the Site Based Management Plan will be effective and reviewed regularly. Following the implementation of the management measures outlined in the Site Based Management Plan it is considered that the proposed action is unlikely to impact on the ecological values of surrounding habitat.

4.4 Rehabilitation

The DotE request for additional information has asked for the following information:

"a detailed description of any proposal to rehabilitate temporarily disturbed areas or retain open spaces (also addressing management, methodology, timing, duration, effort and likely effectiveness)"

In relation to rehabilitation of the extraction footprint, if approval is granted for the extension of the Wolfdene Quarry it will be operated pursuant to an Environmental Authority (EA) issued by the Department of Environment and Heritage Protection under the *Environmental Protection Act 1994* (EP Act). The EA authorises the carrying out of an Environmentally Relevant Activity (ERA) subject to specific conditions which requires land that has been disturbed to be rehabilitated. The Site Based Management Plan incorporates rehabilitation management measures to ensure compliance with the conditions of the EA. As is current practice with the existing quarry, rehabilitation will be undertaken progressively throughout the life of the activity. Initially, rehabilitation will focus on rehabilitating terminal batters once final limits are reached and batters of sediment basin(s) and any clean water catchment diversion channels and/or diversion banks are finalised. Rehabilitation of the quarry floor will commence following terminal batter formation, subject to meeting safety expectations and once areas become available following the cessation of quarrying activities. The timing of rehabilitation, being in line with the rate of extraction, will also depend on market and general economic and climatic conditions. Refer to Figure 9 – Rehabilitation Staging of the Site Based Management Plan for the anticipated order of rehabilitation works. It should be noted that Hanson's leading practice rehabilitation methods through natural regeneration were recognised by the industry during the 2011 Cement Concrete and Aggregates Australia (CCAA) Queensland Environmental Health and Safety Awards where Hanson received the Environmental Award for innovation. Compliance with the conditions of the EA is monitored and enforced by the Department of Environment and Heritage Protection, accordingly it is considered that the proposed management measures contained within the Site Based Management Plan (which will be updated prior to commencement of the activity) will be effective and reviewed regularly.

4.5 Exclusion zones / buffer zones

The DotE request for additional information has asked for the following information:

"a map(s) which illustrates the location(s) of any proposed construction exclusion zones or buffer zones, and details on how these areas will be excluded, or protected"

Refer to Drawing No. 1001.285 – Proposed Action and 1001.280R4 – MNES for Proposed Impact and Offset Areas which detail the proposed extraction footprint, offset and buffer areas. As discussed in the Site Based Management Plan the extent of the extraction footprint will be surveyed and markers, flagging or fencing installed to identify the limit of disturbance to protect the offset and buffer zones. As rehabilitation of the extraction footprint will occur progressively, areas under rehabilitation will be protected in a similar manner.

4.6 Timeframes

The DotE request for additional information has asked for the following information:

"associated timeframes for undertaking proposed mitigation measures (i.e. duration and timing of implementation). This must be addressed for both the construction phase and operational/ongoing life of the development"

As discussed previously, the proposed action is an extension of an existing quarry and there is not a 'construction phase' and the mitigation and management measures will be carried out continually for the life of the quarry which is expected to be for at least the next 80 to 100 years.

4.7 Maintenance and monitoring programs

The DotE request for additional information has asked for the following information:

"details of proposed maintenance and monitoring programs to help limit the impacts of the action on matters of national environmental significance. These must include, but not be limited to:

- *management programs, including erosion, sediment and runoff controls, water quality testing and other measures to maintain or enhance habitats in the vicinity of the action; and*
- *details of ongoing research and monitoring programs to support an adaptive management approach and determine the effectiveness of the proposed mitigation measures."*

The protection of the offset and buffer areas will in part be addressed by management measures within the Site Based Management Plan such as the weed management and stormwater, erosion and sediment control measures. However, additional management plans will be prepared for the offset and buffer areas to address the specific management actions that will be required to be implemented in those areas. As discussed previously the Site Based Management Plan incorporates the management and monitoring plans for the site in accordance with the conditions and obligations stipulated by the EA for the site. For example, in relation to stormwater management, measures to be taken to minimise the potential for contamination of stormwater overland flow from Site are as follows:

- Construct access road(s) at ground level and using compacted base coarse where necessary.
- Consider construction of hardstand areas using compacted base coarse with a cover of gravel mulch where practicable.
- Prevent, and where not possible to prevent, minimise the contact of incident rainfall and stormwater runoff with wastes or other contaminants.
- Clean up any spillage of wastes, contaminants or other materials as quickly as practicable.
- Direct all surface water runoff from the areas utilised for the operation and product stockpiles to the quarry pit, sediment basin or excavated sediment trap for treatment before being released.
- Recycle waters collected in the sediment dam, excavated sediment trap or quarry pit(s) to the maximum extent practical (e.g. dust suppression and watering rehabilitated areas).
- Undertake any necessary on-site maintenance in an area where contaminants cannot be released to surrounding receiving waterways or on-site sediment basin(s) or excavated settling traps.
- Store all hazardous materials, chemicals and food product wastes generated on-site under cover or with appropriate safeguards.
- Undertake rehabilitation of disturbed areas and final batters progressively to the extent practicable; and
- Dispose of wastes off-site on a regular basis.

Again, for example, the Site Based Management Plan directs that the effectiveness of the stormwater management measures are to be monitored as follows:

- The Quarry Manager shall carry out monthly surveillance of on-site water storages and treatment systems.
- Inspection of Site water storages and treatment systems shall also be carried out by the Quarry Manager immediately prior to anticipated runoff-producing rainfall and as soon as practicable following the event.
- The inspections should consider:
 - condition of banks and batters
 - condition of inlet and outlet zones, including structure integrity, possible clogging, excessive sediment deposition or erosion
 - flows entering non-operational areas
 - pollutant levels within any treatment devices
 - weed infestation.
- The Quarry Manager may engage the services of a suitably qualified and experienced person to conduct the water quality sampling and review monitoring results to provide advice in relation to the water quality management if a complaint is received or requested by the administering authority.
- Any surface water sampling will be undertaken in accordance with the EHP's *Monitoring and Sampling Manual, September 2009* or subsequent editions.

5. Proposed Offsets

The DotE request for additional information has asked for the following information:

"The Preliminary Documentation must provide information on any offset measures proposed to compensate for residual significant impacts to matters of national environmental significance. This section should consider (but need not be limited to) potential offset requirements for the Koala."

