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25 March 2011

Committee Secretary
Environment and Communications References Committee
PO Box 6100
Parliament House
Canberra ACT 2600

Dear Committee Secretary,

Thank you for the opportunity to respond to the written submissions that the Senate Committee has received that refer to Barro Group or Mount Cotton Quarry.

Barro Group is very concerned by a number of false and misleading comments and allegations that are made by the authors of the documents referred to as "Excerpts from submission A:" and "Excerpts from submission B:".

The most damaging comments also appear to be of no relevance to the Senate Inquiry.

Barro Group welcomes robust debate about environmental issues (such as the protection of koalas and koala habitat) and its current proposal to extend its quarry operations. However, it strongly objects to these comments which, if made outside the Inquiry, would amount to serious defamation.

It can only be presumed that such comments have been made to improperly use the Senate Inquiry as a vehicle to attempt to disrepute Barro Group generally and harm the prospects of Barro Group obtaining relevant development approvals for its proposal to extend its quarry, which has been the subject of long running opposition from local residents and interest groups.

We urge the Committee to not let the Inquiry be used in this way.

We provide relevant background and comments on each submission separately below.

Relevant background

Barro Group is a family owned company with over 60 years experience supplying quality materials to the

construction industry. The business started in 1946 and has grown to become an integrated resources, manufacturing and distribution organisation.

Barro Group owns a 241 ha property in Mount Cotton. Since the early 1960's until today a quarry has been operating on the north east section of the property. There is also an abandoned quarry on the south east section of the property. Prior uses of the property include timber getting and logging, banana plantation, dairy farming and beef cattle fattening. As a result of these farming activities the property, particularly the western side, were cleared. See the attached drawing 987.083 which designates the property boundaries in bold red overlaid by part of an aerial photo that was taken in 1970. The pink lines show the location of a proposed quarry extension area that is the subject of a current development application which has been lodged with the Redland City Council.

Extensive survey work has been carried on the property by expert consulting companies to identify all flora and fauna values.

As a result of that work it was estimated that the property supported a population of 29 koalas. Redland City Council advises on its web site that it is estimated that there are 4611 koalas in the Koala Coast area and 2939 koalas in the Redlands (the date of data is thought to be 2008). Based on this information the percentage of koalas on the property are 0.63% of the Koala Coast area and 0.99% of the Redlands area.

Notwithstanding this, Barro Group view 29 koalas as being significant and if our current development application is approved, 170 ha of the property will be set aside for conservation purposes including revegetation of 40 hectares of currently cleared area and rehabilitation of other parts of the property. It is expected that in excess of 50,000 koala food trees will be planted on the property and that eventually the habitat will have the capacity to support up to around 50 koalas.

Not only will the increased vegetation support more koalas, connectivity on the site and through the site to other habitats for both koalas and other fauna will be substantially improved.

There has been a significant amount of research done by experts, all of which has been made publically available through the development application process, to support these assertions. We would be happy to furnish the relevant expert reports if requested.

Barro Group would like the Senate Inquiry to be clear that it is Barro Group's intention to substantially improve the koala habitat, and in turn increase koala numbers and connectivity, on its freehold land in conjunction with carrying out extractive activities at the property which has been identified as a Key Resource for Queensland.

Excerpt from submission A:

Quarry materials are essential to our way of life as they are the raw materials for building our homes, hospitals, schools and factories, as well as supporting infrastructure such as roads, railways, water supply and sewerage systems.

The Queensland Government realised the importance of ensuring that economic reserves of extractive resources were available to support the growth of Queensland and as early as the year 2000 the Government began an exercise of identifying extractive resources across Queensland that in its opinion should be protected.

The Government's research, consultation and communication was a lengthy process which cumulated in approximately one hundred extractive sites being identified in Queensland that fitted the Government's criteria as being listed as a Key Resource Area and included in State Planning Policy 2/07-Protection of Extractive Resources (**SPP 2/07**)

The Mount Cotton Quarry was included as one of the one hundred sites identified.

Barro Group strenuously denies that it had any improper dealings with the State Government or its Ministers in the formulation of the SPP 2/07.

"Mr Rihon Cox" (Rohan Cox) has never been an employee of Barro Group. Mr Cox at that time was an employee of Rocla and was seconded by Rocla as the Manager of Mt Marrow Blue Metal Quarries located west of Ipswich in which Barro Group has 50% ownership.

The allegation that "Mr Rihon Cox" was an employee of Barro Group is clearly false and vexatious and should not be published.

We have attached both the SPP 2/07 and the Guideline to the policy for your information.

We point out that there are two areas on Barro Group property that are identified as extraction and processing areas. One area has been in the ownership of Barro Group since 1992 and the other area has been in the ownership of Barro Group since 2003. The first draft of SPP 2/07 was not released for comment until late 2004 with submissions closing on the 13th December 2004 (there may have been a further extension to this time). The SPP 2/07 was not adopted until 8th June 2007 so it is nonsense to suggest that "Six days after the government oked KRA 71, the Barro Group bought the property" because at the time Barro Group purchased the property the Draft SPP had not even been issued let alone adopted, as this did not happen until 2007.

The allegations made are clearly false and vexatious and should not be published.

The statement regarding the "E.P.A officer stated at the time....." is vague and includes no names and it is not clear what the "time" was or where the statement was made.

The statement adds no facts or evidence that is relevant to the Senate Inquiry in to the status, health and sustainability of Australia's koala population and should not be published.

Excerpt from submission B:

South Developments and its directors have a long history of property development in the Redlands. There is nothing unusual about them purchasing rural land with the intent of redeveloping the land for housing purposes.

In the case of the property in question, South Development's intention was to build a rural residential subdivision and approached Barro Group (as I understand with some encouragement from the then Redland Shire Council) to determine how its proposed development and Barro Group's operating quarry on the adjoining land would coexist.

The planned stage 6 of Barro Group's existing quarry was to progress along the ridgeline in a north westerly direction towards the property that was now in the ownership of South Developments. There was no doubt

that good reserves of rock existed past stage 6 and into South Developments property and understandably Barro Group had a considerable interest in the property.

Following that interaction, Barro Group made representations to South Developments to purchase the property and a commercial negotiation took place, no doubt with South Developments wanting to build into the purchase price some of the foregone value that it may have achieved if its plans to subdivide had occurred and no doubt Barro Group attributed value to the property as a means of ensuring the continuation of its extractive industry business.

The suggestion that "senior executives and others in the DNR" had some part in this transaction is false and vexatious and should not be published.

The author of the excerpt from submission B claims that "environmental groups and affected community such as neighbouring properties were unaware and not involved in any community consultation" during the drafting of SPP 2/07 however that statement is false. Contact should be made with the relevant Government Department to verify the consultation which no doubt did happen including a meeting run by the Department of Natural Resources at the Mount Cotton Community Hall shortly after the draft of the SPP 2/07 (**Draft SPP**) was released.

As further evidence, albeit that this occurred before the release of the Draft SPP (a copy of the Draft SPP is attached), we provide an extract from the Draft SPP publication:

"In 2001, the intention to prepare the proposed State Planning Policy: Protection of Extractive Resources (SPP) was announced by the Minister for Natural Resources and Mines and the then Minister for Local Government and Planning and public submissions were called for.

Forty-five responses were received through the submission process from State Government agencies, local governments, professional bodies, interest groups, and members of the community. In addition to the formal process, key stakeholders were consulted, including the Local Government Association of Queensland, Urban Development Institute of Australia and the Planning Institute of Australia."

Between the release of the Draft SPP and the adoption of SPP 2/07 there was a period of almost 3 years for interested parties to make further submissions and representations.

The statements made by the author of the excerpt from submission B are once again misleading and should not be published and the credibility of all statements made by the author must be questioned.

Below is an extract from a paper given by a Town Planning expert at a Queensland Environmental Law Seminar 10th September 2007 which details some of the key dates relating to SPP 2/07 and reasons why the time from drafting to adoption was so drawn out.

STATE PLANNING POLICY 2/07 – PROTECTION OF EXTRACTIVE RESOURCES
A SHORT TOWN PLANNING COMMENTARY

Matthew Schneider
Humphreys Reynolds Perkins Planning Consultants

Thank you, Steve, and good evening ladies and gentlemen.

The recent taking effect of *State Planning Policy 2/07 – Protection of Extractive Resources* was, by no stretch of the imagination, premature. The State Planning Policy, in its draft form, had been released for public consultation on 16 October 2004 – almost three years prior to its eventual commencement last Monday, on the third of September 2007.

The lengthy period between the notification of the draft SPP and its eventual commencement resulted in my experience of the SPP, thus far, being one of uncertainty and some complexity. And that makes perfect sense, when one takes a moment to reflect on some of the town planning events, relevant to the application of the draft SPP, that also occurred during those three intervening years:-

1. On 16 October 2004, the draft *State Planning Policy for Protection of Extractive Resources* was released for public consultation;

2. On 27 October 2004, the draft *South East Queensland Regional Plan* was released for public consultation;

3. Between 31 January 2005 and 2 October 2006, a series of five separate plans relating to koalas and development had some effect, ending with the commencement of the current *Nature Conservation (Koala) Conservation Plan 2006* on 02 October 2006;

4. On 20 November 2006, the new Regional Vegetation Management Codes and Policies, including Essential Habitat mapping and provisions applicable to development in a Key Resource Area under an adopted State Planning Policy for Protection of Extractive Resources, came into effect under the Vegetation Management Act 1999; and

5. Dozens of local government authorities continued to prepare, advertise and adopt new Integrated Planning Act compliant planning schemes.

In the third paragraph "..."Wipe the slate clean" the author of the excerpt from submission B refers to a "public roadway reserve". The specific section of the unmade road reserve ("public roadway reserve") referred to is approximately 400m long and 20m wide giving a total area of approximately 8000m2 (0.8ha). Vegetation has been legally removed from both sides of this section of the unmade road reserve and vegetation was removed at the south end section of the unmade road and on part of the unmade road by parties other than Barro Group. If the vegetation still existed it would have very low to nil habitat value and no connectivity value.

In 1992 an existing quarrying business being undertaken on Lot 17 on RP 108970 was put up for sale by a tender process which was won by Barro Group.

During the period 1992 to 1994 years future working plans for the quarry were prepared by Barro Group and agreed to by the then Redland Shire Council. The plans detailed 6 progressive stages of the quarry which showed progressive quarrying of the unmade road reserve.

From 1994 to 2004 quarry development occurred in accordance with the approved staging and development plans. Between 1992 and 2004 there were countless inspections of the site by both State Government Departments and Redland Shire and until 2004 not one mention was raised about the unmade road reserve. It can only be concluded that all parties we unaware of the nuances that related to ownership and tenure of the unmade road reserve.

In December 2003 Redland Shire approved the clearing for stage 5 of the quarry development and that area was cleared which included an area of about 2400m2 of the unmade road reserve, however some of this 2400m2 had already been previously cleared to provide a rough access track along the unmade road reserve.

Responding to a complaint about the clearing for stage 5 the then Department of Natural Resources, Mines and Energy visited the site at which time it was identified that whilst control of the unmade road reserve rested with the Redland Shire ownership of the unmade road reserve rested with the State government and subsequently a Warning Notice was issued regarding the clearing of part of the vegetation on the 2400m2 section of the unmade road.

Barro Group has not cleared any further vegetation on the unmade road reserve since the Warning Notice was issued in 2004.

Objective evidence to support this fact can be found by searching Google Earth aerial images which are dated 24th March 2003 (pre clearing), 31st March 2004 (post clearing) and June 4th 2010 (most recent image).

The allegation that "the quarry continued to wilfully cause serious environmental harm by destroying the environmental values associated with vegetation clearing" is clearly false and vexatious and should not be published.

Barro Group cannot comment about the events at a meeting on the 2nd December 2010 as it was not invited to participate in that meeting however the only connection in this paragraph to the status, health and sustainability of koalas, and it a very obscure connection, is the comment about "systemic clearing" which is not true and as noted previously no vegetation clearing has occurred since 2004.

Other matters raised by the author of the excerpt from submission B do not appear to have any relevance to the Senate Inquiry in to the status, health and

sustainability of Australia's koala population and accordingly Barro Group requests that only matters that are directly related to the subject of the inquiry are published.

Barro Group would be pleased to provide any further information to assist the Senate Committee and hope that the Committee now understands that that the Development proposed by Barro Group at Mount Cotton will substantially enhance the health, sustainability and population of koalas in the Redlands area.

Yours faithfully
BARRO GROUP PTY LIMITED

Ian K Ridoutt
General Manager QLD

State Planning Policy 2/07

Protection of Extractive Resources

Queensland the Smart State

Queensland Government

State Planning Policy 2/07

Protection of Extractive Resources

Integrated Planning Act 1997

STATE PLANNING POLICY 2/07
Protection of Extractive Resources

The Minister for Local Government, Planning and Sport adopted State Planning Policy 2/07 on 8 June 2007.

Making of the State Planning Policy
State Planning Policy 2/07 was made under Schedule 4 of the *Integrated Planning Act 1997*.

Commencement
State Planning Policy 2/07 took effect on 3 September 2007.

ISBN 978-1-7417-2569-8

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EXPLANATORY STATEMENT

Need to protect extractive resources

Extractive resources include sand, gravel, quarry rock, clay and soil and are used in concrete, asphalt, road bases and a range of other products. They are essential to our way of life as they are the raw materials for building our homes, hospitals, schools and factories, as well as the supporting infrastructure, such as roads, railways, water supply and sewerage systems.

The main markets for extractive resource products are the urban communities around Queensland experiencing high and sustained population growth. The location of extractive resources is determined by geological conditions and is finite. They need to be accessed where they naturally occur and also be close to their markets. Unfortunately this can result in conflict between extractive industry and other, incompatible land uses, such as residential uses, that have the potential to sterilise the availability of the extractive resource.

Outcome sought by SPP 2/07

SPP 2/07 identifies those extractive resources of State or regional significance where extractive industry development is appropriate in principle, and aims to protect those resources from developments that might prevent or severely constrain current or future extraction when the need for the resource arises.

The Policy identifies the location of such extractive resources as Key Resource Areas (KRAs), each of which contain three elements – a resource/processing area, a separation area and an associated transport route (which also includes a transport route separation area) where such a link is needed from the resource/processing area to a major road or railway. The resource/processing area generally identifies the location of the extractive resource itself. The adjoining separation area identifies the area that may be affected by the residual impacts of existing or future extractive operations in the resource/processing area, and also provides a buffer between those operations and any incompatible uses beyond and adjoining the separation area.

SPP 2/07 seeks to ensure that as far as practicable, development within a resource/processing area, the separation area of a KRA and the associated transport route's separation area are compatible with existing or future extractive industry. However SPP 2/07 recognises that there are acceptable circumstances where this outcome might not be achieved, namely where there are existing development commitments or an overriding public interest for another use of the land. SPP 2/07 also recognises that extractive industry development in certain KRAs will need to comply with the requirements of the vegetation management codes under the *Vegetation Management Act 1999*, particularly where there are State or regional biodiversity values; any adverse impacts on those values should be avoided or mitigated.

As some resources have not yet been fully explored in detail, the resource/processing area boundary may not accurately reflect the workable extractive resource. It is therefore possible that extractive industry developments may occur in the existing separation area. However, extractive industry development should only occur in the separation area where the function of the separation area as a buffer is not compromised.

Implementing SPP 2/07

SPP 2/07 will influence land use planning and development decisions within KRAs. In particular, it will help shape planning schemes of local governments with KRAs in their areas.

While SPP 2/07 endorses the **principle** of extractive industry development in a resource/processing area of a KRA and identifies appropriate transport routes, development applications for new extractive industry operations in a KRA will be subject to the normal assessment process under the 'Integrated Development Assessment System' (IDAS).