5.1 Proposed offsets

The DotE request for additional information has asked for the following information:

- *"a detailed description of the offset(s), such as how, when and where the offsets will be delivered and managed;*
- *details of how the offset(s) will compensate for the residual significant impact(s) upon matters of national environmental significance, resulting from the action;*
- *a description of how the offset(s) will ensure the protection, conservation and management of the relevant matters of national environmental significance, for the duration of the impact;"*

It is important to note that the extent of the proposed expansion (i.e. clearing) area has been refined on a number of occasions in response to ecological advice. This has been done in an effort to avoid, mitigate and minimise potential environmental impacts. The residual significant impact of the activity as shown on Drawing No. 1001.280R4 – MNES for Proposed Impact and Offset Areas is the extent of clearing of MNES habitat in the extension land of 112.75ha. As previously discussed assessments by Gondwana advise that the extension land is considered to contain koala habitat, but that habitat is considered to be low value and low usage.

Refer to Drawing No. 1001.285 – Proposed Action and 1001.280R4 - MNES for Proposed Impact and Offset Areas which identify the proposed offset and buffer areas. The proposed offset areas are within allotments currently owned by Hanson and adjacent to the proposed impact areas. The offset areas are proposed to be placed in a covenant with the development of a suitable offset management plan. It is proposed that the offset management plan would be prepared at a later date as the State Government also requires an offset management plan to be prepared as a condition of approval of the EA for the site. The offset management plans and covenants would be secured prior to commencement of the use and activity in the extension land. However, it is anticipated that management measures would include but not necessarily be limited to, fencing, weed control, minor drainage line restoration, replanting if appropriate and annual monitoring to inform ongoing management actions. For example, the cleared areas adjacent to the waterway traversing Lot 3 SP244693 in the northern offset area would provide opportunities to replant Koala food trees in areas previously cleared through historical cattle grazing activities.

The covenant would be in accordance with the guidelines and requirements of the department. We expect that the covenant would be permanent and registered on title binding all successors in title and referring to an offset management plan to be approved by the department. The covenant would restrict activities in the offset area to only those consistent with the approved offset management plan. It is anticipated that the offset management plan would identify any monitoring and reporting requirements.

As shown on Drawing No. 1001.280R4 - MNES for Proposed Impact and Offset Areas the extent of clearing of MNES habitat in the extension land is 112.75ha. The area proposed as an offset (three separate patches) for the land to be cleared lies within an area in the south approved for clearing (i.e. Approved Quarry Area) and within land owned by Hanson to the north of the clearing area and comprises 123.87ha. It is also proposed to incorporate the proposed buffer lands of 57.09ha and manage those buffer lands to see an overall biodiversity value improvement to strength the linkages and connectivity to surrounding land. Accordingly, the proposed activity will result in a total of 180.96ha of land owned by Hanson being protected under covenant and managed through an offset management plan throughout the life of the quarry which is anticipated to continue for at least 80 to 100 years.

As previously discussed the detailed survey (Gondwana Ecology 2014) identified a number of vegetation communities in the extension land. Within the area to be cleared a mixed open sclerophyll forest is dominant with *Corymbia citriodora* along ridges and upper slopes commonly associated with *Eucalyptus siderophloia*. An open forest community with *Lophostemon confertus* and *Eucalyptus propinqua*, becomes more common on lower slopes and in the drainage lines, which are heavily

impacted with weeds (e.g. Lantana and Molasses Grass). A number of species have been recorded within the allotments associated with the area to be cleared as previously reported and as part of the recent (2014) surveys, as follows:

- Macadamia Nut (*Macadamia integrifolia*) – population located in the southwest of Lot 80 and isolated individuals along the creek. This area is proposed for retention and protection with a buffer. Potential habitat for this species occurs along the riparian and vine thicket associated with the waterway/drainage line in the west.
- Koala (*Phascolarctos cinerus*) – a number of comprehensive surveys over many years has failed to record (visual) a koala within the area to be cleared (i.e. Lot 80 or Lot 2). Evidence (scat) of koala was recorded (2013 and 2014). Potential habitat for this species occurs throughout the landscape. Land associated with the lower slopes and flat country (associated with the waterway and farmland in the west) is considered preferred, with more abundant suitable food species (e.g. *E.tereticornis*) and higher water/nutrient content (i.e. associated with alluvial landscapes).
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – no records for this species have been recorded to date within the local area. Potential foraging habitat for this species would be expected within flowering eucalypt, riparian and rainforest communities throughout the landscape.

In relation to the biodiversity values of the proposed offset areas, three closely associated areas are proposed for offset in the south of the site totalling 56.53ha as well as the area to the north which is 67.33ha. It is noted that the northern offset area contains vegetation communities consistent with those found in the areas proposed for clearing discussed above with the variation that the lower areas adjacent to the existing creek contain higher quality Koala habitat being more nutrient soils than what is found on the upper slopes in the extension land. Site inspections (2012 and 2014) have confirmed that the majority of the proposed offset area in the south is dominated by a mixed open sclerophyll forest is dominant with *Corymbia citriodora* along ridges and upper slopes commonly associated with *Eucalyptus siderophloia*. An open forest community with *Lophostemon confertus* and *Eucalyptus propinqua*, becomes more common on lower slopes and in the drainage lines. Patches of Notophyll vine forest with few emergent *Araucaria cunninghamii* occurs within the offset areas. This vegetation community could be considered analogous to the Commonwealth EPBC Act listed threatened ecological community (Lowland Rainforest of subtropical Australia). The State has mapped the community as RE 12.11.10 in parts and it is also not mapped in some offset areas. The site inspections confirmed that the extent within the proposed offset area is greater than that mapped. The offset area also supports an 'of concern' *Eucalyptus tereticornis* open forest community in the southeast and southwest. Patches of non-remnant vegetation are included in the offset area. These areas are dominated by wattle regrowth and Lantana. A number of species have been recorded within the southern area, as follows:

- Macadamia Nut (*Macadamia integrifolia*) – extensive population/s in the southeast of Lot 2 associated with the vine thicket but also in surrounding areas. Individuals and small population in the southeast and associated with the adjacent land. Population also identified adjacent to the western offset.
- Koala (*Phascolarctos cinerus*) – no records for this species within the offset portion of Lot 2. Evidence (scratches) of koala was recorded within Lot 2 during July and October 2014. Potential habitat for this species occurs throughout the landscape. The 'of concern' RE mapped in the southeast of the proposed offset area is an *E.tereticornis* community. This species is a known preferred feed tree for koala.
- Grey-headed Flying-fox (*Pteropus poliocephalus*) - no records for this species have been recorded to date within the local area. Potential foraging habitat for this species would be expected within flowering eucalypt, riparian and rainforest communities throughout the proposed offset areas.
- Ormeau Bottle Tree (*Brachychiton* sp.) – this species was recorded in the southeast of the proposed offset area.

Given the diversity and structure of the vegetation in the proposed offset area, it is possible that habitat (or potential habitat) occurs for other threatened species (e.g. Spotted-tailed Quoll, Red Goshawk, Swift Parrot, Grey Goshawk, Regent Honeyeater, Minute Orchid, Spiny Gardenia, Birdwing Vine, Shiny-leaved Condoo, Giant Ironwood, Shrubby Jasmine, Native Jute). This is primarily within the vine thicket/rainforest communities of both the western and eastern offset patches. There are known records of Shiny-leaved Condoo and Shrubby Jasmine in the land to the immediate southeast. Considering the above information it is important to note the following regarding the proposed offset areas:

- Supports a higher (significantly) number of threatened species (particularly plants, but also fauna and habitat) confirmed through field surveys.
- Supports a greater diversity of habitats/vegetation communities, including vine thicket (and potential threatened ecological community) confirmed through field surveys.
- Is located adjacent and contiguous with other areas of environmental/biodiversity value.
- Supports tree species known to be preferred by koala (i.e. *E.tereticornis*).
- Supports large hollow-bearing trees and stags confirmed through field surveys.
- Opportunities exist to enhance parts of the offset through weed control and target revegetation with suitable species, including threatened plants.

With the commitment to include the buffer areas as part of the offset package the proposed activity will allow for the retention and protection of ecological values that are equivalent, if not superior to the area proposed for clearing.

5.1.1 Additional information following public comment period

During the public comment period the DotE advised that additional information clarifying certain matters would be of assistance to the assessment of the proposed action by DotE. The matters for which clarification was sought included the following.

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

Whilst the proposed offset areas described in this Preliminary Documentation report, are primarily provided to address impact to koala habitat, it is possible that the offset areas also contain habitat for other threatened species including the Grey-headed Flying-fox. Accordingly, the proposed offset areas for koala would also address any potential residual impact to the Grey-headed Flying-fox.

Offset Management Plan

It is proposed to prepare the necessary offset management plan and associated covenant post approval. As previously discussed with the DotE the Queensland Government has also required the provision of a offset management plan as a condition of the Environmental Authority (EA) issued under the *Environment Protection Act 1994* (EP Act). The Gold Coast City Council have also expressed a desire be consulted in the preparation of any offset management plan on the basis that it will include the quarry buffer lands required to satisfy the interests of Council. As the purpose of the offset required by the Queensland Government and the DotE are primarily the same, i.e. koala habitat, it is preferred that the offset management plan satisfies both levels of Government to avoid duplication and complexity of management measures. This is particularly important when considering the time period over which the proponent is committing to manage the offset areas. It is anticipated that some time will be required to prepare such a document and liaise with all levels of Government prior to submission for approval. Accordingly, given the length of time taken to date to secure the relevant approvals at a Local, State and Commonwealth Government level, it is requested that the DotE consider proceeding with the assessment and require the submission of the offset management plan and covenants as a post approval matter.

5.2 Offset Assessment

The EPBC Act environmental offsets policy provides a tool to assist in determining the suitability of an offset proposal. Using the guide and policy, a range of parameters were required to calculate the suitability of the offset. These parameters have been based on the comprehensive field work undertaken by Gondwana. The offset package has been developed to satisfy the requirements of the EPBC Offset Assessment Guide. Table 2 and 3 on the following pages provide justification for the proposed offset strategy in accordance with the EPBC Offsets Calculator.

Table 2 – Applicable Attributes to the EPBC Act Environmental Offsets Policy for Koala – Offset Area

Impact calculator attribute	Impact calculator input	Comment
Threatened species habitat	Koala (<i>Phascolarctos cinereus</i>)	Field validation of habit was conducted by Gondwana. The habitat identified on site meets the criteria for consideration as habitat critical to the survival of the species.
Area of impact (ha)	113ha	The impact area contains approximately 112.75ha of intact vegetation that meets the criteria for consideration as habitat critical to the survival of the species.
Current quality of habitat	7	Using the Koala habitat assessment tool the vegetation of the impact area recorded a score of 6. However, from an abundance of caution a score of 7 has been adopted for the calculator input.
Total quantum of impact (ha)	79.1ha	Adjusted hectares as per EPBC Offsets Calculator.
Proposed offset	123.87ha	A management plan will be prepared for the offset area to guide the implementation of the management actions on an ongoing basis.
Risk related time horizon (years)	20	Considering that the risk related time horizon value is the number of years that the offset is expected to be in place, the maximum time of 20 years was chosen.
Time until ecological benefit (years)	10	Conservation gains will be achieved over both the short term and long term. Accordingly, from an abundance of caution 10 years has been adopted.
Start quality of offset	7	Limited evidence of koala has been recorded within the offset area despite significant survey effort over several years. It is considered possible that koalas in low numbers may utilise the site on an infrequent basis. The offset area contains suitable habitat for koala and will establish connectivity around the proposed extraction footprint that is not otherwise envisaged by Council's planning scheme.
Future quality without offset	6	Without the inclusion of the offset area and the resulting management actions, there is a high probability that the quality of habitat will be reduced, as it is anticipated that cattle grazing would continue to occur and would lead to habitat degradation over the long term resulting in a decline of habitat value.
Future quality with offset	8	The proposed offset will secure 123.87ha of koala habitat under covenant. The proposed offset area will be managed by the land owner and operator of the quarry which is anticipated to continue for the next 80 to 100 years. Proposed management actions will maintain the extent of the koala habitat in perpetuity. Proposed management actions will increase the overall condition and quality of the koala habitat through weed control, exclusion of cattle, and where appropriate re-planting of koala food trees, and this will provide an overall positive outcome for the koala. A detailed offset management plan would be developed prior to the commencement of the activity to identify areas to be addressed and the specific management measures to be employed to achieve the improvement in habitat value.
Risk of loss without offset (%)	95%	The extension land is zoned within the Extractive Industry zone of the Council's planning scheme which describes the intent for the precinct is to ensure the continuation of economically viable quarrying activities. The extension is also determined to be a resource of state or regional significance being identified as a Key Resource Area by the Queensland State government.
Risk of loss with offset (%)	5%	The risk of losing the potential koala habitat once secured under covenant is effectively Zero (0). However, from an abundance of caution a value of 5% has been adopted.
Raw gain	2.00	As per EPBC Offsets Calculator
Confidence in result (%)	85%	A high degree of confidence in the conservation outcomes is achieved through Hanson's track record of environmental responsibility and stewardship and the knowledge that the offset area is under the same land ownership as the quarry which is anticipated to continue operation for at least the next 80 to 100 years.
Adjusted gain	1.60	As per EPBC Offsets Calculator
Net present value	73.81ha	As per EPBC Offsets Calculator
Total % residual impact	93.52%	As per EPBC Offsets Calculator. Remaining value to be offset through uplift of buffer areas. Refer to Table 3 below.