Therefore, the assessment would include not only SPP 2/07, but also detailed consideration of the relevant environmental, amenity and traffic policies and the requirements in the applicable local government planning scheme and other relevant considerations under IDAS (e.g. the State Policy and regional codes for vegetation management under the *Vegetation Management Act 1999* and requirements imposed on 'environmentally relevant activities' under the *Environmental Protection Act 1994*). People will continue to have the opportunity to make submissions on development applications that are subject to impact assessment, and those submissions must be considered in the assessment.

Accordingly, SPP 2/07 does **not** guarantee that a particular development application for an extractive industry in a KRA will be approved. However, of the 100 KRAs listed by the Policy, 90 already have current extractive industry development approvals, and the SPP can be used to protect these KRAs from incompatible development where such development is not already committed.

Reflecting the SEQ Regional Plan

This State Planning Policy is consistent with the SEQ Regional Plan, which aims to protect extractive resources for potential future extraction and their associated transport corridors. The SEQ Regional Plan relies on the SPP to provide the detailed basis for achieving this aim.

PART 1— POLICY OUTCOME

1 Outcome sought by the Policy

(1) The Policy outcome is to identify those extractive resources of State or regional significance where extractive industry development is appropriate in principle, and protect those resources from developments that might prevent or severely constrain current or future extraction when the need for the resource arises.

PART 2—APPLICATION OF THE POLICY

2 State Planning Policy and State Planning Policy Guideline

(1) The State Planning Policy: *Protection of Extractive Resources* (the Policy) is a statutory instrument under the *Integrated Planning Act 1997*.

(2) The State Planning Policy Guideline: *Protection of Extractive Resources* (the Policy Guideline) provides advice about implementing the Policy, and is declared to be extrinsic material under the *Statutory Instruments Act 1992*, section 15.

(3) Under the *Integrated Planning Act 1997*, the Policy has effect when development applications are assessed, when planning schemes are made or amended and when land is designated for community infrastructure.

(4) Terms used in the Policy and Policy Guideline have the same meaning as defined in the *Integrated Planning Act 1997*.

(5) The Glossary in Section 10 explains particular words used in the Policy.

3 Areas to which the Policy applies

(1) The Policy identifies extractive resources of State or regional significance as Key Resource Areas, comprising a resource/processing area, an adjoining separation area and an associated transport route (including a transport route's separation area) to a major road or railway. Annex 1 describes the Key Resource Area concept in more detail.

(2) The Policy applies to premises within a Key Resource Area.

(3) The Key Resource Areas are listed by local government area in Annex 2 and are shown on maps in Annex 3.

4 Development to which the Policy applies

(1) The Policy applies to development that is—
- (a) in **any part of a Key Resource Area** – reconfiguring a lot; and
- (b) in **a resource/processing area** – a material change of use; and
- (c) in **a separation area** for a resource/processing area – a material change of use, **except** for—
  - (i) a caretaker's residence for extractive industry;
  - (ii) agriculture not involving intensive animal husbandry;
  - (iii) forestry;
  - (iv) nature conservation;
  - (v) land fill or refuse transfer station; and
  - (vi) passive recreational uses such as open space;
- (d) in **a transport route's separation area** – a material change of use that increases the number of people living in the separation area.
- (e) operational works associated with the making or upgrading of vehicular access to the **transport route**.

(2) However, the Policy does not apply to a domestic activity[1].

5 Matters outside the scope of the Policy

(1) Except for the matters addressed in 7 (2) below, this Policy does not address the detailed aspects of development approval for extractive industries or the details associated with extractive industry operations, e.g. extracting, processing and transporting extracted resources, as such matters are regulated under the *Environmental Protection Act 1994*, the *Vegetation Management Act 1999*, and through development assessment under the *Integrated Planning Act 1997*.

PART 3—MAKING OR AMENDING A PLANNING SCHEME

6 Achieving the Policy outcome through the planning scheme

(1) The Policy outcome is achieved when making or amending a planning scheme by—
- (a) identifying in the planning scheme each Key Resource Area located within the local government area; and
- (b) allocating uses in Key Resource Areas, that are compatible with the existing or future extraction, processing and transportation of extractive resources, consistent with Part 4; and
- (c) making development to which the Policy applies assessable or self-assessable having regard to the compatibility of development consistent with Part 4; and
- (d) incorporating assessment criteria in one or more applicable codes for assessable development consistent with Part 4; and
- (e) stating in the planning scheme or a planning scheme policy the appropriate information that may be requested for assessing development to which the Policy applies.

[1] See Section 10, Glossary for the definition of 'domestic activity'.

(2) For further advice on how to achieve the Policy outcome through the planning scheme, refer to Part 4 and Appendix 2 in the Policy Guideline.

PART 4—DEVELOPMENT ASSESSMENT

7 Achieving the Policy outcome through development assessment

(1) The Policy outcome is achieved when development to which the Policy applies is compatible with the existing and future extraction, processing and transportation of extractive resources from a Key Resource Area. This will be achieved if development—

(a) in **a resource/processing area** – is associated with either the extraction or processing of the extractive resource; and

(b) in **the separation area for a resource/processing area**—

(i) does not increase the number of people living in the separation area; and

(ii) to the greatest extent practicable minimises the potential adverse effects from existing or future extractive industries on people working or congregating in the separation area; and

(iii) does not compromise the function of the separation area in providing a buffer between extractive/processing operations and any incompatible uses outside the separation area; and

(c) in **a transport route's separation area** – does not increase the number of people living in the separation area; and

(d) **with direct vehicular access to the transport route** – does not adversely affect the safety and efficiency of vehicles using the transport route to transport extractive resources from an existing or future extractive industry.

(2) However, despite 7 (1), development for extractive industry purposes will also need to comply with the State Policy and regional codes for vegetation management[2] under the *Vegetation Management Act 1999* to protect native vegetation of environmental significance, including in certain specified Key Resource Areas[3]areas having State or regional biodiversity significance[4].

(3) For further advice on how to achieve the Policy outcome through development assessment, refer to Part 5 and Appendix 2 of the Policy Guideline.

8 Acceptable circumstances for not achieving the Policy outcome

(1) Acceptable circumstances for development not achieving the Policy outcome are—

(a) the development is a development commitment; or

(b) a material change of use—

(i) provides an overriding benefit to the State or regional community in social, economic or ecological terms that outweighs the community benefit of maintaining the long-term availability of the extractive resource; and

(ii) cannot reasonably be located elsewhere.

[2] The *State Policy for Vegetation Management* and the applicable *Regional Codes for Ongoing Clearing Purposes*.

[3] See Annex 4 for a list of the Key Resource Areas affected by this section.

[4] State biodiversity values are set out in the Policy Guideline under Appendix 3: Key Resource Area Information regarding each of the resource/processing areas.

(2) However, despite subsection (1), the adverse effects of the development on the long term availability of the extractive resource must be reduced to the greatest extent practicable.

PART 5—INFORMATION AND ADVICE ON THE POLICY

9 Sources of information and advice

(1) The Queensland Department of Mines and Energy can provide advice on implementing and interpreting the Policy and on reflecting the Policy in a planning scheme.

(2) The Queensland Department of Local Government, Planning, Sport and Recreation can provide advice on reflecting the Policy in a planning scheme and the operation of the Integrated Development Assessment System.

10 Glossary

(1) The following terms used in the Policy are explained below:

Air blast overpressure
Air blast overpressure results when an explosion in rock produces a pressure wave that travels through the atmosphere.

Development commitment
Development commitment means any of the following—

a) development the subject of a **current development approval**; or
b) **a material change of use** clearly consistent with the purposes of codes (or equivalent policy intents) of the relevant zone (or equivalent) in the planning scheme and, if applicable, the regulatory provisions of the SEQ Regional Plan; or
c) **reconfiguring a lot** consistent with the purposes of codes (or equivalent policy intents) of the relevant zone (or equivalent) in the planning scheme and, if applicable, the regulatory provisions of the SEQ Regional Plan.

Domestic activity
Domestic activity means the use of premises for a residential purpose and associated activities comprising any one or more of the following—

(a) a single residential dwelling on an existing lot;
(b) home based business employing no more than two non-resident people; or
(c) relatives accommodation (e.g. granny flat).

Extractive industry
Extractive industry is the extraction and processing of extractive resources and associated activities, including their transportation to markets.

Extractive resources
Extractive resources are natural deposits of sand, gravel, quarry rock, clay, and soil extracted from the earth's crust and processed for use in construction. The products processed from extractive resources are sometimes termed extractive materials or construction aggregates. Extractive resources do not include minerals under the *Mineral Resources Act 1989* such as metal ores, coal, clay for ceramic purposes, foundry sand, limestone and silica sand mined and used for their chemical properties, and rock mined in block or slab form for building or monumental purposes.

Resource/processing area
The resource/processing area of a Key Resource Area indicates the extent of the extractive resource and any existing or future processing operations.

Ground vibration
Ground vibration is caused when an explosion in rock produces a pressure wave that travels through the ground.

Major road
A major road is a road the function of which is consistent with the proposed extractive resource traffic requirements and is generally a State controlled road.

Separation area for a resource/processing area
This separation area is the area surrounding the resource/processing area needed to maintain separation of people from undesirable levels of noise, dust, ground vibration, or air blast overpressure that may be produced as residual impacts from existing or future extraction or processing of the extractive resource.

State or regionally significant biodiversity areas
Areas determined as having State or regional biodiversity significance through a Biodiversity Planning Assessment or surrogate process undertaken by the Environmental Protection Agency. Biodiversity Planning Assessments show an area according to specified biodiversity values.

Transport route
The transport route indicates the route used to transport extracted resources to markets. The transport route is a road or rail link from the boundary of the resource/processing area to a major road or railway.

Transport route's separation area
The transport route's separation area is the area surrounding the transport route needed to maintain separation of people from undesirable levels of noise, dust and ground vibration produced as residual impacts from the transportation of extractive resources.

ANNEX 1

Key Resource Area Concept

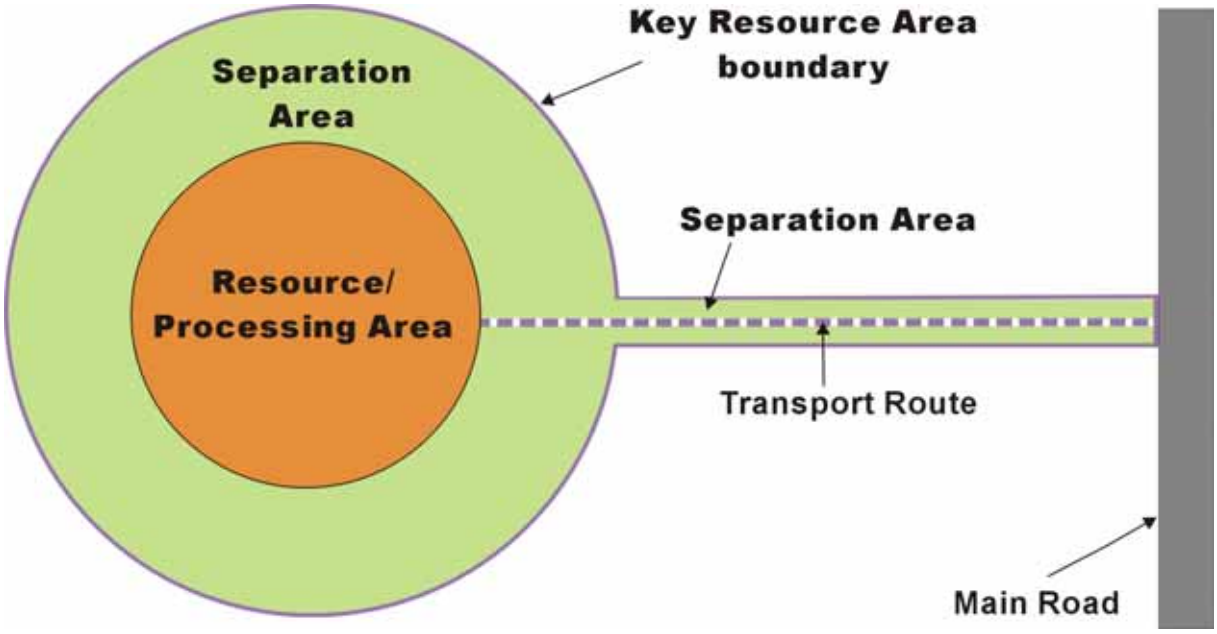
A1.1 The following diagram illustrates the Key Resource Area concept. A Key Resource Area includes the following elements:

(a) the *resource/processing area*; and

(b) the *separation area* around the extractive resource/processing area; and

(c) the associated *transport route* with a separation area of 100 metres either side of the road or rail reserve boundary or, if no reserve the centre line of the indicated route.

A1.2 NOTE – the Key Resource Area maps in Annex 3 are unable to show the transport route's separation area due to map scale.



*In a few instances, the transport route goes to a rail line rather than a major road.

ANNEX 2

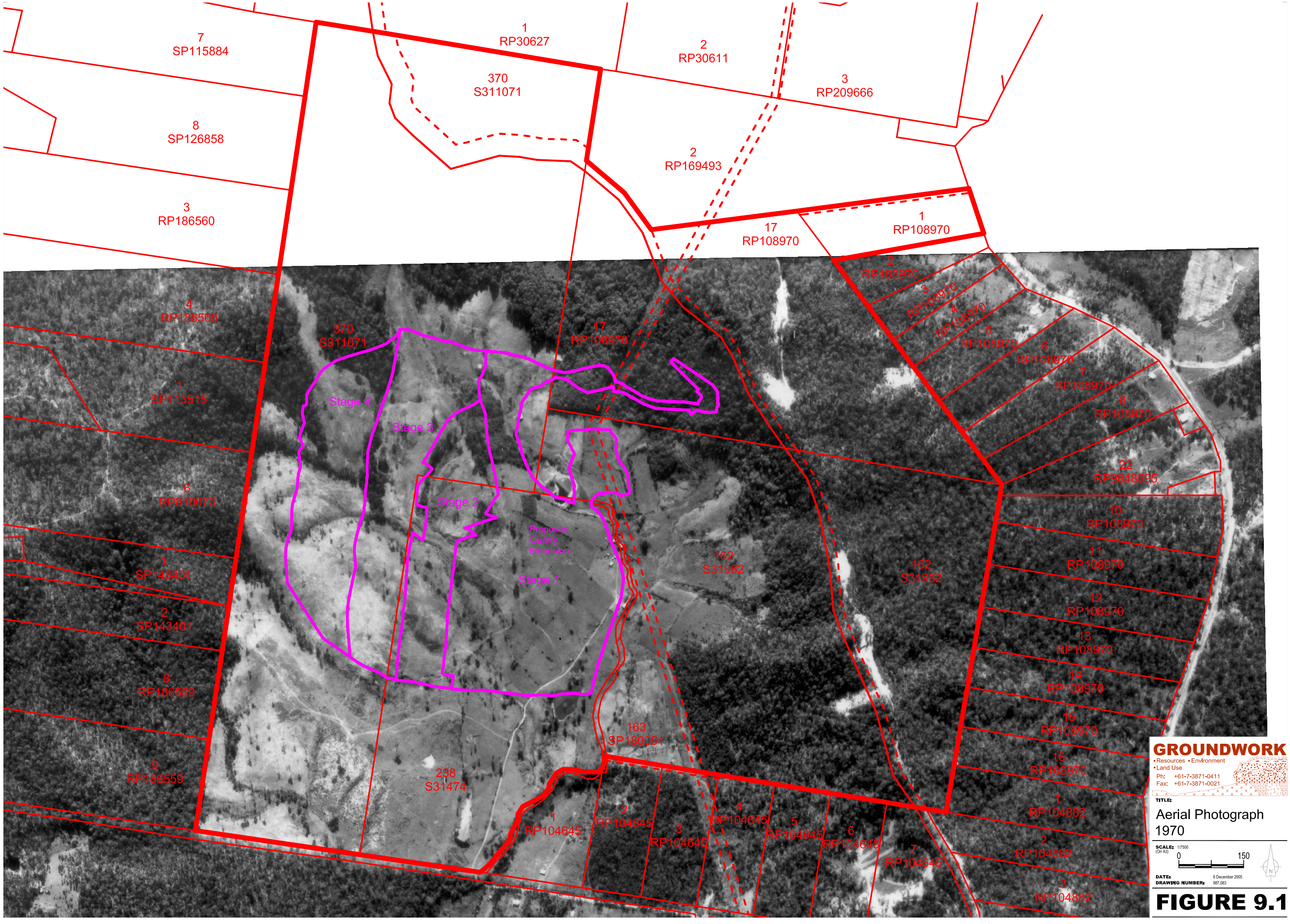
Key Resource Areas

A2.1 The Policy applies to the following Key Resource Areas:

Local Government Area	Key Resource Area	KRA No.
Atherton Shire	Wongabel	9
Beaudesert Shire	Bromelton	61
Beaudesert Shire	Clutha Creek Sands	94
Beaudesert Shire	Mundoolun Connection Sands	95
Booringa Shire	Marbango	84
Bowen Shire	West Euri Creek	37
Brisbane City	Ferny Grove	39
Brisbane City	Kholo Creek	41
Brisbane City and Ipswich City	Kholo Sands	80
Brisbane City	Mount Coot-tha	42
Brisbane City and Pine Rivers Shire	Pine Rivers North	59
Brisbane City and Pine Rivers Shire	Pine Rivers South	60
Bungil Shire	Warrian	85
Burdekin Shire	The Rocks	28
Burnett Shire	Bargara	86
Burnett Shire	Innes Park	87
Burnett Shire	Tantitha	97
Caboolture Shire	Beachmere	43
Caboolture Shire	Bracalba	44
Caboolture Shire	Meldale / Donnybrook	45
Caboolture Shire and Pine Rivers Shire	Narangba	46
Caboolture Shire	Ningi	47
Cairns City	Barron River Flats	10
Cairns City	Behana Gorge Road	38
Cairns City	Maitland Road	40
Cairns City	Mountainview	11
Cairns City	Redlynch	12
Cairns City	Wright Creek	13
Calliope Shire	Taragoola	19
Calliope Shire	Yarwun	20
Caloundra City	Glasshouse	48
Caloundra City	Glenview	50
Caloundra City	Meridan Plains	49
Caloundra City	Sunrock	51
Cooloola Shire	Meadvale	88
Cooloola Shire and Maroochy Shire	Moy Pocket	89
Crows Nest Shire	Ravensbourne	1
Esk Shire	Dingyarra	73
Esk Shire	Glen Arden	74

Local Government Area	Key Resource Area	KRA No.
Esk Shire	Harris Terrace	75
Esk Shire and Ipswich City	Hills Terrace	77
Esk Shire	Schmidt's Terrace	76
Esk Shire and Ipswich City	Summerville and Sapling Pocket	83
Esk Shire	Wiralee	78
Fitzroy Shire	Benedict Road	18
Fitzroy Shire and Livingstone Shire	Pink Lily	22
Gatton Shire and Toowoomba City	Harlaxton	8
Gatton Shire	Mount Cross	79
Gold Coast City	Blue Rock	62
Gold Coast City and Logan City	Carbrook / Eagleby	63
Gold Coast City	Charlies Crossing	64
Gold Coast City	Jacobs Well	65
Gold Coast City	Nerang	66
Gold Coast City	Northern Darlington Range	67
Gold Coast City	Oxenford	68
Gold Coast City	Reedy Creek	96
Gold Coast City	Stapylton	69
Gold Coast City	West Burleigh	70
Herberton Shire	Ravenshoe	14
Hervey Bay City	Dundowran	90
Hervey Bay City	Dundowran West	91
Hinchinbrook Shire	Mount Cordelia	29
Inglewood Shire	Inglewood	2
Ipswich City and Esk Shire	Hills Terrace	77
Ipswich City and Brisbane City	Kholo Sands	80
Ipswich City	Mount Marrow	81
Ipswich City	Purga	82
Ipswich City and Esk Shire	Summerville and Sapling Pocket	83
Isis Shire	Redridge	92
Johnstone Shire	Coorumba Road	15
Johnstone Shire	Pin Gin Hill	16
Jondaryan Shire and Toowoomba City	Glenvale	4
Jondaryan Shire	Wellcamp Downs	3
Livingstone Shire	Nerimbera	21
Livingstone Shire and Fitzroy Shire	Pink Lily	22
Logan City and Gold Coast City	Carbrook / Eagleby	63
Logan City and Redland Shire	Mount Cotton	71
Logan City and Redland Shire	West Mount Cotton	72
Mackay City	Farleigh	24
Mackay City	The Cedars	23
Mareeba Shire	Tichum Creek	17
Maroochy Shire	Bli Bli	52
Maroochy Shire	Image Flat	53
Maroochy Shire and Cooloola Shire	Moy Pocket	89
Maroochy Shire	Toolborough Road	55
Maroochy Shire	Yandina Creek	54

Local Government Area	Key Resource Area	KRA No.
Nanango Shire	Hodgleigh	93
Nebo Shire	Waitara	33
Noosa Shire	Ringtail Creek	56
Noosa Shire	Wahpunga Range	57
Pine Rivers Shire and Caboolture Shire	Narangba	46
Pine Rivers Shire	Whiteside	58
Pine Rivers Shire and Brisbane City	Pine Rivers North	59
Pine Rivers Shire and Brisbane City	Pine Rivers South	60
Redland Shire and Logan City	Mount Cotton	71
Redland Shire and Logan City	West Mount Cotton	72
Rockhampton City	Peak Hill	98
Rosalie Shire	Malu	5
Sarina Shire	Hatfield	25
Thuringowa City	Black River	30
Thuringowa City	Bohle	31
Thuringowa City	Pinnacles	32
Toowoomba City and Jondaryan Shire	Glenvale	4
Toowoomba City and Gatton Shire	Harlaxton	8
Townsville City	Cape Cleveland	34
Townsville City	Roseneath East	35
Townsville City	Roseneath West	36
Wambo Shire	Jimbour	6
Warwick Shire	Braeside	7
Whitsunday Shire	Foxdale	26
Whitsunday Shire	North Gregory	27
Winton Shire	Bladensburg	99
Winton Shire	Windemere	100



GROUNDWORK
• Resources • Environment
• Land Use
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TITLE:

Aerial Photograph
1970

SCALE: 1:7500
(On A3)
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DATE: 8 December 2005
DRAWING NUMBER: 987.083

FIGURE 9.1

Integrated Planning Act 1997

EXPLANATORY STATEMENT

Draft State Planning Policy: Protection of Extractive Resources

In 2001, the intention to prepare the proposed State Planning Policy: Protection of Extractive Resources (SPP) was announced by the Minister for Natural Resources and Mines and the then Minister for Local Government and Planning and public submissions were called for.

Forty-five responses were received through the submissions process from State Government agencies, local governments, professional bodies, interest groups and members of the community. In addition to the formal process, key stakeholders were consulted, including the Local Government Association of Queensland, the Urban Development Institute of Australia and the Planning Institute of Australia.

Preparation of proposed State Planning Policy

A draft of the proposed SPP has now been prepared and takes into account stakeholder comments, as well as the provisions of the *Integrated Planning Act 1997* (IPA) and covers:

- where and to what development the policy applies; and
- the outcomes sought when making planning schemes and assessing development applications.

The technical information and advice on implementing the SPP is contained in the proposed SPP Guideline (which has status as an official supporting document).

Issues addressed by the proposed State Planning Policy

The purpose of the SPP is to set out the State's interests concerning development on or in the vicinity of extractive resources of State significance, their processing areas and external haul routes referred to as Key Resource Areas (KRAs), and to protect these KRAs from incompatible development when land use planning decisions are made. The proposed SPP also applies to the land set aside for community infrastructure anywhere in a KRA.

The draft of the proposed SPP has been prepared jointly by the Honourable Stephen Robertson MP, Minister for Natural Resources and Mines and the Honourable Desley Boyle MP, Minister for Environment, Local Government, Planning and Women.

Outcomes sought by the proposed State Planning Policy

The proposed SPP will influence land use planning and development decisions to protect extractive resources and also reduce the adverse effects of their extraction on the community. It will also seek to ensure that development in a KRA is compatible with the extraction, processing and transport of extractive materials to markets. The requirement to achieve these outcomes must be adequately considered when development applications are assessed, when planning schemes are made or amended and when land is designated for community infrastructure.

Public submissions on the proposed State Planning Policy are now invited

To receive a copy of the draft SPP and its associated guidelines contact the Department of Natural Resources and Mines (NR&M) on 07 3224 2537or visit the website www.nrm.qld.gov.au.

Submissions can be sent to NR&M at:
Mail: SPP Extractive Resources
Director-General
Department of Natural Resources and Mines
GPO Box 2454
BRISBANE QLD 4001

Email: SPPextractive@nrm.qld.gov.au

The closing date for submissions is Monday 13 December 2004.

Submissions must be made in writing, signed by each person making the submission, and include each submitter's name and address. The grounds for the submission must be stated as well as the facts and circumstances relied on to support these grounds.

The submissions will be given to the Minister for Natural Resources and Mines and the Minister for Environment, Local Government, Planning and Women. After considering the submissions, the Ministers will decide whether to adopt the proposed SPP as notified, adopt it with modifications, or not adopt the proposed SPP. The Ministers will advise each principal submitter in writing of any decision and the reasons for that decision.

Honourable Stephen Robertson MP, Minister for Natural Resources and Mines

Honourable Desley Boyle MP, Minister for Environment, Local Government, Planning and Women

STATE PLANNING POLICY

PROTECTION OF EXTRACTIVE RESOURCES

NOT GOVERNMENT POLICY
For Consultation Purposes

PART 1—INTRODUCTION

1 State Planning Policy and State Planning Policy Guideline

(1) The State Planning Policy: *Protection of Extractive Resources* (the Policy) is a statutory instrument under the *Integrated Planning Act 1997*.

(2) The State Planning Policy Guideline: *Protection of Extractive Resources* (the Policy Guideline) provides advice about implementing the Policy, and is declared to be extrinsic material under the *Statutory Instruments Act 1992*, section 15.

(3) Terms used in the Policy and Policy Guideline have the same meaning as defined in the *Integrated Planning Act 1997*.

(4) The Glossary[1] explains particular words used in the Policy and the Policy Guideline.

PART 2—APPLICATION OF THE POLICY

2 Areas to Which the Policy Applies

(1) The Policy applies to the whole State, and has effect in local government areas with a Key Resource Area[2].

(2) In a Key Resource Area, the Policy applies—
- (a) in the resource/processing area; and
- (b) in the separation area; and
- (c) within 100 metres of the reserve boundary of the transport route[3]; and
- (d) to premises with direct vehicular access to the transport route.

(3) The Key Resource Area concept is illustrated in Annex 1. The Key Resource Areas are listed by local government area in Annex 2 and shown on maps in Annex 3.

3 Development to Which the Policy Applies

(1) The Policy applies to development that is making a material change of use of premises or reconfiguring a lot in Key Resource Areas.

4 Matters Outside the Scope of the Policy

(1) The Policy does not confer development approval for extractive industry development applications within a Key Resource Area; such applications are assessed in the usual manner through the Integrated Development Assessment System under the *Integrated Planning Act 1997*.

[1] Refer to the Policy Guideline Part 6.
[2] For the purpose of the Policy, a Key Resource Area refers to an area of State or regionally significant extractive resources.
[3] A transport route has not been identified for all Key Resource Areas.

PART 3—POLICY OUTCOME

5 Outcome sought by the Policy

(1) The outcome sought by the Policy is that the long-term availability of extractive resources in Key Resource Areas is maintained through planning and development assessment.

PART 4—MAKING OR AMENDING A PLANNING SCHEME

6 Achieving the Policy Outcome through the Planning Scheme

(1) The Policy outcome is achieved when making or amending a planning scheme by—
- (a) incorporating each Key Resource Area located within the local government area; and
- (b) allocating uses to areas within a Key Resource Area that are compatible with the existing or future extraction, processing and transportation of extractive materials, consistent with Part 5; and
- (c) making development in a Key Resource Area assessable having regard to the compatibility of uses and lots consistent with Part 5; and
- (d) incorporating assessment criteria in one or more applicable codes for assessable development consistent with Part 5; and
- (e) stating in the planning scheme or a planning scheme policy the appropriate information that may be requested for assessing development to which the Policy applies in a Key Resource Area.

PART 5—DEVELOPMENT ASSESSMENT

7 Achieving the Policy Outcome through Development Assessment

(1) The Policy outcome is achieved when a use or a lot is compatible with all existing and future extraction, processing and transportation of extractive materials. This will be achieved if a use or a lot—
- (a) in a **resource/processing area** is associated with either the extraction or processing of the extractive resource; and
- (b) in a **separation area** does not significantly increase the extent or degree of adverse effects on the amenity of persons living, working or congregating on the premises, arising from the extraction or processing of the extractive resource; and
- (c) within **100 metres of the reserve boundary of a transport route** does not significantly increase the extent or degree of adverse effects on the amenity of persons living, working or congregating on the premises arising from traffic transporting extractive materials; and
- (d) with **direct vehicular access to a transport route** does not significantly increase the extent or degree of adverse effects on the safety and efficiency of vehicles using the transport route to transport extractive materials.

8 Acceptable Circumstances for not Achieving the Policy Outcome

(1) The acceptable circumstances for not achieving the Policy outcome are—
- (a) a use or a lot is consistent with the planning scheme; or
- (b) a use or a lot—
  - (i) provides an overriding benefit to the State, regional or local community in social, economic or ecological terms that outweighs the long-term availability of the extractive resource; and
  - (ii) cannot reasonably be located elsewhere.

(2) However, in addition to subsection (1), for the circumstances to be acceptable, the adverse effects of the new use or lot on the existing viability of the extractive resource are to be reduced as much as is practicable.

PART 6—INFORMATION AND ADVICE ON THE POLICY

9 Relationship with other State Planning Policies

(1) The Key Resource Areas attached to this State Planning Policy have been formulated in consideration of existing State Planning Policies and satisfy the public interest considerations of those State Planning Policies at a strategic level.

(2) Applications for extractive development must be assessed for their compliance with all applicable State Planning Policies, policies, and assessment criteria.

10 Sources of Information and Advice

(1) The Queensland Department of Natural Resources and Mines can provide advice on the implementation of the Policy, particularly in regard to the Key Resource Areas.

(2) The Queensland Department of Local Government, Planning, Sport and Recreation can provide advice on the implementation of the Policy, particularly in regard to reflecting the Policy in a planning scheme, and the operation of the Integrated Development Assessment System.