Table 3 – Applicable Attributes to the EPBC Act Environmental Offsets Policy for Koala – Buffer Lands

Impact calculator attribute	Impact calculator input	Comment
Threatened species habitat	Koala (<i>Phascolarctos cinereus</i>)	Field validation of habit was conducted by Gondwana. The habitat identified on site meets the criteria for consideration as habitat critical to the survival of the species.
Area of impact (ha)	113ha	The impact area contains approximately 112.75ha of intact vegetation that meets the criteria for consideration as habitat critical to the survival of the species.
Current quality of habitat	7	Using the Koala habitat assessment tool the vegetation of the impact area recorded a score of 6. However, from an abundance of caution a score of 7 has been adopted for the calculator input.
Total quantum of impact (ha)	79.1ha	Adjusted hectares as per EPBC Offsets Calculator.
Proposed offset	57.09ha	The buffer areas will be incorporated within the covenant and management plan that will be prepared for the offset area to guide the implementation of the management actions on an ongoing basis.
Risk related time horizon (years)	20	Considering that the risk related time horizon value is the number of years that the offset is expected to be in place, the maximum time of 20 years was chosen.
Time until ecological benefit (years)	10	Conservation gains will be achieved over both the short term and long term. Accordingly, from an abundance of caution 10 years has been adopted.
Start quality of offset	7	Limited evidence of koala has been recorded within the buffer land despite significant survey effort over several years. It is considered possible that koalas in low numbers may utilise the site on an infrequent basis. The buffer land contains suitable habitat for koala and will establish connectivity around the proposed extraction footprint that is not otherwise envisaged by Council's planning scheme.
Future quality without offset	6	Without the inclusion of the offset area and the resulting management actions, there is a high probability that the quality of habitat will be reduced.
Future quality with offset	8	The buffer land is proposed to be secured under covenant as part of the proposed offset thereby securing an additional 57ha of koala habitat. The buffer land will be managed by the land owner and operator of the quarry which is anticipated to continue for the next 80 to 100 years. Proposed management actions will maintain the extent of the koala habitat in perpetuity. Proposed management actions will increase the overall condition and quality of the koala habitat through weed control and where appropriate re-planting of koala food trees, and this will provide an overall positive outcome for the koala.
Risk of loss without offset (%)	5%	The buffer land is unlikely to be cleared as it serves as a buffer to the existing quarry activities.
Risk of loss with offset (%)	5%	The risk of losing the potential koala habitat once secured under covenant is effectively Zero (0). However, from an abundance of caution a value of 5% has been adopted.
Raw gain	2.00	As per EPBC Offsets Calculator
Confidence in result (%)	100%	A high degree of confidence in the conservation outcomes is achieved through Hanson's track record of environmental responsibility and stewardship and the knowledge that the offset area is under the same land ownership as the quarry which is anticipated to continue operation for at least the next 80 to 100 years.
Adjusted gain	1.60	As per EPBC Offsets Calculator
Net present value	8.51ha	As per EPBC Offsets Calculator
Total % residual impact	10.75%	As per EPBC Offsets Calculator.

The combined residual impact of the offset area (93.52%) and buffer land (10.75%) is 104.27% satisfying the offset policy.

5.3 Legislative requirements

The DotE request for additional information has asked for the following information:

"a description of how the offset(s) are consistent with relevant Commonwealth policies and guidance documents on offsets under the EPBC Act."

The proposed offset is consistent with the relevant Commonwealth policies and guidance documents on offsets on the following basis:

- The proposed conservation outcome improves or maintains the viability of the protected matter (koala habitat);
- The proposed conservation outcome is based upon a direct offset of 180.96ha of land adjacent to the impact area and under the ownership of Hanson;
- The proposed conservation outcome is proportionate to the residual impacts on the protected matter (koala habitat) being considered to be 104.27% of the impact in accordance with the offset calculator;
- The risk of the offset not succeeding will be accounted for through a covenant and management plan which is to be prepared taking into account that the activity will continue for at least 80 to 100 years;
- The proposed offset is additional to the requirements of other planning regulations;
- The proposed offset is:
 - Efficient – being adjacent to the proposed impact area.
 - Effective – containing the same habitat as well as additional protected matters not found in the impact area.
 - Timely – being secured prior to commencement of the impact and to be maintained for the duration of the activity.
 - Transparent – being physical land owned by Hanson that will be protected under covenant.
 - Scientifically robust – being based on numerous studies and assessment conducted by suitably qualified persons.
 - Reasonable – being equivalent to the significant residual impact on the protected matter (koala habitat).
- The proposed offset will have transparent governance arrangements which will be determined in consultation with DotE officers during the preparation of the covenant documentation and the offset management plan.

5.4 Anticipated cost

The DotE request for additional information has asked for the following information:

"the anticipated cost (financial and other) of delivery the offset(s)."

On the basis that the offset involves land already owned by Hanson the anticipated cost of the delivery of the offset will primarily be associated with management of the areas over the long term (80 to 100 years) including for example but not limited to initial planting, maintenance and weed management measures. A majority of the costs (e.g. maintenance and weed management) are already carried by Hanson as the land owner. Detailed costs will be calculated as part of the preparation of the management plan.

6. Social and Economic

The DotE request for additional information has asked for the following information:

"Information on the economic and social impacts of the proposed action, both positive and negative, must be provided. Economic and social impacts should be considered at the local, regional and national levels."

The proposed development seeks to realise the full potential of a proven high quality hard rock extractive resource, to supply the South East Queensland region (including Council, State road and rail construction projects) with essential quarry materials and thereby support and enhance the economic viability of the region. The proposed development has been recognised by State and Local Governments for its significance as a strategic quarry resource. Extractive materials are a key component of construction materials, without which our roads, buildings and schools could not be built. Aggregates are used in concrete which is one of highest tonne per capita consumed commodities in the world, second only to food. The Queensland State Government has identified the need to manage growth in South East Queensland which has experienced high and sustained growth since the 1980's. A number of strategies have been put in place to manage the anticipated growth including the South East Queensland Regional Plan 2009 – 2031 (SEQ Regional Plan) and the Infrastructure Plan and Program. It is expected that the increased population will translate to an increase in infrastructure and construction activity in South East Queensland which in turn will increase demand for quarry products. The inclusion of additional land within the existing quarry footprint will provide access to higher quality resources and improve the efficiency of the quarry operations ensuring that the quarries significant contribution to the region can continue for the next 80 to 100 years.

7. Other Approvals and Conditions / Prior Authorisation

7.1 Approvals / authorities

The DotE request for additional information has asked for the following information:

- *"a description of any approval that has been obtained or is required to be obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the EPBC Act), including any conditions that apply (or are reasonably expected to apply) to the action;"*
- *a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action;*
- *written confirmation from the relevant local and/or state government authority/authorities to confirm that the areas of the project site that may have prior authorisation under Section 43A of the EPBC Act may proceed based on environmental authorisations received prior to the implementation of the EPBC Act;"*

7.1.1 Approval by the State and Local Government

In relation to the approvals required from State or Local government authorities and monitoring, enforcement and review procedures likely to be associated with those approvals we provide the following information. Development approval (DA) under the *Sustainable Planning Act 2009* (SPA) is required, as is an Environmental Authority (EA) under the *Environmental Protection Act 1994* (EP Act). The DA has been applied for and the application is currently in the Decision Making Stage. The Council is the assessment manager and has received the required concurrence agency notice from the Department of State Development, Infrastructure and Planning. The Council has advised that a decision on the application will be held until greater certainty is reached in relation to this assessment under the EPBC Act. The EA (refer Attachment 5 – Environmental Authority under the Environmental Protection Act 1994) has been granted by the Department of Environment and Heritage Protection but is not yet in effect as it is tied to the development approval yet to be granted by Council.

7.1.2 Monitoring, enforcement and review procedures likely to apply

The EA granted by the State (but not yet in effect) under which the activity would be operated includes the following monitoring, enforcement and review procedures of interest to the DotE:

- An offset management plan is to be prepared and approved and the offset legally secured prior to clearing commencing in the extension land.
- All reasonable and practicable measures must be taken to minimise the likelihood of environmental harm being caused;
- The activity must be undertaken in accordance with written procedures that identify potential risks to the environment and establish and maintain control measures that minimise the potential for environmental harm and requires annual review of environmental performance;
- Conditions establishes surface water release limits, noise limits and blasting limits;
- Conditions also requires that land which has been disturbed must be rehabilitated progressively in a manner that uses suitable native species, minimises potential for erosion, does not cause environmental harm and the final landform is stable and protects public safety.

It is anticipated that any approval granted by the Council would incorporate conditions similar and consistent to those in the EA and addressing the following matters of interest to the DotE:

- Covenant to be registered to preserve protected vegetation
- Covenant management plan to be prepared and approved
- Rehabilitation management plan to be prepared and approved
- Engagement of and assessment by spotter-catcher prior to any clearing activities
- Development Approval for Operational Works (Tree Clearing) to be obtained for each stage.

7.1.3 Evidence of Prior Authorisation

In relation to the matter of Section 43A of the EPBC Act we understand that specific item has been requested because the referral advised that a portion of the site known as the Pioneer Quarry (Lot 2 RP167150, Lot 1 CP893562 and Lot 1 CP893559) holds prior authorisation under Section 43A of the EPBC Act. We are of that understanding on the basis that immediately prior to the commencement of the EPBC Act (16 July 2000) all necessary 'specific environmental authorisations'

to allow the Pioneer Quarry to be undertaken lawfully were held and continue to be in force. Letters have been obtained as requested from the Department of State Development, Infrastructure and Planning (refer Attachment 6 – Letter from Department of State Development, Infrastructure and Planning) and the Council (refer Attachment 7 – Letter from Gold Coast City Council). As further justification and evidence that Section 43A of the EPBC Act applies to the operations conducted over the site known as the Pioneer Quarry, we provide the following information.

The current application

The DotE have noted that the Pioneer Quarry land is included within the current development application for extension of the Hanson Wolfdene Quarry submitted to the Council and State Government and in the referral under the EPBC Act. The Pioneer Quarry land had to be included in the land forming part of the development application for extension because the *Sustainable Planning Act 2009* requires that all land forming part of the use must be included in an application. The existing crushing and screening plant and other essential infrastructure is located on the Pioneer Quarry land and will be relied upon for the processing of material extracted from the extension land. Because the Pioneer Quarry land is relied upon for existing infrastructure an application over only the extension land could not be made. Nevertheless, the environmental impacts of the existing quarry operations have not been reassessed as part of the application for the extension land. The assessment by Council and the State Government is focused on the assessment of new impacts resulting from the proposed extension because all necessary approvals are already held for the existing operations. Similarly, all of the land was included in the referral under the EPBC Act because the Pioneer Quarry land will provide land for environmental offsets and therefore forms part of the action.

The relevant legislation

Section 43A of the EPBC Act states,

- (1) A person may take an action described in a provision of Part 3 without an approval under Part 9 for the purposes of the provision if:
- a) the action consists of a use of land, sea or seabed; and
 - b) before the commencement of this Act, the action was authorised by a specific environmental authorisation; and
 - c) immediately before the commencement of this Act, no further specific environmental authorisation was necessary to allow the action to be taken lawfully; and
 - d) at the time the action is taken, the specific environmental authorisation continues to be in force.

- (1A) For the purposes of paragraphs (1)(c) and (d), a renewal or extension of a specific environmental authorisation is taken to be a new specific environmental authorisation unless:
- a) the action that is authorised by the authorisation following the renewal or extension is the same as the action that was authorised by the authorisation before the commencement of this Act; and
 - b) the renewal or extension could properly be made or given without any further consideration of the environmental impacts of the action.

Note: If a renewal or extension of a specific environmental authorisation is taken to be a new specific environmental authorisation, the condition in paragraph (1)(c) or (d) would not be met.

(2) In this Act:

environmental authorisation means an authorisation under a law of the Commonwealth, a State or a self-governing Territory that has either or both of the following objects (whether express or implied):

- a) to protect the environment;
- b) to promote the conservation and ecologically sustainable use of natural resources.

specific environmental authorisation means an environmental authorisation that:

- a) identifies the particular action by reference to acts and matters uniquely associated with that action; or
- b) was issued or granted following a consideration of the particular action by reference to acts and matters uniquely associated with that action.

We understand that the legislation in effect immediately prior to 16 July 2000 with potential application to quarries, which could result in the grant of an 'environmental authorisation' were:

- a) the *Integrated Planning Act 1997* (IPA) (which was in effect at the relevant time, but has now been replaced with the *Sustainable Planning Act 2009* (SPA) and which transitioned approvals granted under the previous *Local Government (Planning and Environment) Act 1990* (P&E Act) and *Local Government Act 1936*;

- b) the *Environmental Protection Act 1994* (EP Act) which, both in 2000 and currently, required that an environmental authority be held for environmentally relevant activities (ERAs) including extractive industry and associated activities such as crushing and screening. The objectives of this Act include ecologically sustainable development;
- c) the *Vegetation Management Act 1999* (VM Act) had not yet commenced on 16 July 2000 (the substantive provisions of that Act commenced in September 2000);
- d) The *Nature Conservation Act 1992* (NC Act) also has objectives of the relevant type and triggers the need for approval to take protected plants (unless an exemption applies).

The planning approvals

A development approval granted in 2011 (Council Ref: PN131878/01/DA2) included the land associated with the Pioneer Quarry, however that 2011 development approval has not yet been acted on and an extension of the period of that approval has been granted to preserve it for a further four (4) years. Accordingly, as the 2011 development approval has not been acted on it is not relevant in this instance and will not be considered further.