ANNEX 1

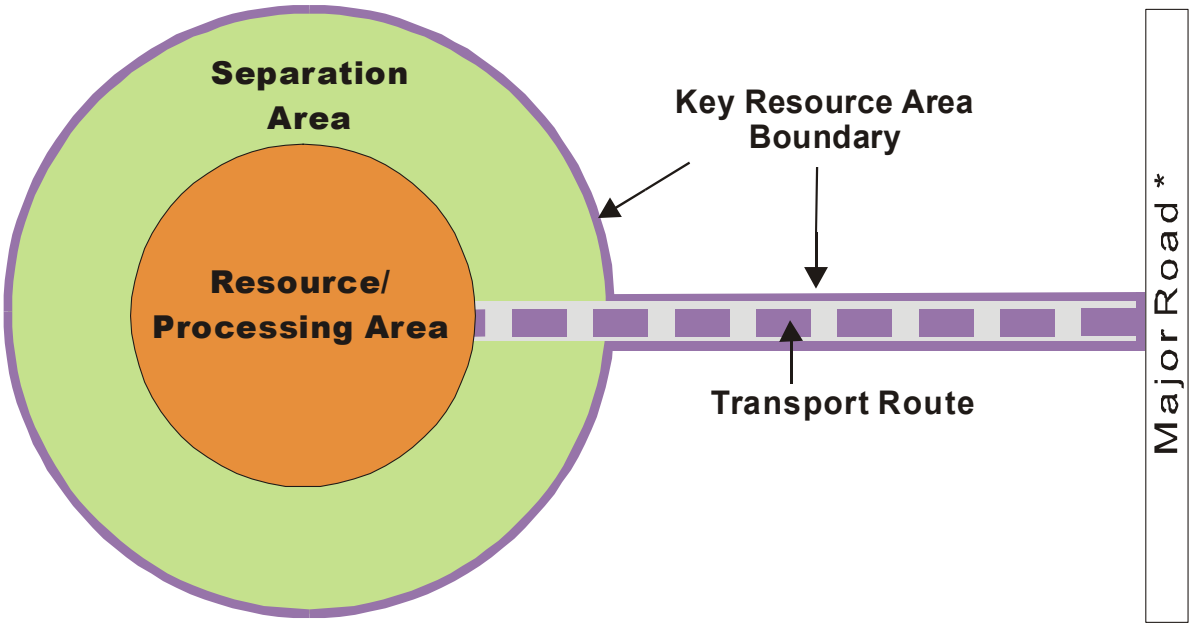
Key Resource Area Concept

A1.1 The following diagram illustrates the Key Resource Area concept. A Key Resource Area includes the following elements:

(a) the resource/processing area; and

(b) the separation area around the extractive resource/processing area; and

(c) the associated transport route[4] and premises within 100 metres of the reserve boundary or with direct vehicular access.



[4] A transport route has not been identified for all Key Resource Areas.

*In a few instances, the transport route goes to a rail line rather than a major road.

ANNEX 2

Key Resource Areas

A2.1 The Policy applies to the following Key Resource Areas[5]:

Local Government Area	Key Resource Area	KRA No.
Atherton Shire	Wongabel	9
Beaudesert Shire	Bromelton	61
Beaudesert Shire	Clutha Creek Sands	94
Beaudesert Shire	Mundoolun Connection Sands	95
Booringa Shire	Marbango	84
Bowen	West Euri Creek	37
Brisbane City	Ferny Grove	39
Brisbane City	Kholo Creek	41
Brisbane City and Ipswich City	Kholo Sands	80
Brisbane City	Mount Coot-tha	42
Brisbane City and Pine Rivers Shire	Pine Rivers North	59
Brisbane City and Pine Rivers Shire	Pine Rivers South	60
Bungil Shire	Warrian	85
Burdekin	The Rocks	28
Burnett Shire	Bargara	86
Burnett Shire	Innes Park	87
Burnett Shire	Tantitha	97
Caboolture Shire	Beachmere	43
Caboolture Shire	Bracalba	44
Caboolture Shire	Meldale / Donnybrook	45
Caboolture Shire and Pine Rivers Shire	Narangba	46
Caboolture Shire	Ningi	47
Cairns City	Barron River Flats	10
Cairns City	Mountainview	11
Cairns City	Redlynch	12
Cairns City	Wright Creek	13
Calliope Shire	Taragoola	19
Calliope Shire	Yarwun	20
Caloundra City	Glasshouse	48
Caloundra City	Glenview	50
Caloundra City	Meridan Plains	49
Caloundra City	Sunrock	51
Cooloola Shire	Meadvale	88
Cooloola Shire and Maroochy Shire	Moy Pocket	89
Crows Nest Shire	Ravensbourne	1
Esk Shire	Dingyarra	73
Esk Shire	Glen Arden	74
Esk Shire	Harris Terrace	75

[5] There are 98 Key Resource Areas numbered from 1 to 100, excluding numbers 38 and 40, which were deleted during development of the Policy.

Local Government Area	Key Resource Area	KRA No.
Esk Shire and Ipswich City	Hills Terrace	77
Esk Shire	Schmidt's Terrace	76
Esk Shire and Ipswich City	Summerville and Sapling Pocket	83
Esk Shire	Wiralee	78
Fitzroy Shire	Benedict Road	18
Fitzroy Shire and Livingstone Shire	Pink Lily	22
Gatton Shire and Toowoomba City	Harlaxton	8
Gatton Shire	Mount Cross	79
Gold Coast City	Blue Rock	62
Gold Coast City and Logan City	Carbrook / Eagleby	63
Gold Coast City	Charlies Crossing	64
Gold Coast City	Jacobs Well	65
Gold Coast City	Nerang	66
Gold Coast City	Northern Darlington Range	67
Gold Coast City	Oxenford	68
Gold Coast City	Reedy Creek	96
Gold Coast City	Stapylton	69
Gold Coast City	West Burleigh	70
Herberton Shire	Ravenshoe	14
Hervey Bay City	Dundowran	90
Hervey Bay City	Dundowran West	91
Hinchinbrook Shire	Mount Cordelia	29
Inglewood Shire	Inglewood	2
Ipswich City and Esk Shire	Hills Terrace	77
Ipswich City and Brisbane City	Kholo Sands	80
Ipswich City	Mount Marrow	81
Ipswich City	Purga	82
Ipswich City and Esk Shire	Summerville and Sapling Pocket	83
Isis Shire	Redridge	92
Johnstone Shire	Coorumba Road	15
Johnstone Shire	Pin Gin Hill	16
Jondaryan Shire and Toowoomba City	Glenvale	4
Jondaryan Shire	Wellcamp Downs	3
Livingstone Shire	Nerimbera	21
Livingstone Shire and Fitzroy Shire	Pink Lily	22
Logan City and Gold Coast City	Carbrook / Eagleby	63
Logan City and Redland Shire	Mount Cotton	71
Logan City and Redland Shire	West Mount Cotton	72
Mackay City	Farleigh	24
Mackay City	The Cedars	23
Mareeba Shire	Titchum Creek	17
Maroochy Shire	Bli Bli	52
Maroochy Shire	Image Flat	53
Maroochy Shire and Cooloola Shire	Moy Pocket	89
Maroochy Shire	Toolborough Road	55
Maroochy Shire	Yandina Creek	54
Nanango Shire	Hodgleigh	93

Local Government Area	Key Resource Area	KRA No.
Nebo Shire	Waitara	33
Noosa Shire	Ringtail Creek	56
Noosa Shire	Wahpunga Range	57
Pine Rivers Shire and Caboolture Shire	Narangba	46
Pine Rivers Shire	Whiteside	58
Pine Rivers Shire and Brisbane City	Pine Rivers North	59
Pine Rivers Shire and Brisbane City	Pine Rivers South	60
Redland Shire and Logan City	Mount Cotton	71
Redland Shire and Logan City	West Mount Cotton	72
Rockhampton City	Peak Hill	98
Rosalie Shire	Malu	5
Sarina Shire	Hatfield	25
Thuringowa City	Black River	30
Thuringowa City	Bohle	31
Thuringowa City	Pinnacles	32
Toowoomba City and Jondaryan Shire	Glenvale	4
Toowoomba City and Gatton Shire	Harlaxton	8
Townsville City	Cape Cleveland	34
Townsville City	Roseneath East	35
Townsville City	Roseneath West	36
Wambo Shire	Jimbour	6
Warwick Shire	Braeside	7
Whitsunday Shire	Foxdale	26
Whitsunday Shire	North Gregory	27
Winton Shire	Bladensburg	99
Winton Shire	Windemere	100

ANNEX 3

Maps of Key Resource Areas

State Planning Policy 2/07 Guideline

Protection of Extractive Resources

Queensland the Smart State

Queensland Government

State Planning Policy 2/07
Guideline

Protection of Extractive Resources

ISBN 978-1-7417-2570-4

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TABLE OF CONTENTS

1. THE POLICY GUIDELINE

1.1 The State Planning Policy Guideline: *Protection of Extractive Resources* (the Policy Guideline) provides information and advice on implementing the State Planning Policy: *Protection of Extractive Resources* (the Policy).

1.2 The Policy cites the Policy Guideline as 'extrinsic material' under the *Statutory Instruments Act 1992*, giving the Policy Guideline legal status in assisting in the interpretation of the Policy.

2. POLICY OUTCOME

Need to protect extractive resources

2.1 The Policy outcome is to identify those extractive resources of State or regional significance where extractive industry development is appropriate in principle, and protect those resources from developments that might prevent their future extraction.

2.2 Extractive resources are deposits of sand, gravel, quarry rock, clay and soil. They are essential to the State and regional economies, and the community, as the primary raw materials for the construction industry. Extractive resources are extracted and processed for use in concrete, road bases, asphalt, rail track ballast, breakwater construction, drainage materials, mortar and plaster, and a range of other products.

2.3 Extractive resources are high volume, low value products, and the economic viability of an extractive resource depends on its proximity to markets and urban areas. Encroachment by incompatible development can restrict or prevent the extraction, processing and transportation of extractive resources to markets. The amenity of the community surrounding the extractive resource and transport route also needs to be protected from any potential adverse effects of extractive industry.

2.4 Under the *Integrated Planning Act 1997* a local government, both in plan making and in development assessment, is required to advance the Act's purpose. This includes, amongst other matters, the sustainable use of non-renewable natural resources such as extractive resources. The Act recognises extractive deposits of economic value as 'valuable features', which are a component of the 'core matters' the Act requires planning schemes to address.

3. APPLICATION OF THE POLICY

Effect of the Policy

3.1 The Policy is a statutory instrument under the *Integrated Planning Act 1997*. Under the Act the Policy has effect—

(a) in development assessment when the Policy is not appropriately reflected in the applicable planning scheme;
(b) when planning schemes are made or amended; and
(c) when land is designated for community infrastructure.

Areas to which the Policy applies

3.2 The Policy identifies extractive resources of State or regional significance as Key Resource Areas. The criteria for determining extractive resources of State and regional significance are described in Appendix 1.

3.3 The Policy applies to premises within Key Resource Areas. Key Resource Areas contain the following elements—

(a) a resource/processing area;
(b) a separation area; and
(c) an associated transport route (which also includes a separation area) where such a link is needed from the resource/processing area to a major road or railway.

3.4 The Key Resource Areas are listed by local government area in Annex 2 and are shown on maps in Annex 3 of the Policy. Appendix 3 of the Policy Guideline provides information about each Key Resource Area.

3.5 The resource/processing area indicates the extent of the extractive resource and any existing or future operational areas associated with extraction and processing of the resource. Extraction can include ripping, blasting or dredging and processing can include crushing, screening, washing, blending or grading, wastewater treatment, and associated activities can include storage, rehabilitation, loading, transportation, administration, and maintenance facilities.

3.6 The separation area surrounds the resource/processing area and is needed to maintain separation of people from undesirable levels of noise, dust, ground vibration, or air blast overpressure[1] that may be produced as residual impacts from existing or future extraction or processing of the extractive resource.

3.7 The mapped extent of the resource/processing area was based upon the best information available when the Policy was prepared. However, it may be possible that an extractive resource deposit may extend beyond the boundary of the resource/processing area. Where this occurs extractive industry development should only take place in the separation area where the function of the separation area as a buffer is not compromised.

[1] See Section 6, Glossary.

3.8 The dimensions of the separation area for the resource/processing area are based upon the following minimum distances—

(a) 1000 metres where the extraction or processing of the extractive resource involves blasting or crushing (namely rock); or

(b) 200 metres for any other extractive resource not involving blasting or crushing (namely sand, gravel, clay and soil).[2]

3.9 These are indicative distances only and the extent of the separation area shown in each Key Resource Area has been modified to reflect local circumstances where known, such as topographical features that provide a natural buffer. Key Resource Areas may have also been modified to reflect existing development commitments.

3.10 The transport route indicates the route used to transport extractive resources to the nearest main road or railway. Generally road haulage is used to transport extractive resources, but in some circumstances resources could be transported by rail transport, for example for transporting rail ballast where the extractive resource deposit is adjacent to rail (some rail ballast is trucked to a distribution centre at a rail siding).

3.11 The desirable separation distance between a transport route's road or rail reserve boundary and an incompatible development is 100 metres. Outside this distance the potential adverse effects of noise, dust, and ground vibration associated with the transportation of extractive resources are likely to be minor.

Development to which the Policy applies

3.12 The Policy applies to the development described in section 4 of the Policy. It should be noted that the Policy does not apply to building work and therefore does not apply to development applications assessable only against the *Building Regulation 2006*.

Matters outside the scope of the Policy

3.13 In general, the Policy does not address the detailed aspects of development approval for extractive industries or the details associated with extractive industry operations eg. extracting, processing and transporting extracted resources, as such matters are regulated under the *Environmental Protection Act 1994*, the *Vegetation Management Act 1999*, and through development assessment under the *Integrated Planning Act 1997*.

[2] These separation distances are based on the accumulated wisdom of other jurisdictions around Australia and overseas but more specifically the following sources. The 1000 metres separation distance for blasting operations is based on—

- Blastronics Pty. Ltd., 1999: Impact of Proposed Coomera Island Development on Nucrush Quarry. Report for Nucrush and Prodap Services. September 1999. Blastronics Systems and Services, Pty. Ltd., Brisbane. #C99084Blasting Impact Report.

The 200 metres separation distance for non-blasting operations including sand and gravel operations is based on—

- Kershaw & Co., 1996: Environmental Impact Statement – Wallace Road Sand Operation. Report for Excel Quarries Pty. Ltd. 2 vols. March 1996. Ref: 566.048. Kershaw & Co., Taringa, Queensland.
- Kershaw & Co., 1997: Environmental Impact Statement – Proposal to Rezone General Industry Zoned Land to Extractive Industry – Lot 88 Crown Plan M31114, Parish of Warner, Johnstone Road, Brendale. Report for Alberton Investments Pty. Ltd. February 1997. Ref: 502_022. Kershaw & Co., Taringa, Queensland.
- Yastrow, P., 1990: Laku Landing Sound Level Analysis. Viewed 7 February 2006 at www.laku.com. Website by Laku Landing – Lake Tournament Water Ski Association, Windsor, Colorado, USA.

3.14 However the Policy does state that development which is associated with either extraction or processing of the extractive resource is consistent with the Policy and that development for extracting or processing the extractive resource in certain specified Key Resource Areas[3] should avoid or mitigate potential adverse impacts on areas having state or regional biodiversity significance[4].

3.15 Other matters outside the scope of the Policy include:

(a) the extraction of riverine quarry materials in non-tidal watercourses[5];
(b) the dredging of material from the bed of tidal waters under the *Coastal Protection and Management Act 1995*;
(c) minerals and mining under the *Mineral Resources Act 1989*. Minerals include metal ores, coal, clay for ceramic purposes, foundry sand, limestone and silica sand mined and used for their chemical properties, and rock mined in block or slab form for building or monumental purposes; and
(d) Key Resource Areas applied solely to mineral resources as identified by the Department of Mines and Energy.

4. MAKING OR AMENDING A PLANNING SCHEME

Appropriately reflecting the Policy in a planning scheme

4.1 Local governments listed in Annex 2 of the Policy, when making or amending their planning scheme, must appropriately reflect the Policy. This is to ensure the State's interests are interpreted in the local context when planning for future development, and during the assessment of development applications under the planning scheme. The Policy outcome must be balanced and integrated with other State, regional and local interests.

4.2 The planning scheme should reflect the Policy to an extent that satisfies the Minister for Local Government, Planning and Sport. The Minister[6] will advise a local government if the Policy is appropriately reflected in the planning scheme, having considered whether or not the State's interests would be adversely affected.

Identifying Key Resource Areas

4.3 Planning scheme map(s) should identify each element of the Key Resource Area shown in Annex 2 of the Policy on a cadastral map at a scale sufficient to identify individual lots. The maps should show the following:

(a) the extent of the resource/processing area;
(b) the extent of the separation area; and
(c) the transport route and where possible the transport route's separation area.