The Pioneer Quarry was established subsequent to the following approvals:

- Rezoning Application No 676
- Town Planning Consent Application No 1141

We understand that the rezoning and consent were granted in 1981 and we have been advised that operations subsequently commenced in 1981 within the prescribed period in accordance with Condition 14 of the consent. A review of the conditions of the rezoning and consent confirm that no subsequent or related development approvals were required to enable the use to continue operation after it had lawfully commenced. Accordingly, we understand that immediately prior to 16 July 2000 the rezoning and consent were in effect and continue to be in effect authorising the continued operation of the quarry within Lot 2 RP167150, Lot 1 CP893562 and Lot 1 CP893559. The provisions of the P&E Act, IPA and SPA recognise a lawful use of premises and direct that a new planning instrument or amendment to a planning instrument can't further regulated the existing use. Accordingly, we understand that the rezoning and consent remain in force and effect and as they can't be further regulated by planning instruments such as the current planning scheme no additional development approvals (for example Operational Work – Vegetation Clearing) are required from Council.

The environmental approvals

As noted above the VM Act had not yet commenced prior to 16 July 2000 and therefore is not required to be considered.

We have been advised that Environmental Authority SR197 (EA) (refer *Attachment 8 – Environmental Authority SR197*) was obtained in response to the commencement of the EP Act and later amended on 11 May 2000. The amended EA remains in effect. Accordingly, we are of the understanding that the necessary approval under the EP Act was held immediately before the EPBC Act commenced and has continued to be held.

The NC Act might be considered to be relevant. Accordingly, we have considered if immediately prior to the commencement of the EPBC Act there was a requirement for any approval pursuant to the NC Act. Section 89.(1) of the NC Act (Reprint No.2D dated 4 July 2000) states:

Subject to section 93, a person must not take a protected plant, other than under
(a) a conservation plan applicable to the plant; or
(b) a licence, permit or other authority issued or given under a regulation;
(c) an exemption under a regulation.

Section 109A.(1) of the *Nature Conservation Regulation 1994* (Reprint No.2C dated 5 July 2000) states:

A person does not need a clearing permit to take a protected plant if—
(a) the taking happens in the course of an activity under an authority made, issued or given—
(i) under another Act by—
(A) the Governor in Council; or
(B) someone else and the chief executive agrees to the taking in the course of the activity; or
(ii) by a local government under the Local Government (Planning and Environment) Act 1990;

The *Local Government Act 1936* was in effect when the rezoning and consent were granted. For clarity, Section 8.10(8) of the P&E Act (Reprint No.2A dated 6 January 1998) states;

(8) Each approval, consent or permission (but not any conditions attaching to the approval, consent or permission) granted by a local authority or the Governor in Council prior to the commencement of this Act, is to continue to have force and effect as if it were an approval, consent or permission, as the case may be, made pursuant to this Act (but any conditions attaching to the approval, consent or permission are still to apply as if this Act had not commenced).

Accordingly we are of the understanding that the rezoning granted by the Governor in Council and consent granted by Albert Shire Council are relevant authorities for the purpose of the regulation. Therefore activities associated with the rezoning and consent would have exemption from obtaining a permit under the NC Act immediately prior to the commencement of the EPBC Act.

Based on the above information the rezoning, consent and EA held for the Pioneer Quarry were in effect immediately prior to the commencement of the EPBC Act and are considered current. Therefore, no additional approvals were required for the continued operation of the Pioneer Quarry under the relevant legislation in place immediately prior to the commencement of the EPBC Act because:

- A rezoning and consent was in effect which did not require further subsequent development approvals to be obtained after the commencement of the use;
- IPA directed that existing use rights could not be further regulated;
- An environmental authority under the EP Act was held;
- The VM Act was not yet in effect; and
- An exemption from the NC Act was held.

Accordingly, the portion of the site known as the Pioneer Quarry (Lot 2 RP167150, Lot 1 CP893562 and Lot 1 CP893559) which is currently operated as the existing Hanson Wolfdene Quarry holds prior authorisation under Section 43A of the EPBC Act.

8. Public Comment

As previously advised the proposed action was published in accordance with the directions provided in the letter dated 20 July 2015 from the Department of the Environment (DotE). During the public consultation period 2 letters were received. The matters raised in the 2 letters do not warrant changes to the proposed action and Preliminary Documentation for the proposed action. We have summarised the matters raised and our comment in response in Table 4 and 5 below.

Table 4 – Summary of and Response to 1st Public Comment Letter

Matter	Summary of public comments	Response
1	<p><i>The comments noted the importance of the wild Macadamia Nut (Macadamia integrifolia) population identified by the documentation for the proposed action.</i></p> <p><i>It is noted that the comments were based on the initial referral documentation and specifically Figure 3 Proposed quarry expansion (Figure 3) prepared by the Gondwana Ecology Group.</i></p> <p><i>The comments commended the inclusion of the majority of the population of Macadamia Nut within the buffer lands but considered that a 50m buffer to habitat on the creek traversing the western portion of Lot 80 on CP893560 is insufficient and should be increased to 100m. The comments requested active management of the buffer lands containing the population of wild Macadamia Nut and recommended that Hanson consider propagation of the existing wild Macadamia Nut to expand the existing populations.</i></p> <p><i>The comments requested clarification on potential impacts from hydrological changes resulting from the proposed action on the wild Macadamia nut population. Particularly the population identified in the south western corner of Lot 80 CP893560 adjacent to the existing and proposed extraction footprint but within habitat to be retained.</i></p>	<p>It is understood from telephone discussions on 18 August 2015 that the comments made in the 1st letter relied only upon the initial referral documentation and had not viewed and considered the further refinements to the proposed action described in the Preliminary Documentation report. Specifically, the authors were not aware of Drawing No. 1001.280r4 – MNES for Proposed Impact and Offset Areas within the Preliminary Documentation report which describes the reduction of the proposed quarry footprint, inclusion of offset areas and the incorporation of the buffer lands within the on-going management measures to be addressed by the future offset management plan.</p> <p>All known populations of the wild Macadamia Nut within the extension land have been included within the proposed buffer lands and 'habitat to be retained' shown on Drawing No 1001.280r4. The buffer to the wild Macadamia Nut population within the creek traversing the western portion of Lot 80 on CP893560 was requested by the Gold Coast City Council information request letter dated 26 November 2013 and included in the conditions of approval issued by the Queensland Government, Department of State Development Infrastructure and Planning and Department of Environment and Heritage Protection. Accordingly, we consider that the proposed action appropriately addresses the importance of the wild Macadamia Nut populations identified within the extension land.</p> <p>This Preliminary Documentation report provides a commitment to incorporation of the buffer lands within the land covered by the offset management plan and associated covenant. The Preliminary Documentation report also provides a commitment to management measures including replanting of native species if appropriate. The offset management plan once prepared will address such as the propagation of certain species if appropriate.</p> <p>In relation to potential impacts to populations of Macadamia Nut from hydrological changes associated with the action, section 2.3.4 of this document confirms that targeted searches failed to record this species within the proposed extraction footprint and section 4.3 outlines why impacts are not anticipated to occur.</p> <p>Accordingly, we consider the comments made in the 1st letter have been appropriately addressed by the existing documentation for the proposed action and do not warrant amendment to the proposed action.</p>