[3] See Annex 4 of the Policy for a list of the Key Resource Areas affected by this section.
[4] State biodiversity values are set out in the Policy Guideline under Appendix 3: Key Resource Area Information regarding each of the resource/processing areas.
[5] Licences and approvals specifically for the extraction of riverine quarry materials are administered under the *Water Act 2000*. The Department of Natural Resources and Water should be consulted in relation to resource allocation prior to the submission of a formal development application under the *Integrated Planning Act 1997*.
[6] Acting for the State Government on the advice of the Department of Mines and Energy and the Department of Local Government, Planning, Sport and Recreation.

4.4 The most appropriate way of presenting the mapped information will depend on the structure of the particular planning scheme. Key Resource Areas can be included as one or more zones or overlays[7] to which specific development assessment provisions apply.

4.5 A local government may review the extent of a Key Resource Area with regard to local circumstances. This review will be undertaken as part of the planning scheme preparation and amendment process[8], in full consultation with the community, the Department of Mines and Energy and all other relevant stakeholders.

4.6 The scope of the review will vary depending on the availability of information, and the existing or potential pressures arising from the encroachment of incompatible development on the extractive resource. The Key Resource Area, for example, may be revised if an extractive resource is exhausted or if new information is made available regarding the extent of the extractive resource.

Ensuring that development in Key Resource Areas is compatible with achieving the purpose of the Policy

4.7 The planning scheme's land use strategies should give preference to future land uses that would achieve the Policy's development outcome as outlined in section 7 of the Policy. The development to which the Policy applies also needs to be considered when allocating land uses. Appendix 2 provides information on the type of development which might be compatible in each element of a Key Resource Area.

4.8 In general, land use strategies that do not increase the numbers of people in the Key Resource Area would achieve the Policy outcome. In particular, the land use strategy should focus on not increasing the number of people living in the separation area for the resource/processing area and the separation area for the transport route. The strategies should also seek to minimise the potential adverse effects from existing or future extractive industries on people working or congregating in the separation area. The land use strategies should also seek to address concerns about the safe and efficient transportation of extractive resources along the identified transport route.

4.9 The planning strategies should also seek to ensure that extractive industry development should not compromise the function of the separation area in providing a buffer between extractive/processing operations and any incompatible uses outside the separation area.

Development to be made assessable or self-assessable

4.10 The planning scheme should ensure that the development to which the Policy applies should be made assessable or self-assessable. Whether development is made assessable or self-assessable depends on whether it is possible to identify all relevant assessment criteria in a precise way that does not require any interpretation/discretion. If that is possible, self-assessable is the appropriate assessment category.

[7] For further information about this suggested approach for planning schemes, refer to the *IPA Plan Making Guideline 1/02* published by the Department of Local Government and Planning.
[8] See Schedule 1 of the *Integrated Planning Act 1997*.

Incorporating assessment criteria

4.11 For assessable or self-assessable development, the planning scheme should incorporate assessment criteria in one or more applicable codes consistent with achieving the outcomes of Part 4 of the Policy. The codes should address all relevant aspects, including works associated with the development.

4.12 The suggested approach to incorporating assessment criteria is to have an overlay map showing a Key Resource Area with assessment criteria in one or more codes. See Appendix 2 for more advice on assessment criteria.

Information required for development assessment

4.13 A planning scheme or planning scheme policy should state the information that may be requested from an applicant for assessing development in a Key Resource Area.

4.14 It is recommended that this information be stated in a planning scheme policy, since it is used to support the operation of the planning scheme. An advantage of using a planning scheme policy is that the information can be regularly updated without having to amend the planning scheme.

4.15 A planning scheme or planning scheme policy could also state that advice may be sought by the local government, for example from the Mineral and Extractive Planning Unit of the Department of Mines and Energy. It should be made clear that this action is neither mandatory nor an imposition upon the applicant, and is not a requirement of the statutory referral processes under the Integrated Development Assessment System (IDAS) of the *Integrated Planning Act 1997*.

Planning for extractive resources of local significance

4.16 A local government is encouraged to incorporate similar outcomes for other extractive resources of local significance in their planning scheme as 'Local Resource Areas'. However, it is essential that the significance of the extractive resource area identified, whether State or local, be distinguished in the planning scheme, since the justification for the outcomes sought may be different.

5. DEVELOPMENT ASSESSMENT

Achieving the Policy outcome through development assessment

5.1 The Policy outcome is achieved when development is compatible with the existing or future extraction, processing and transportation of extractive resources from a Key Resource Area. Part 4 of the Policy provides specific criteria for achieving this compatibility for each element of the Key Resource Areas.

5.2 The rationale for determining development compatibility vary for each of the component parts of a KRA as follows:

(a) within the resource/processing area, development should not alienate or add a significant cost or other impediment to undertaking a future extractive industry development, thereby potentially limiting the long-term availability of extractive resource for extractive industries.

(b) within the separation area, development should not result in a use that would be sensitive to potential adverse environmental effects from extractive industry operations.

(c) within the transport route's separation area, development should not increase the number of residents who would suffer potential adverse effects of noise, dust and ground vibration from trucks hauling extractive materials along the route.

(d) alongside the transport route, development should not adversely affect the safe and efficient use of the transport route by vehicles transporting extractive resources.

5.3 Incompatible developments give rise to land use conflicts and potential objections to extractive industry and related operations. Further guidance about assessing the compatibility of development in a Key Resource Area is provided in Appendix 2.

5.4 The resource/processing areas of certain Key Resource Areas may have state significant biodiversity, ecological, conservation, cultural heritage and indigenous values that may not be compatible with extractive industries. Where known, these values have been identified in the Special Considerations information provided for the relevant Key Resource Area in Appendix 3. An application for extractive industry in these particular Key Resource Areas will need to be assessed on a case-by-case basis to ensure that any potential adverse impacts on these values are avoided or mitigated, having regard to maintaining the long term availability of the extractive resource.

5.5 It should be noted that the compatibility of the proposed reconfiguring of a lot should include consideration of any additional self-assessable uses that could occur as a result of reconfiguring of the lot. Additionally if a development is situated in more that one element of a Key Resource Area it must be compatible with all the elements.

5.6 While the Policy does not apply to a domestic activity, the sensitivity and high level of amenity desired for residential uses means that the adverse effects of existing or future extractive industry should be minimised through design and construction as far as practicable. See Appendix 2, Table B for some advice on mitigating the adverse effects of existing or future extractive industry through design and construction measures.

Acceptable circumstances for not achieving the Policy outcome

5.7 The Policy sets out the limited circumstances when development that does not achieve the Policy outcome is acceptable. These circumstances are when a development is a development commitment[9] or provides an overriding community benefit that cannot be achieved by the development at a different location.

[9] See Section 6, Glossary for a definition of development commitment.

Overriding community benefit

5.8 For the purposes of this SPP, development provides an overriding community benefit when it is demonstrated that the development would result in social, economic or ecological benefits for the community that would outweigh the potential loss of the extractive resources on the development site to the community. Circumstances where an incompatible development **could** provide an overriding benefit are those that would significantly—

(a) improve the community's access to essential services;
(b) increase long-term employment opportunities; or
(c) facilitate synergies with existing activities in the vicinity.

5.9 If development would restrict or prevent extractive industry, the social, economic and ecological implications of using alternative sources of extractive resources should be assessed. This assessment should include the effects of transporting extractive resources from other sources, including the effects on—

(a) amenity in the vicinity of the route used to transport the extractive materials;
(b) costs of extractive materials for building construction and infrastructure;
(c) pollution levels from increased exhaust emissions;
(d) road maintenance costs;
(e) transport costs for extractive industry; and
(f) transport safety and efficiency.

Development cannot be reasonably located elsewhere

5.10 Extractive industry does not have flexible location options because the extractive resources are fixed, finite and are limited in occurrence. Other uses (in particular residential uses) are unlikely to override the long-term availability of an extractive resource because they have more flexible location options.

5.11 An assessment of alternative premises for development should amongst other matters—

(a) identify the location requirements of the development, including physical site characteristics, access, and servicing;
(b) identify premises that meet these location requirements;
(c) evaluate the identified premises in terms of the planning scheme outcomes (or adjoining planning scheme if suitable land is identified in an adjoining local government area); and
(d) assess the respective ecological, social, or economic implications of each alternative premises.

Adverse effects must be minimised

5.12 When development has demonstrated that it is a development commitment or has an overriding community benefit, the adverse effects of the development on maintaining the availability of the Key Resource Areas for existing or future extractive industries should be reduced to the greatest extent practicable. The development should be designed wherever practicable to minimise the potential for any adverse effects from an extractive operation on persons or uses. For example, adverse effects may be reduced by measures such as buffer areas, earth mounding, landscaping, or design and construction measures including double glazing. Appendix 2, Part B provides guidance on how to minimise these adverse effects from extractive industry.

Information required for development assessment with regard to the Policy

513 Where further clarification is required about how a proposed development achieves the Policy outcome, the assessment manager should make an information request to the applicant and seek advice from the relevant State agencies, in particular the Department of Mines and Energy.

6. GLOSSARY

6.1 The following terms used in the Policy Guideline and are explained below:

Air blast overpressure
Air blast overpressure results when an explosion in rock produces a pressure wave that travels through the atmosphere.

Buffer
A "buffer" is a management technique to minimise the adverse effects of the extractive industry. These techniques may include the use of a separation distance, natural topography, earth bunds or vegetation zones.

Development commitment
Development commitment means any of the following—

(a) a development with a **current development approval**; **or**
(b) **a material change of use** clearly consistent with the purposes of codes (or equivalent policy intents) of the relevant zone (or equivalent) in the planning scheme and, if applicable, the regulatory provisions of the SEQ Regional Plan; **or**:
(c) **reconfiguring a lot** consistent with the purposes of codes (or equivalent policy intents) of the relevant zone (or equivalent) in the planning scheme and, if applicable, the regulatory provisions of the SEQ Regional Plan.

Domestic activity
Domestic activity means the use of premises for a residential purpose and associated activities comprising any one or more of the following—
(a) a single residential dwelling on an existing lot;
(b) home based business employing no more than two non-resident people; or
(c) relatives accommodation (e.g. granny flat).

Extractive industry
Extractive industry is the extraction and processing of extractive resources and associated activities to produce extractive materials, including their transportation to markets.

Extractive resources
Extractive resources are natural deposits of sand, gravel, quarry rock, clay, and soil extracted from the earth's crust and processed for use in construction. The products processed from extractive resources are sometimes termed extractive materials or construction aggregates. Extractive resources do not include minerals under the *Mineral Resources Act 1989* such as metal ores, coal, clay for ceramic purposes, foundry sand, limestone and silica sand mined and used for their chemical properties, and rock mined in block or slab form for building or monumental purposes.

Resource/processing area
The resource/processing area of a Key Resource Area indicates the extent of the extractive resource and any existing or future processing operations. The extraction of extractive materials can include ripping, blasting or dredging; the processing of extractive materials can include crushing, screening, washing, blending or grading, wastewater treatment, and associated activities can include storage, rehabilitation, loading, transportation, administration, and maintenance facilities.

Ground vibration
Ground vibration is caused when an explosion in rock produces a pressure wave that travels through the ground.

Major road
A major road is a road link the function of which is consistent with the proposed extractive resource traffic requirements and is generally a State controlled road.

Separation area for a resource/processing area
The area surrounding the resource/processing area needed to maintain separation of people from undesirable levels of noise, dust, ground vibration, or air blast overpressure that may be produced as residual impacts from existing or future extraction or processing of the extractive resource.

State or regionally significant biodiversity areas
Areas determined as having State or regional biodiversity significance through a Biodiversity Planning Assessment or surrogate process undertaken by the Environmental Protection Agency. Biodiversity Planning Assessments show an area according to specified biodiversity values.

Transport route
The transport route indicates the route used to transport extracted resources to markets. The transport route is a road or rail link from the boundary of the resource/processing area to a major road or railway.

Transport route's separation area
The area surrounding the transport route needed to maintain separation of people from undesirable levels of noise, dust and ground vibration produced as residual impacts from the transportation of extractive resources.

APPENDIX 1: CRITERIA FOR STATE SIGNIFICANCE

Criteria for State or regional significance

A1.1 An extractive resource is of State or regional significance and therefore identified as a Key Resource Area, if it meets any of the following criteria:

1. Size: The size of the extractive resource is equal to or greater than the annual demand for the commodity type in its region or sub-region; or
2. Production: The resource is capable of producing 5 percent of annual demand for the commodity type in its region or sub-region; or
3. Market: The resource can supply more than one significant part of the region or sub-region; or
4. Scarcity: The resource has particular physical properties that are scarce in the region or sub-region; or
5. Specialised: Specialised resources needed for strategic infrastructure.

Using the criteria for State or regional significance

A1.2 There are no extractive resources in Queensland that serve a State-wide need. Most serve a region or a sub-region at the most. Therefore, significance to the State is based on the actual or potential contribution of a resource to the development of its region.

A1.3 An assessment of a resource against the criteria in A1.1 will determine whether or not a site is likely to warrant consideration as a resource of State or regional significance. If a resource meets any of those criteria, the resource area's social, cultural and environmental values are considered in defining the boundaries of a potential Key Resource Area. The area is then nominated for approval as a Key Resource Area under the Policy. A development assessment process is still required to determine if and how an extractive industry operation may proceed.

Review of Key Resource Areas

A1.4 It is intended to review the state or regional significance of a Key Resource Area on an ongoing basis in light of new information pertaining to the actual or potential contribution of a resource to the development of its region.

APPENDIX 2: COMPATIBILITY OF DEVELOPMENT IN KEY RESOURCE AREAS

A2.1 The following material is not intended to be incorporated directly into a planning scheme, but should be used to help devise appropriate detailed measures for achieving the Policy's outcome and integrating those measures with other provisions of the planning scheme. Where the Policy has not been appropriately reflected in a planning scheme, this appendix should be used to assist in interpreting the Policy in development assessment.

A2.2 This appendix refers to scheme measures in terms of overlays and associated assessment criteria, and is consistent with the approach and terminology suggested for planning schemes in the *IPA Plan Making Guideline 1/02* published by the Department of Local Government and Planning.

Extractive resources overlay

A2.3 The most appropriate way of presenting the mapped information will depend on the structure of the particular planning scheme. Key Resource Areas can be included as one or more zones or overlays to which specific development assessment provisions apply.

Using the tables

A2.4 The tables below set out the following information—

- **Column 1: Type of development made assessable or self-assessable** – a material change of use or reconfiguring a lot that would result in development likely to be incompatible in a Key Resource Area should be made assessable or self-assessable. Whether development is made assessable or self-assessable depends on whether it is possible to identify all relevant assessment criteria in a precise way that does not require any interpretation/discretion. If that is possible, self-assessable is the appropriate assessment category. It is not necessary to make compatible development assessable development under the extractive resources overlay. However this development could be subject to other relevant assessment criteria under the planning scheme.

- **Column 2: Specific outcomes** – these specific outcomes provide the basis for a local government to devise the relevant assessment criteria and can be used to assess the compatibility of development in a Key Resource Area.

- **Column 3: Solutions** – these solutions provide the basis for a local government to devise solutions for the planning scheme code(s) in the context of the planning scheme area. A solution can be made an acceptable solution when it can be refined in a way that results in precise criteria requiring no exercise of discretion to determine whether a development proposal complies.

- **Column 4: Comments –** This column provides advice about—
  - interpreting the assessment criteria;
  - what information is likely to be required to enable an adequate assessment; and
  - information about, or cross references to, other relevant matters.