Table 5 – Summary of and Response to 2nd Public Comment Letter

Matter	Summary of public comments	Response
1	<p><i>The survey methodology outlined in the Gondwana report is not adequate for some threatened species which prefer dry exposed ridges in eucalypt forest.</i></p>	<p>For the area surveyed, the effort by Gondwana is considered extensive by State guidelines and survey recommendations for this landscape. Adequate coverage of all vegetation types and potential habitat for threatened species was achieved through 35 quaternary</p>

Matter	Summary of public comments	Response
		<p>survey sites and further targeted walking transects concentrated along gully lines and along dry exposed ridges.</p> <p>The survey effort and assessment by Gondwana was informed by the specific requirements of the State and Commonwealth, and included an analysis of earlier botanical surveys completed in 2004, 2008 and 2013 (i.e. by Gold Coast Botany and BAAM).</p>
2	<p><i>The timing of survey work was not favourable for identification of some threatened species.</i></p>	<p>See response above regarding survey effort and analysis of previous surveys over a number of years.</p>
3	<p><i>Identification of <i>Toechima dasyrrache</i> within the canopy of Vegetation Community 5 and 6 is erroneous and more likely to be <i>Toechima tenax</i> introducing uncertainty regarding the capability and experience of the botanists involved in the flora surveys.</i></p>	<p>There is a potential that the <i>Toechima</i> was misidentified and it is acknowledged that the species on the site may well have been <i>Toechima tenax</i>. The trees were common in the area where the Macadamia population (Vegetation Community 5) occurred. Specimens were not collected due to the height of the trees, steep slope and as a result were identified using binoculars. It is noted that the occurrence of this species is in two communities that are not within the area identified for extraction. These are not species of Commonwealth or State conservation significance.</p>
4	<p><i>Highlights a statement included in the description of the habitat for Ormeau bottle tree, i.e. 'It seems to favour undisturbed rainforest, with few weeds, for reproduction', and questions the accuracy of the habitat description.</i></p>	<p>We note that the sentence highlighted by the 2nd letter is a direct quote from the Approved Conservation Advice (Commonwealth) for the Ormeau bottle tree and therefore is considered, in this context, an adequate description of its habitat.</p> <p>It should also be noted that the information on <i>Brachychiton</i> sp. in Table 4 is summary information that should be viewed in context of the paragraph 3 on page 23 of the Gondwana report. <i>Brachychiton</i> is recognised as having the potential to occur on the margins of the better developed dry rainforest in the west of the site (i.e. areas identified for conservation purposes), and these habitats were heavily disturbed. Nevertheless it is also acknowledged that the species occurs on the margins of rainforest and eucalyptus forest on steep slopes. These habitats were however subject to field surveys.</p>
5	<p><i>Notes that the wild Macadamia Nut population is a sizeable population and warrants greater emphasis.</i></p>	<p>See response to the 1st letter.</p> <p>It is important to note that this population lies within an area identified for conservation.</p> <p>The Gondwana report adequately makes mention of this species on a number of occasions. Including identification within Figures and acknowledges the location of the population outside the areas for extraction. This species has been acknowledged and emphasized adequately.</p>
6	<p><i>Highlights a statement included in the description of habitat for the Ormeau bottle tree, i.e. "There is limited suitable habitat for this species within the subject area with potential habitat in meta sedimentary gorges found not to support any development of notophyll vine forest. Comments that the Ormeau bottle tree is more commonly encountered in eucalypt forest communities on steep rocky slopes of the area as seedlings or young saplings, suggesting that potential for its occurrence adjacent to rainforest communities is high.</i></p>	<p>The comment in the 2nd letter is not consistent with the description of habitat in the Approved Conservation Advice for the Ormeau bottle tree.</p> <p>It is however acknowledged that the species can be found as saplings on steep side slopes and gullies marginal to well-developed patches of rainforest with large trees in the canopy or sub canopy occurring within the better developed rainforest patches in the broader area. As stated in the report, the steep gorges within the site were not found to support development of notophyll rainforest. The best development of rainforest vegetation was in the west of the site (i.e. outside of the target area for extraction) and these areas were subject to survey. The areas surveyed were found to be heavily degraded in parts and considered to provide sub-optimal habitat for this species.</p>

Matter	Summary of public comments	Response
7	<i>Comment that the Shaggy-haired Cockspur Flor (Plectranthus habrophyllus) has been overlooked in another flora survey at Ormeau in recent years and given alleged misidentification of other species there is potential that the botanist did not correctly identify this species.</i>	<p>Multiple studies and surveys conducted by three separate and well qualified consultants have failed to identify this species. It is considered that misidentification is unlikely to have occurred by multiple persons over multiple survey efforts.</p> <p>It is acknowledged that the threatened <i>Plectranthus</i> is superficially similar to the more common <i>Plectranthus parviflorus</i>. The field survey targeted rocky areas and rock outcrops near steep gullies which in many areas were heavily infested with Molasses grass and lantana. The survey utilised the field reference "Mangroves to Mountains" to "assist" differentiation of the <i>P. habrophyllus</i> and <i>P. parviflorus</i> in the field.</p>
8	<i>Identified alleged misidentification of a number of species within Appendix D of the Gondwana report.</i>	<p>It is acknowledged that some errors may have occurred when transferring field notes to species lists.</p> <p>It is confirmed that the following corrections should be acknowledged:</p> <ul style="list-style-type: none"> • The <i>Cordyline stricta</i> record is <i>C. congesta</i>. • The <i>Cryptocarya bidwillii</i> record is <i>C. sp.</i> (Worlds End Pocket). • <i>Toechima dassyrache</i>. As above, it is acknowledged that the species may have been misidentified in the field and may be <i>Toechima tenax</i>. <p>It is also confirmed that:</p> <ul style="list-style-type: none"> • <i>Timonius timon</i> was recorded during the survey. • <i>Citrus australasica</i> was recorded during the survey. <p>Noting the scope of the survey and effort, none of these species are considered of State or Commonwealth concern.</p> <p>It is also recognised that there is no formal requirement to collect specimens for the State Herbarium during field surveys. Vouchers of threatened flora species were collected for verification purposes and these were retained as specimens by the Qld Herbarium.</p>
9	<i>Comment that reference in the Gondwana report that 'there is no suitable habitat for this species in the area of this record' in relation to the Ormeau Bottle Tree recorded as Species code 7389 on the Essential Habitat Map, is misleading and erroneous.</i>	<p>The Gondwana report is consistent with the previous assessment conducted by BAAM Pty Ltd, which states, '<i>targeted searches of potentially suitable habitat did not locate this species. It must be noted that the species was not detected at the location of the essential habitat record (see Essential Habitat Map in Appendix 3 species code 7389). There is no suitable habitat for the species in the area of this record. It is possible that the coordinates of this record are erroneous.</i>'</p> <p>Accordingly, as both the Gondwana report and the assessment by BAAM Pty Ltd provide the same advice on this matter we consider the statement is not misleading or erroneous.</p>
10	<i>No 'Extract 10' provided in the 1st public comment letter.</i>	Not applicable
11	<i>Recovery plans must be developed to ensure genetic diversity</i>	<p>It is recognised that any revegetation or offsetting associated with the proposed extraction may involve weed control and planting of suitable species, including threatened species.</p> <p>Any rehabilitation plans for the subject land would be completed in accordance with the appropriate statutory requirements.</p>
12	<i>Comment that dust control measures are often inadequate and enforcement of dust control needs to be implemented to prevent deleterious effects on threatened species and their habitat.</i>	<p>The allegation that dust control measures at the Hanson Wollfdene Quarry are inadequate is incorrect. Monthly routine dust monitoring is conducted and records for the past 6 months confirm dust deposition concentrations measured below the nominated Performance Target of 3.6g/m²/month at all monitoring locations.</p>