A. Devising appropriate assessment measures to achieve the Policy outcome:

Type of development made assessable or self-assessable	Specific outcomes	Solutions	Comments
Resource/Processing Area – to material change of use and reconfiguring a lot.	**1.** The long term availability of the extractive resource for extraction or processing is maintained.	**1.1** Development is for extractive industry or directly associated with extractive industry; **or** **1.2** Development is for other uses that would not constrain existing or future extractive activities; **or** **1.3** Development is for a temporary use.	**Note for 1.2:** Other development that wouldn't constrain existing or future extractive industries could include non-intensive agricultural uses including forestry or other uses that involve minimum capital investment. **Note for 1.3** Temporary uses could include uses that are short term in nature such as recreational uses. The applicant will be expected to demonstrate to the satisfaction of the assessment manager that the use would operate on a temporary basis.
	2. Development in the resource/processing area avoids or mitigates adverse impacts on areas of state or regional biodiversity significance.	**2.1** No solution provided.	**Note for 2.1:** Applications will be assessed on a case-by-case basis. The applicant will be expected to demonstrate to the satisfaction of the assessment manager and any concurrence agency that a specific extractive industry application can achieve the specific outcome.

Type of development made assessable or self-assessable	Specific outcomes	Solutions	Comments
Separation Area for a resource/processing area – to material change of use and reconfiguring a lot **except** those for— (i) a caretaker's residence for extractive industry; (ii) agriculture not involving intensive animal husbandry; (iii) forestry; (iv) nature conservation; (v) land fill or refuse transfer station; and (vi) passive recreational uses such as open space.	**3.** Development does not increase the number of people **living** in the separation area.	**3.1** No solutions provided.	**Note for 3:** Development that increases residential densities or increases the numbers of lots that have a residential component in the separation area for a resource/processing area are not supported**.**
	4. To the greatest extent practicable development minimises the potential adverse effects from existing or future extractive industries on people **working** or **congregating** in the separation area.	**4.1** The numbers of people working or congregating in the separation area are not increased; **or** **4.2** Development is compatible with the potential effects arising from existing or future extractive industry; **or** **4.3** Development incorporates design, orientation, and construction measures that mitigate the potential adverse effects from an existing or future extractive industry to acceptable levels; **or** **4.4** The use operates outside the normal hours of operation for existing or future extractive industry of 6am to 6pm (Monday to Friday) and 6am to 12pm (Saturday).	**Note for 4.2:** Some uses other than those listed in column 1 may be compatible with the potential effects arising from existing or future extractive industry. These uses may create one of more of the effects associated with an extractive industry operation e.g. noise or ground vibration. This Policy does not suggest that these uses are suitable in the separation area merely that they may be compatible with existing or future extractive industry and should be assessed on their merits. **Note for 4.3:** The applicant will be expected to demonstrate to the satisfaction of the assessment manager that people associated with the use would not be adversely affected by the effects of noise, dust, ground vibration, or air blast overpressure from an existing or future extractive industry. See Table B of this appendix for more information on how this can be achieved. **Note for 4.4:** The hours listed in 4.4 are generally associated with the operation of extractive industries but an extractive industry could have extended hours of operation and the uses would need to operate outside these times.

Type of development made assessable or self-assessable	Specific outcomes	Solutions	Comments
	5. Extractive industry development does not compromise the function of the separation area in providing a buffer between extractive/processing operations and any incompatible uses outside the separation area.	**5.1** Extractive industry development avoids any adverse impacts on existing development or development foreshadowed by the planning scheme outside of the separation area.	**Note for 5.1:** The applicant will be expected to demonstrate to the satisfaction of the assessment manager that people would not be adversely affected by the effects of noise, dust, ground vibration, or air blast overpressure from an extractive industry development in the separation area.
Transport route's separation area – to material change of use and reconfiguring a lot.	**6.** Development does not increase the number of people **living** in the transport route's separation area.	**6.1** No solutions provided.	**Note for 6:** Development that increases residential densities or increases the numbers of lots that have a residential component in the transport route's separation area are not supported**.** Where lots have land both within and outside the separation area, a residential use of the lot could be approved consistent with this Policy provided dwellings are located outside the separation area part of the lot. 'Building envelopes' that limit the location of the dwelling should be included in building proposals and/or conditions on development approvals for a material change of use and/or reconfiguring a lot. While the Policy is silent on the increases in the numbers of people working or congregating in the transport route's separation area all due care should be taken to minimize the potential impacts from the transportation of extractive materials on people working or living in the transport route's separation area. See Table B of this appendix for more information on how this can be achieved.

Type of development made assessable or self-assessable	Specific outcomes	Solutions	Comments
Operational works associated with the creation or upgrade of a vehicular access point to the **transport route.**	**7.** Development will not adversely affect the safe and efficient operation of vehicles transporting extractive materials.	**7.1** The number of properties with access points to the transport route is not increased; **or** **7.2** Access points are designed to avoid adversely affecting the safe and efficient operation of vehicles transporting extractive materials.	**Note for 7.2:** Local governments should consider specifying minimum access requirements that are appropriate to the classification level of the transport route. The 'Road Planning and Design Manual' published by the Queensland Department of Main Roads provides advice on how safe and efficient access can be achieved.

B. Mitigating potential adverse effects from existing and future extraction, processing and transportation of extractive materials where there is a development commitment or overriding need in the public interest

Applicable development	Specific outcomes	Solutions	Comments
Material change of use and reconfiguring a lot in a Key Resource Area.	**8.** Development mitigates the potential adverse effects of noise, dust, ground vibration, or air blast overpressure from an existing or future extraction, processing and transportation of extractive materials to the greatest extent practicable.	**8.1** Development incorporates design, orientation and construction measures that mitigate the potential adverse effects from existing or future extraction, processing and transportation of extractive materials by: • Locating buildings and structures the greatest distance practicable from the resource/processing area and associated transportation route; and • designing buildings so the areas where people live, work and congregate (habitable rooms) are furthermost from the resource/processing area and associated transportation route; and • minimising openings in walls closest to these effects; and • providing mechanical ventilation to living areas sensitive to these effects; and • using appropriate construction insulation and glazing materials.	**Note for 8.1:** The applicant will be expected to demonstrate to the satisfaction of the assessment manager that the use would not be adversely affected by the effects of noise, dust, ground vibration, or air blast overpressure from an existing or future extractive industry with respect to the sensitivity of the use. The definition of habitable rooms is in the Building Code of Australia. Designing dwellings to achieve this requirement may have design and siting implications addressed by separate codes in the planning scheme. The 'Road Traffic Noise Management Code of Practice' published by the Queensland Department of Main Roads provides guidance on noise attenuation measures. Also refer to Australian Standard 3671-1989 Acoustic Road Traffic Noise Intrusion – Building Siting and Construction and AS2107-1987 Acoustics.

APPENDIX 3: KEY RESOURCE AREA INFORMATION

A3.1 Information regarding each Key Resource Area is provided in numerical order.

RAVENSBOURNE KEY RESOURCE AREA – KRA 1

LOCAL GOVERNMENT AREA: Crows Nest Shire

LOCATION:
The resource is located northeast of the village of Ravensbourne off the Esk-Hampton Road (see map KRA 1).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The sand resource comprises weathered soft, friable sandstone that underlies basalt lavas to the northeast of Ravensbourne. Clay washed from the sand forms a valuable by-product, being sold for brick-making clay. The clay is held under a mining lease.

The resource has been worked for more than 20 years and a sizeable quarry is currently active. Additional resources are likely to occur within the mining lease boundary.

SIGNIFICANCE:
The large resource is sufficient for many years and is well placed to supply Toowoomba and the northeastern Darling Downs, which are otherwise deficient in sources of construction sand. Because of the scarcity of natural construction sand for Toowoomba and the Darling Downs, the Ravensbourne resource is conveniently situated to supply these markets.

SEPARATION AREA:
On the southern and eastern sides the separation distance is the full 200 metres from the property boundary, rather than the resource, as eventual working of the resource may approach this boundary. To the west and north, the boundary is the mining lease boundary, as sufficient separation from eventual workings is likely to be available inside this line.

TRANSPORT ROUTE:
The sand is transported a short distance along Philp Road to the main Esk-Hampton Road.

INGLEWOOD KEY RESOURCE AREA – KRA 2

LOCAL GOVERNMENT AREA: Inglewood Shire

LOCATION:
The resource is located about 10 kilometres east of Inglewood via the Cunningham Highway (see map KRA 2**).**

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of a basalt plug, intruded through older sedimentary rocks. It forms a flat-topped hill with gentle outer slopes.

A quarry supplying various rock products is located at the eastern end of the hill.

SIGNIFICANCE:
The life of the available resource is expected to be over 50 years at the present rate of production. The resource has provided the majority of various rock products to the Inglewood and Waggamba Shires and to townships and road works further west, such as St George. Some products have been transported into New South Wales.

SEPARATION AREA:
The outermost slopes of the basalt hill are weathered and thus unsuitable for extraction. Thus any future development will tend to be confined to the slightly weathered or fresh basalt in the middle part of the hill, with the outer slopes being retained to screen the operations from the surrounding land.

Therefore the separation distance is set at 500 metres from the outermost edge of the basalt resource.

TRANSPORT ROUTE:
A transport route constructed across private property extends westwards around the southern flank of the hill, then along the boundary with the adjacent property and onto the Cunningham Highway to the south.

WELLCAMP DOWNS KEY RESOURCE AREA – KRA 3

LOCAL GOVERNMENT AREA: Jondaryan Shire

LOCATION:
The resource is located south of the Cecil Plains Road about 12 kilometres west of Toowoomba (see map KRA 3).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource consists of hard basalt from a thick volcanic flow or plug, which forms a prominent hill at Wellcamp Downs beside the Cecil Plains Road. The reserves are very large with only minor variations in quality. Resources are believed to be sufficient for over 100 years at present production rates.

The resource is the site of the largest quarry in the region, which supplies a wide range of crushed rock products.

SIGNIFICANCE:
The size of the resource, the proximity to proposed major road and rail transport routes, the ability to work the resource unobtrusively and its location in a broad acre rural area zoned for future industry all make this the most important known rock resource for the eastern Darling Downs region. The resource is conveniently situated to supply the Toowoomba and eastern Darling Downs markets.

SEPARATION AREA:
Although the quarry is currently located in the centre of the hill, in the longer term it could extend further into the outer slopes of the hill.

Accordingly, the separation distance is set at 1000 metres from the outer extent of the resource to protect its long-term availability. The separation area thus extends north of the Toowoomba-Cecil Plains Road.

TRANSPORT ROUTE:
Materials are transported directly onto the Toowoomba-Cecil Plains Road, mainly to the east.

GLENVALE KEY RESOURCE AREA – KRA 4

LOCAL GOVERNMENT AREA: Jondaryan Shire and Toowoomba City

LOCATION:
The resource is located about 6 kilometres southwest of Toowoomba (see map KRA 4).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource comprises hard basalt that forms part of Glenvale Mountain.

It is the site of a major quarry supplying a wide range of crushed rock products.

SIGNIFICANCE:
The resource is understood to be sufficient for 25 to 30 years supply of material at current levels of extraction. The resource is conveniently situated to supply the Toowoomba urban area and the eastern Darling Downs markets.

SEPARATION AREA:
On the eastern and southeastern sides of the hill where the face and processing area are visible, the full 1000 metres separation distance is adopted. On the southern and southwestern sides, the distance is reduced progressively to 500 metres, as the rim of forested land at the base of the hill will screen the adjacent land.

On the northwestern side, the boundary is constrained by the rural residential area adjacent to Riethmuller Road. To the northeast, the boundary follows the base of the hill and down a small ridge to the east to run beside a new subdivision off Boundary Street and then progressively reaches the 1000 metres distance further east and south.

TRANSPORT ROUTE:
The transport route to the east is along Euston Road to the Gore Highway (Anzac Avenue), and westwards along Drayton-Wellcamp Road to the Toowoomba-Cecil Plains Road.

MALU KEY RESOURCE AREA – KRA 5

LOCAL GOVERNMENT AREA: Rosalie Shire

LOCATION:
The resource is located north of Malu railway siding west of Jondaryan (see map KRA 5).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
Fresh basalt occurs beneath shallow overburden at the base of a hill west of Jondaryan, adjacent to the Malu railway siding and grain-loading silos. The available resource is located in a railway reserve originally intended for rail ballast. It is reported that basalt extends for some distance along the ridge to the north.

A small quarry is located immediately north of the grain silos, supplying concrete aggregate, bitumen and sealing aggregates, road base and ballast.

SIGNIFICANCE:
The resource is an important source of quarry rock for the northeastern and western Darling Downs. Large volumes, estimated to be around 20 years supply, exist around the quarry and potentially in areas to the north.

SEPARATION AREA:
A separation distance of 1000 metres around the resource has been adopted because of the flat open nature of the surrounding topography.

TRANSPORT ROUTE:
The rock is transported directly from the site onto the Warrego Highway, or in the case of ballast, loaded at the rail siding near the quarry.

JIMBOUR KEY RESOURCE AREA – KRA 6

LOCAL GOVERNMENT AREA: Wambo Shire

LOCATION:
The resource is located about 30 kilometres north of Dalby along the Jimbour Quarry Road, between Jimbour and Bell (see map KRA 6).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of a slightly weathered basalt flow that overlies sedimentary rocks. This forms an extensive gently sloping ridge.

The Wambo Shire quarry is located in the lowest part of the ridge on the northern side within a Council quarry reserve, and supplies various rock products.

SIGNIFICANCE:
The resource life within the Council reserve is expected to be over 25 years and additional basalt is present in adjacent areas. The resource provides a large percentage of various rock products to the Wambo, Chinchilla, Kingaroy, Nanango and Murilla Shires, Dalby Town Council and at times, material has been sold to other areas as far away as Taroom, Roma and Toowoomba.

SEPARATION AREA:
The separation distance is mostly set at the full 1000 metres from the edge of the Council reserve, except to the north of Jimbour Quarry Road, where the boundary can be set at the crest of the ridge. A separation distance of 1000 metres extends to the eastern end of the ridge where a house is situated.

It is likely that future quarrying would extend southwards from the present Council reserve. Thus the southern limit is set near the crest of the ridge to the south, more than 1000 metres from the southern edge of the Council reserve in order that the quarry remains screened from the lower country to the south.

TRANSPORT ROUTE:
Materials are transported along the Jimbour Quarry Road and then westward to the Dalby-Jandowae Road. Some material is transported eastward to the Bunya Highway.

BRAESIDE KEY RESOURCE AREA – KRA 7

LOCAL GOVERNMENT AREA: Warwick Shire

LOCATION:
The resource is located 22 kilometres south of Warwick on the New England Highway (see map KRA 7).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The hardrock resource comprises hornfels (contact metamorphic rock) developed adjacent to a granitic intuition. Weathering of the granitic rock has produced decomposed granite and boulders which also form part of the resource.

An existing quarry supplies a range of crushed rock products and an adjacent part of the resource has also been approved for extraction.

SIGNIFICANCE:
There are resources sufficient for 50 years supply at the current rate of production. The potential resource in surrounding properties may be much larger.

The resource is conveniently situated to supply the Warwick and Stanthorpe Shires.

SEPARATION AREA:
The western boundary of the separation area allows a total distance of 1000 metres from any proposed blasting operations within the quarry rock resource. Partial screening of the existing operation is provided by a low hill on the western side of the highway. The northern boundary is 1000 metres north of the existing quarry along the highway, and from there eastwards around the northern extremity of the potential resource. The boundary is 1000 metres from the eastern limit of the extractive resource. The southern boundary is set at 1000 metres south of the proposed operation. Extension into the adjacent property would be possible if the southern end of the ridge is retained as a screen with a 500 metre separation distance.

TRANSPORT ROUTE:
Materials are transported directly onto the New England Highway over a route owned by the existing operator. The approved operation will also transport materials directly to the highway.