Matter	Summary of public comments	Response
Conclusion	<p><i>Comment that apparent discrepancies in the accuracy of the Gondwana report raise the need for further surveys to accurately determine the location of threatened species and habitat and identify areas that need to be conserved.</i></p>	<p>The 2nd letter refers to the inadequacy of the survey effort with reference to the experience and capability of the botanists performing the surveys.</p> <p>It is acknowledged that three genera were assigned the incorrect species. None of these were threatened species.</p> <p>As with most field survey work, it is accepted that additional species (plants and animals) may be recorded at different times. Hence the requirement for survey techniques to accommodate seasonal variation and condition with a standard and practical approach.</p> <p>As discussed above, the field survey utilised standard best practice survey techniques within the scope of the works and site constraints to document the vegetation and flora of the site with a focus on threatened species and habitat (as per the requirements of the State and Commonwealth).</p> <p>Survey effort was accepted as adequate by the State.</p> <p>The recent survey complimented the previous surveys adding over 120 species to the list.</p> <p>The site and local area has been subject to numerous flora surveys, at different times and by a number of botanists over a number of years.</p>

9. Conclusion

The purpose of this revised Preliminary Documentation report is to incorporate the summary and response to matters raised by public comments during the notification period which occurred in July and August 2015 and provide (in combination with the referral previously submitted) preliminary documentation with regards to the proposed action addressing the matters raised in the DotE request for additional information which was issued in response to the original referral documentation (refer Attachment 9 – The Referral).

The proposed action is the extension of the existing Wolfdene Quarry (the existing quarry) at Luscombe, Queensland onto adjacent land being described as Lot 2 RP15903, Lot 2 RP813599, Lot 67 WD1009 and Lot 80 CP893560 (the extension land).

The existing quarry operates pursuant to a number of historical approvals including a rezoning and consent granted by the former Albert Shire Council in 1981 and an Environmental Authority granted by the Queensland government in 1996 and amended in 2000. Accordingly, the existing quarry holds prior authorisation for the purpose of the EPBC Act.

The proposed action seeks to realise the full potential of a proven high quality hard rock extractive resource, to supply the South East Queensland region (including Council, State road and rail construction projects) with essential quarry materials and thereby support and enhance the economic viability of the region. The inclusion of additional land within the existing quarry footprint will provide access to higher quality resources and improve the efficiency of the quarry operations ensuring that its significant contribution to the region can continue for the next 80 to 100 years. The proposed action has been refined from time to time and further refinements have now occurred to address matters of national environmental significance reducing the proposed extraction footprint and increasing the area of land for environmental offsets (refer Drawing No. 1001.285 – Proposed Action).

Nevertheless, it is considered the residual significant impact of the activity as shown on Drawing No. 1001.280R4 – MNES for Proposed Impact and Offset Areas is the extent of clearing of MNES habitat in the extension land of 112.75ha. In accordance with the relevant guidelines and policies an offset is proposed to address the residual significant impact. The area proposed as an offset for the land to be cleared lies within an area in the south approved for clearing (i.e. Approved Quarry Area) and within land owned by Hanson to the north of the clearing area and comprises 123.87ha. It is also proposed to incorporate the proposed buffer lands of 57.09ha and manage those buffer lands to see an overall biodiversity value improvement to strength the linkages and connectivity to surrounding land. Accordingly, the proposed activity will result in a total of 180.96ha of land owned by Hanson being protected under covenant and managed for the life of the quarry which is anticipated to continue for at least 80 to 100 years.

Based on the above it is considered that the proposed action will result in a conservation outcome that achieves an overall net benefit whilst ensuring a significant extractive resource can continue to be extracted and supply essential construction materials to the region for the next 80 to 100 years.

10. References

McAlpine, C.A., M.E. Bowen, J.G. Callaghan, D. Lunney, J.R. Rhodes, D.L. Mitchell, D.V. Pullar and H.P. Possingham (2006a). *Testing alternative models for the conservation of koalas in fragmented rural-urban landscapes. Austral Ecology*. 31, 529-544

McAlpine C.A., Rhodes J.R., Callaghan J.G., Bowen M.E., Lunney D., Mitchell D.L., Pullar D.V., Possingham H.P., (2006b). *The importance of forested area and configuration relative to local habitat factors for conserving forest mammals: A case study of koalas in Queensland, Australia. Biological Conservation* 132, 153-165

Callaghan J, McAlpine C, Mitchell D, Thompson M, Rhodes J, de Jong C and Domalewski R (2011). *Ranking and mapping koala habitat quality for conservation planning on the basis of indirect evidence of tree-species use: a case study of Noosa Shire, south-eastern Queensland. Wildlife Research*, 2011, 38, 89–102

fi gures

attachments

Attachment 1

Gondwana Ecology Group Figure 5 – Vegetation Communities

Attachment 2

Gondwana Ecology Group Figure 6 – Threatened Flora Locations and Potential Habitat

Attachment 3

Gondwana Ecology Group Figure 8 – Threatened Fauna Locations and Potential Habitat

Attachment 4

Gold Coast City Council Yatala Enterprise Area Local Area Plan LAP map 29.2 Precincts

Attachment 5

Environmental Authority under the Environmental Protection Act 1994

Attachment 6

Letter from Department of State Development, Infrastructure and Planning

Attachment 7

Letter from Gold Coast City Council

Attachment 8

Environmental Authority SR197

Attachment 9

The Referral