SPECIAL CONSIDERATIONS:
A small section of 'endangered' vegetation under the *Vegetation Management Act 1999* occurs at the western end of the extractive licence area. This is to be retained as part of the operational plan to serve as a visual buffer to the New England Highway. 'Of concern' vegetation in the KRA is covered by pre-existing approvals. The KRA also contains areas having State biodiversity significance determined through the Environmental Protection Agency's Biodiversity Planning Assessment.

HARLAXTON KEY RESOURCE AREA – KRA 8

LOCAL GOVERNMENT AREA: Toowoomba City and Gatton Shire

LOCATION:
The resource is sited on the northern fringe of the built-up area of Toowoomba east of the Main railway line and the New England Highway (see map KRA 8).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource comprises a very thick basalt sequence near the edge of the Toowoomba escarpment at Harlaxton on the northern fringes of Toowoomba.

It is the site of a major quarry that yields a wide range of crushed rock products.

SIGNIFICANCE:
There are substantial resources remaining sufficient for some decades. The resource is conveniently situated to supply the Toowoomba, northeastern Darling Downs and Lockyer Valley markets.

SEPARATION AREA:
The separation area is constrained by residential blocks to the south and west, and the edge of existing residential settlement above the railway line on the northwest side. It extends to the top of the ridge running east from the escarpment to the north of the gully at the base of the quarry on the northern side, and the base of the escarpment to the east.

TRANSPORT ROUTE:
Materials are transported a short distance along Munro Street to the New England Highway. A rail siding in the quarry facilitates loading of rail ballast when required.

WONGABEL KEY RESOURCE AREA – KRA 9

LOCAL GOVERNMENT AREA: Atherton Shire

LOCATION:
The resource is located about 9 kilometres south of Atherton, on Wongabel Road, off the Atherton-Herberton Road **(**see map KRA 9).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource, which consists of partly decomposed, coarse-grained granite, is an important source of road base materials for the Atherton Tableland area. At deeper levels some knobs of hard unweathered rock allow production of crushed aggregate.

Two adjacent quarries are currently in operation. One site produces higher-class road base and some crushed rock aggregates from blasting and crushing of relatively fresh granite exposed in the floor of the quarry. The other site mainly produces lower-class road bases, maintenance gravels and fill by ripping of weathered granite.

SIGNIFICANCE:
The resource is one of the main sources of road base for the Atherton Tableland market, supplying several local government areas and the Department of Main Roads, and considerable resources remain for the future. Atherton, Eacham and Mareeba Shire Councils are supplied, with some material transported as far as Cairns.

SEPARATION AREA:
The separation area extends 1000 metres across Wongabel Road from the fresh granite face in Wongabel Quarry, as the land is flat and exposed to the processing area. On the southeast the boundary of the separation area is along a ridge trending southwards from the road at about the same distance. The northwestern boundary is the northern base of the ridge on which the workings of Cattle Camp Quarry are situated (where no blasting is undertaken). The southern boundary is in State Forest on the ridge about 400 metres uphill from these workings.

TRANSPORT ROUTE:
The materials are transported along the partly sealed and partly gravel Wongabel Road either westward to the Atherton-Herberton Road or eastwards to Hemmings Lane and then the Kennedy Highway.

SPECIAL CONSIDERATIONS:
A small area of ‘of concern’ vegetation under the *Vegetation Management Act 1999* occurs on the northwestern edge of the resource area. This is covered by pre-existing approvals.

BARRON RIVER FLATS KEY RESOURCE AREA – KRA 10

LOCAL GOVERNMENT AREA: Cairns City

LOCATION:
The resource occurs in parts of the alluvial flats of the Barron River between Kamerunga and the coastline in the northern suburbs of Cairns (see map KRA 10).

EXTRACTIVE RESOURCE: Medium to Coarse Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource comprises three sections of the alluvial flats of the Barron River downstream of its exit from the Barron Gorge. These are underlain by medium to coarse sand with some gravel that occurs beneath the sand. The sand is suitable for concrete aggregate, bedding sand and fill sand. As no comprehensive survey of potential resources in the surrounding flats has been undertaken, the three parts of the Key Resource Area do not represent all possible occurrences of sand in the area and others may be delineated in the future.

Three sand pits are active in the resource at present, supplying sand for concrete, asphalt, bedding and fill uses.

SIGNIFICANCE:
The resource in the Barron River flats is one of only three sources conveniently located to supply the needs of the Cairns regional market for natural medium to coarse concrete and asphalt sand, as well as being a prime source for bedding and fill sand for the same market. Very large resources remain.

SEPARATION AREA:
The boundaries of the sand resources are indicative only, being based on the approximate extent of the existing operations. A maximum separation distance of 200 metres has been adopted around each operation area except where residential boundaries are closer.

TRANSPORT ROUTE:
The sand from the two southern pits is transported directly onto the Brinsmead-Kamerunga Road, and the Captain Cook Highway. Material from the northern resource is transported onto the Yorkeys Knob Road to the Captain Cook Highway.

SPECIAL CONSIDERATIONS:
The boundary of the resource/processing area reflects a minimum buffer width of 50 metres from the Barron River to protect fish habitats. A small area of 'endangered' vegetation under the *Vegetation Management Act 1999* is surrounded by the resource/processing area and is protected by the conditions of the extraction licence. The presence of acid sulfate soils is possible at depth.

MOUNTAINVIEW KEY RESOURCE AREA – KRA 11

LOCAL GOVERNMENT AREA: Cairns City

LOCATION:
The resource is located in the Mulgrave River valley about 10 kilometres west of Gordonvale on the Gillies Highway (see map KRA 11).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource consists of a thick basalt flow, which forms gently sloping ridges between the Mulgrave River and the Gillies Highway near the Mountainview Hotel.
The resource has been the site of a major quarry supplying large volumes of concrete aggregate and bitumen screenings (with minor road pavement gravels), making it one of the major producers for the Cairns market. It is currently inactive, but significant resources remain.

SIGNIFICANCE:
The resource is sufficient for at least 20 years at normal production rates, and is strategically situated to supply the broader Cairns market.

SEPARATION AREA:
The southern, western and northwestern boundaries of the Key Resource Area are along the crests of ridges that are higher than the quarry. These boundaries are about 600 metres to 800 metres from the face and processing facilities. The northern boundary is along the edge of the existing residential subdivision and thence down Roos Creek to the river, at about 800 metres from the face. The Mulgrave River forms the boundary on the east.

TRANSPORT ROUTE:
Rock is transported directly onto the Gillies Highway on the southwestern side of the resource.

SPECIAL CONSIDERATIONS:
The Key Resource Area is adjacent to Little Mulgrave Forest Reserve on the western and southern boundaries. A small area of 'endangered' vegetation under the *Vegetation Management Act 1999* occurs between the western edge of the resource/processing area and the Gillies Highway.

REDLYNCH KEY RESOURCE AREA – KRA 12

LOCAL GOVERNMENT AREA: Cairns City

LOCATION:
The resource is located in Freshwater Creek valley about 5 kilometres south of Redlynch in the western suburbs of Cairns (see map KRA 12).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of dark, fine-grained granite, which outcrops on a major northwest trending ridge on the western side of the Freshwater Creek valley. The rock is more massive and of a higher strength that other sources in the district, and is thus capable of supplying specialist products as well as armour stone.

The resource is the site of a major quarry suppling concrete aggregates, sealing aggregates and manufactured sands.

SIGNIFICANCE:
The resource life is estimated in the order of 30 years at present rates of consumption. The Redlynch resource is one of three major rock deposits currently supplying the Cairns regional market, with material being supplied as far as Mossman and Port Douglas. The resource is close to major regional markets.

SEPARATION AREA:
The separation distance adopted has been constrained by existing subdivisions and conservation areas. The northern boundary is along the southern and western edges of the existing rural residential/urban development to the north of the quarry and thus provides 250 metres to 600 metres of separation. To the south, the boundary is on the ridge crest south of Currunda Creek, thus encompassing the land exposed to direct view and noise from the quarry face and plant site. The eastern boundary is the Redlynch Intake Road. Where the steep and dissected slopes in the State Forest/World Heritage Area provide a physical buffer to the west they form the boundary of the separation area, with a maximum separation distance of 1000 metres directly to the west along a deep gully.

TRANSPORT ROUTE:
The materials are transported from the property onto the Redlynch Intake Road.

SPECIAL CONSIDERATIONS:
The Key Resource Area is adjacent to the Dinden Forest Reserve and the southeastern corner of Barron Gorge National Park is less than one kilometre to the northwest. These areas are essential habitat for cassowaries.

WRIGHT CREEK KEY RESOURCE AREA – KRA 13

LOCAL GOVERNMENT AREA: Cairns City

LOCATION:
The resource is located in the headwaters of Wright Creek about 6 kilometres south of Edmonton (see Map KRA 13).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource consists of two occurrences of interbedded greywacke and argillite. The greywacke has been considerably sheared, giving a tendency to flaky aggregates, and the depth of weathering is considerable. The resource is valuable particularly for road base.

Two large quarries have been established on the resource and are worked as one operation, supplying road base and screening products.

SIGNIFICANCE:
The remaining resource, estimated to be sufficient for about 15 years, is limited by a State Forest boundary to the south and general steepness of terrain. The resource supplies a large proportion of the road base and screenings for the Cairns regional market, being one of three current operations to do so. Materials are transported as far as Mossman, Port Douglas and Malanda on the Atherton Tableland.

SEPARATION AREA:
The northern boundary is 1000 metres from the Mount Peter quarry face, as the open flat land there is exposed to the operations. The eastern boundary is at the foot of the ridge to the east of the face. The northwestern boundary is along a ridge crest about 1000 metres north from the Hussey Road quarry face. The steep slopes in the State Forest/World Heritage Area form the southern and western boundaries.

TRANSPORT ROUTE:
Transport is via the sealed Hussey and Maitland Roads to the Bruce Highway south of Edmonton.

SPECIAL CONSIDERATIONS:
The Key Resource Area is adjacent to Little Mulgrave Forest Reserve. Some 'of concern' vegetation under the *Vegetation Management Act* 1999 is adjacent to the resource/processing area.

RAVENSHOE KEY RESOURCE AREA – KRA 14

LOCAL GOVERNMENT AREA: Herberton Shire

LOCATION:
The resource is located about 1.5 kilometres north of the town of Ravenshoe **(**see map KRA 14).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of rhyolitic welded tuff forming a ridge immediately to the north of the town of Ravenshoe.

The resource is the site of a large quarry, which produces a range of products, including concrete and bitumen sealing aggregates, road bases of various classes and manufactured sand.

SIGNIFICANCE:
The resource remaining on the ridge is very large and is one of the main sources of supply for the southern Atherton Tableland, Normanton and Greenvale markets, as well as extensive rural areas to the south and east for which it is the only developed source of higher class materials.

SEPARATION AREA:
The southern boundary is the northern extent of the residential zone of Ravenshoe town providing a separation distance of 200 metres to 500 metres, extending eastward along the course of North Creek at about a distance of 700 metres from the operations on the ridge crest. The western boundary is the tourist railway line west of Tumoulin Road, which is about 500 metres from the lowest face. The northern boundary is in the State Forest at about 1000 metres from the workings, which are more exposed from this direction.

TRANSPORT ROUTE:
The rock materials are transported down the ridge to Grigg Street, along Moore Street through Ravenshoe and onto the Kennedy Highway on the eastern outskirts of town.

SPECIAL CONSIDERATIONS:
The Key Resource Area is adjacent to the Tumoulin State Forest. The resource/processing area is partly covered by 'of concern' vegetation under the *Vegetation Management Act 1999*, and is classified as 'Endangered' Regional Ecosystem by the Environmental Protection Agency. However, the quarrying operation has 'as-of-right' use that predates the *Integrated Planning Act 1997* and the *Vegetation Management Act 1999.*

COORUMBA ROAD KEY RESOURCE AREA – KRA 15

LOCAL GOVERNMENT AREA: Johnstone Shire

LOCATION:
The resource is located about 9 kilometres west of Innisfail, off the Palmerston Highway (see map KRA 15).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises basalt, which occurs as a single lava flow that outcrops between Berner and Fisher Creeks and the North Johnstone River at Coorumba west of Innisfail.

The resource is the site of a major quarry, which supplies large quantities of railway and tramway ballast, road base, and some concrete and sealing aggregates.

SIGNIFICANCE:
There are very large volumes remaining in the resource and it is conveniently situated to supply the Innisfail and surrounding districts with a range of crushed rock products, being one of only two current sources capable of doing so.

SEPARATION AREA:
On the northeast and southwest the separation distance of about 800 metres to 900 metres from the faces and crushing plant extends just beyond gentle ridge crests that overlook the valley of Berner Creek where the quarry is situated. This screens the operations from surrounding land in that direction. On the northwest the boundary is a full 1000 metres from the advancing new face, as the land there is flat and will not be shielded from noise impacts.

TRANSPORT ROUTE:
The rock materials are transported via the partly unsealed and sealed Coorumba Road to the Palmerston Highway.

SPECIAL CONSIDERATIONS:
The northern section of the separation area in the KRA encompasses possible essential cassowary habitat.

PIN GIN HILL KEY RESOURCE AREA – KRA 16

LOCAL GOVERNMENT AREA: Johnstone Shire

LOCATION:
The resource is located about 6 kilometres west of Innisfail, off the Palmerston Highway (see map KRA 16).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of basalt, which occurs beneath about 3 metres of red soil in hills south of the Palmerston Highway west of Innisfail.

The resource is the site of a large quarry operated for several decades by the Johnstone Shire Council (the Palmerston Quarry) but which is now leased to a private company. Concrete and bitumen aggregates and road base are produced.

SIGNIFICANCE:
The resource remaining is very large, sufficient for several decades at the present rate of production. It is one of only two currently known sources capable of supplying a range of high quality crushed products and is of strategic significance to the Innisfail district and areas to the north as far as Babinda in Cairns City and Tully in Cardwell Shire.

SEPARATION AREA:
On the west, south and southeast the separation area boundary adopted is just beyond the gentle ridge crests of the land rising above the quarry. The separation distance thus varies from about 500 to 800 metres from the resource boundary. On the northeast the distance is at a full 1000 metres as this land is lower and exposed to future operations on the resource. On the north, the boundary is North Bamboo Creek, where it crosses Quarry Road, as this lies along a ridge screening the surrounding land from quarry operations.

TRANSPORT ROUTE:
The materials are transported a short distance along the sealed Quarry Road to the Palmerston Highway.

SPECIAL CONSIDERATIONS:
The northwestern section of the separation area in the KRA encompasses possible essential cassowary habitat.

TICHUM CREEK KEY RESOURCE AREA – KRA 17

LOCAL GOVERNMENT AREA: Mareeba Shire

LOCATION:
The resource is located adjacent to the Kennedy Highway between Mareeba and Kuranda (see map KRA 17).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of a number of flows of basalt beside the Kennedy Highway at Tichum Creek.

It is the site of a major quarry which has been active for over 20 years producing road base and crushed aggregates. More recently manufactured sand has also been produced.

SIGNIFICANCE:
The remaining resource is probably sufficient for another 15 years at the current rate of production. The resource supplies considerable quantities of road base and screenings to the Cairns market, being one of the three main quarries to do so, and is one of the main sources of crushed screenings and road base for the Atherton Tableland market.

SEPARATION AREA:
The resource is situated in a ridge south of the Davies Creek valley, adjacent to the junction with Tichum Creek. The level land to the west and southwest requires the full separation distance of 1000 metres, whereas the boundary of the separation area is set at the foot of the steep slopes to the north, east and south. This distance varies from 500 metres near the Kennedy Highway north and south of the resource, to 1000 metres along the northeastern side of Davies Creek.

TRANSPORT ROUTE:
The materials are transported directly onto the Kennedy Highway.

SPECIAL CONSIDERATIONS:
The KRA is adjacent to the Dinden State Forest to the east.

BENEDICT ROAD KEY RESOURCE AREA – KRA 18

LOCAL GOVERNMENT AREA: Fitzroy Shire

LOCATION:
The resource is located about 32 kilometres west of Rockhampton and 7 kilometres north of Stanwell along Benedict Road (see map KRA 18).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of basalt up to 35 metres thick, which overlies conglomeratic sedimentary rocks.

An area east of the junction of Benedict Road and Hopkins road has been included in the resource/processing area.

SIGNIFICANCE:
This resource has the potential to provide aggregate and other construction materials for the proposed expansion of industrial facilities and other development in the eastern part of the central Queensland region. There are additional potential resources in the basalt to the west that have not yet been proven.

SEPARATION AREA:
The boundary is set at 1000 metres from the extent of the resource limits to the north and east where the land is lower than the basalt ridge. On the southeastern, southern and western side the separation distance extends to the crests of ridges, which are higher than the resource.

TRANSPORT ROUTE:
The transport route will extend along Hopkins Road south to the Capricorn Highway.

TARAGOOLA KEY RESOURCE AREA – KRA 19

LOCAL GOVERNMENT AREA: Calliope Shire

LOCATION:
The resource is located 2 kilometres east of Taragoola railway siding, about 12 kilometres south of Calliope (see map KRA 19).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of a north-trending belt of limestone deposits. The resources are quarried for extractive purposes such as concrete aggregate, railway ballast, road base, and general construction work. The limestone is extracted under mining lease tenure under the *Mineral Resources Act 1989* for uses such as acid soil treatment and for lime for the alumina refinery in Gladstone.

SIGNIFICANCE:
The resource is one of only two major sites currently supplying crushed quarry rock to the Gladstone region. The large resources present and the convenient location of the Taragoola resource, close to Gladstone and existing rail infrastructure, means that the resource will remain of significance for the quarry rock needs of the region.

SEPARATION AREA:
The eastern, southern and western boundaries of the separation area are defined by the full supply level of the raised Awoonga dam reservoir.

The northern boundary is located about 500 metres north of the northern-most mining lease, where an intervening ridge provides partial shielding from quarry impacts. The northwestern boundary is retained at the full 1000 metres from the resource/processing area.

TRANSPORT ROUTE:
The materials are either transported to the Taragoola rail siding along a private road, or along a rural road to the Dawson Highway at Calliope. The first 3 kilometres of this road is unsealed.

SPECIAL CONSIDERATIONS:
There are a number of indigenous cultural heritage sites recorded within the separation area, and two recorded sites within the resource/processing area. Both these sites were recorded during the Stage 1 survey of the Awoonga Dam Raising Cultural Heritage Project and are now protected under the *Aboriginal Cultural Heritage Act 2003*. Despite the level of disturbance within the Taragoola mining area, there is further potential for archaeological sites to exist. The limestone supports vegetation that is significant to the Traditional Owners, and the possibility that surface and subterranean rock art exists in this area has not yet been fully explored. If such sites were identified, they would be unique in the region. Further development in this KRA should be subject to appropriate management of the cultural heritage sites and values, in consultation with the Traditional Owners (Port Curtis/Coral Coast Native Title Claim Group), through a Cultural Heritage Management Plan.

YARWUN KEY RESOURCE AREA – KRA 20

LOCAL GOVERNMENT AREA: Calliope Shire

LOCATION:
The resource is located about 1 kilometre west of the township of Yarwun south of the Gladstone-Mount Larcom Road and the North Coast railway line (see map KRA 20).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of hardened sedimentary rocks adjacent to the railway line west of Yarwun.

An operating quarry supplies a full range of crushed rock products, including road base, concrete aggregate, bitumen screenings, rail ballast, drainage aggregate and crusher dust.

SIGNIFICANCE:
The resource is one of only two major sites currently supplying crushed quarry rock to the Gladstone region. Sizeable resources are present. The convenient location of the resource to Gladstone and the available range of products make it of strategic significance to the development of Gladstone and the surrounding district.

SEPARATION AREA:
The resource could extend to the crest of the ridge west of Yarwun. The boundary of the separation area extends to the eastern base of this ridge southwest of the town of Yarwun. At the northern end of the town, the boundary is sited somewhat higher up the ridge. On the western side the area extends to the western base of the next ridge west of the resource area. This allows a separation distance of over 500 metres to be maintained around the southern half of the resource.

The northern boundary is 1000 metres away from the quarry face due to the lower topography there. This encompasses some land on the northern side of the Gladstone State Development Area corridor. The separation area includes the old railway quarry but would have to be extended if this were to be reopened.

TRANSPORT ROUTE:
The materials are transported along Quarry Road westward from the quarry to the junction with the Mount Larcom-Gladstone Road. Ballast for railway contracts is loaded at a siding adjacent to the quarry.

SPECIAL CONSIDERATIONS:
'Endangered' vegetation under the *Vegetation Management Act 1999* occurs over part of the resource/processing area, however this is covered by a pre-existing approval for extractive industry.

NERIMBERA KEY RESOURCE AREA – KRA 21

LOCAL GOVERNMENT AREA: Livingstone Shire

LOCATION:
The resource is located in the foothills of the Berserker Range about 8 kilometres east of Rockhampton, north of the Emu Park Road (see map KRA 21).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of hardened argillite and greywacke in the foothills of the Berserker Range to the east of Rockhampton.

The northern part of the resource is the site of a major quarry supplying a full range of crushed rock products. The plant and stockpile area is sited on land on the west side of Black Creek. There are plans for this operation to be superseded in future years by a new quarry on the southern part of the resource, with a processing plant adjacent to the Emu Park-Rockhampton Road.

SIGNIFICANCE:
The available resource is very large and is the prime source of high quality crushed rock products for the Rockhampton and wider central Queensland region. The volume of material present will enable continuity of this supply for the long term.

SEPARATION AREA:
The northern boundary is set at the full 1000 metres away from the existing quarry face because of the exposure of this area to the face. The separation area extends to ridgelines where possible, either their crests or base. It extends down the crest of the ridge to the east of Scholl Lane to Nerimbera School Road, and then continues across Black Creek to the base of the main north-south ridge in the vicinity of Stover Road and Black Creek Road. The southern boundary is the base of the ridge along Black Creek Road about 500 metres from the proposed quarry development. To the southeast the separation distance is the greater of 1000 metres from the proposed resource area or 500 metres from the bund screening the proposed processing area adjacent to Emu Park Road. The eastern boundary largely follows the base or crests of ridges where possible.

TRANSPORT ROUTE:
The rock materials are transported from the present operation along the Nerimbera School Road to Emu Park Road. Rail ballast is loaded at the Nerimbera rail siding on the Yeppoon Branch Line. The proposed quarry operation on the southern side of the ridge will access the Emu Park-Rockhampton Road directly.

SPECIAL CONSIDERATIONS:
A small area of 'of concern' vegetation under the *Vegetation Management Act 1999* occurs near the stockpile areas within the resource/processing area. There is also unconfirmed evidence that the KRA contains *Cycas opheiolitica,* which is listed as 'endangered' under the *Nature Conservation Act 1992.*

PINK LILY KEY RESOURCE AREA – KRA 22

LOCAL GOVERNMENT AREA: Fitzroy and Livingstone Shires

LOCATION:
The resource is located on the banks of the Fitzroy River about 8 kilometres west of Rockhampton off the Ridgelands Road (see map KRA 22).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of fine to coarse-grained sand and gravel in off-stream deposits in the Pink Lily and Lilymere Lagoons areas just west of Rockhampton.

Sand is pumped to a processing plant on the bank of the river at the end of Pink Lily Road from a dredging operation in the Fitzroy River at Pink Lily Bend. Farther to the west, sand has also been produced from pits in the lower alluvial terrace of the river near Lilymere Lagoon for use as bricklayers loam, binder and bedding sand. Sand is also worked intermittently from large deposits on terraces adjacent to the river on its north side about three and a half kilometres southwest of its junction with Ramsay Creek.

SIGNIFICANCE:
These resources are the major source of fine concrete aggregate and other construction sands for the Rockhampton region and may in the future need to supply other more distant markets such as Gladstone and Mackay.

SEPARATION AREA:
The separation area boundary is set at the full 200 metres from the boundary of the off-stream resource. It also extends 200 metres from existing or proposed processing plants.

TRANSPORT ROUTE:
Sand is transported by road from the unsealed Pink Lily Road to Ridgelands Road. Sand from deposits on the northern side of the river is transported from private land directly onto Belmont Road and then either directly to processing plants or to the Bruce Highway via major local roads.

SPECIAL CONSIDERATIONS:
As the KRA is adjacent to the Fitzroy River, which contains valuable fisheries resources in this location, a minimum buffer width of 50 metres has been established from the resource/processing area to the river. The KRA contains areas having State biodiversity significance determined through the Environmental Protection Agency's Biodiversity Planning Assessment.

THE CEDARS KEY RESOURCE AREA – KRA 23

LOCAL GOVERNMENT AREA: Mackay City

LOCATION:
The resource is located about 8 kilometres northwest of Mackay (see map KRA 23).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises granitic rocks, mainly diorite and granodiorite. Large inclusions and irregular dykes of microdiorite are common and dykes of dolerite occur to a lesser extent.

It is the site of a major quarry supplying a wide range of crushed rock products.

SIGNIFICANCE:
The resource remaining in the existing quarry and immediately surrounding land is substantial and estimated to be sufficient for more than 25 years supply. The resource is conveniently situated to continue to supply the Mackay urban area and surrounding districts.

SEPARATION AREA:
Because the quarry has only low relief, the full 1000 metres separation distance from the quarry has been adopted. To the southwest of the quarry, the separation distance is constrained by a pre-existing subdivision.

TRANSPORT ROUTE:
The transport route extends along Holts Road either northwards to the Mackay-Habana Road or southwards to connect to the Bruce Highway via Glendaragh Road or eastwards to the Mackay-Bucasia Road.

FARLEIGH KEY RESOURCE AREA – KRA 24

LOCAL GOVERNMENT AREA: Mackay City

LOCATION:
The resource is located on the western side of The Black Mountain, 13 kilometres northwest of Mackay (see map KRA 24).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises rocks of basaltic-andesite composition with dykes of microdiorite throughout, which are part of an unnamed Mesozoic intrusive complex that forms The Black Mountain and outcrops in the surrounding area.

It is the site of a major quarry supplying a wide range of crushed rock products.

SIGNIFICANCE:
The resource remaining in the existing quarry and immediately surrounding land is substantial and estimated to be in excess of 50 years supply. The resource is conveniently situated to continue to supply the Mackay urban area and surrounding district.

SEPARATION AREA:
On the western and southern sides of the quarry area where the face and operations are visible, the full 1000 metres separation distance is adopted. On the eastern side, the summit of the mountain will be retained to screen the quarry, and steep heavily forested land in that direction provides a separation distance of about 1000 metres. On the northern side, the distance is reduced slightly as steep spurs extending down from the summit of the mountain will screen the land to the north.

TRANSPORT ROUTE:
The materials are transported along Habana-Farleigh Road to the Bruce Highway.

HATFIELD KEY RESOURCE AREA – KRA 25

LOCAL GOVERNMENT AREA: Sarina Shire

LOCATION:
The resource is located about 25 kilometres south southwest of Sarina (see map KRA 25).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises hard volcanic rocks, mainly andesitic tuff and dacitic lithic crystal tuff.

It is the site of a major quarry supplying mainly rail ballast for maintenance and new construction work on lines connecting the coalfields and coal loading ports as well as the main North Coast railway.

SIGNIFICANCE:
The resource remaining in the existing quarry and immediately surrounding land is substantial and estimated to be in excess of 25 years supply. The resource is conveniently situated to supply rail ballast for both maintenance and future construction work in the area.

SEPARATION AREA:
The full 1000 metre separation distance from the face and quarry infrastructure as well as potential resources to the north is adopted.

TRANSPORT ROUTE:
The majority of rock is loaded directly onto rail transport using a spur line from the Goonyella-Hay Point railway. Some rock could be transported directly onto the Koumala-Bolingbroke Road to the Bruce Highway to the east if permitted by the Mains Road Department, or west to the Sarina Road if required

FOXDALE KEY RESOURCE AREA – KRA 26

LOCAL GOVERNMENT AREA: Whitsunday Shire

LOCATION:
The resource is located about 4 kilometres north of Proserpine (see map KRA 26).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises andesite.

It is the site of a major quarry supplying a wide range of crushed rock products.

SIGNIFICANCE:
The resource remaining in the existing quarry and immediately surrounding land is substantial and estimated to be in excess of 20 years supply. The resource is conveniently situated to supply the Proserpine and Whitsunday regional areas.

SEPARATION AREA:
The full 1000 metre separation distance from the face and processing area is adopted. A lesser separation distance could be considered on the northern and northeastern sides of the hill because at present the crest of the hill buffers the quarry from any potential noise and dust and it is not be visible from those directions. However, the potential for development of potential resources in that direction exists, so a lesser distance is not used.

TRANSPORT ROUTE:
The transport route extends along Quarry Road to the Bruce Highway.

SPECIAL CONSIDERATIONS:
A small area of 'of concern' vegetation under the *Vegetation Management Act 1999* lies within the Council reserve and is likely to be protected by the conditions of the operational plan. It is also partly protected by a buffer around a communication tower on top of the hill.

NORTH GREGORY KEY RESOURCE AREA – KRA 27

LOCAL GOVERNMENT AREA: Whitsunday Shire

LOCATION:
The resource is located about 14 kilometres north northeast of Proserpine (see map KRA 27).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises volcanic rock (dacite).

It is the site of a moderate sized quarry supplying a wide range of crushed rock products.

SIGNIFICANCE:
The resource remaining in the existing quarry and immediately surrounding land is substantial and estimated to be in excess of 20 years supply. The resource is conveniently situated to supply the Proserpine and surrounding Whitsunday area.

SEPARATION AREA:
The full 1000 metre separation distance from the resource and processing area is adopted to avoid encroachment from any potential closer settlement or intensification of rural activities, or potential developments associated with eco-tourism in nearby protected areas and reserve land.

TRANSPORT ROUTE:
Materials are transported along Patullo Road to the Gregory – Cannon Valley Road, then either west to the Bruce Highway or east to the Proserpine-Shute Harbour Road.

SPECIAL CONSIDERATIONS:
The KRA contains areas having State biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment. These are in areas of 'not of concern' vegetation under the *Vegetation Management Act 1999* and are classified as 'Endangered' Regional Ecosystem by the Environmental Protection Agency.

THE ROCKS KEY RESOURCE AREA – KRA 28

LOCAL GOVERNMENT AREA: Burdekin Shire

LOCATION:
The resource is located about 14 kilometres southwest of Home Hill (see map KRA 28).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises granitic rocks, mainly adamellite.

It is the site of a major quarry supplying a wide range of crushed rock products.

SIGNIFICANCE:
The resource remaining in the existing quarry and immediately surrounding land is substantial and estimated to be in excess of 25 years supply. The resource is conveniently situated to supply the Ayr-Home Hill area and surrounding districts.

SEPARATION AREA:
To the north, east and west the full 1000 metre separation distance is adopted to protect the resource from future subdivision, as the surrounding land is lower than the resource itself. On the southern side, the Burdekin River bed and banks are included in the 1000 metre separation distance to avoid any likely impacts from possible future development either within the river itself or in the southern riparian zone.

TRANSPORT ROUTE:
The rock is transported directly onto the Ayr – Dalbeg Road.

MOUNT CORDELIA KEY RESOURCE AREA – KRA 29

LOCAL GOVERNMENT AREA: Hinchinbrook Shire

LOCATION:
The resource is located at Mount Cordelia about 10 kilometres northeast of Ingham (see map KRA 29).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of very hard volcanic rock (rhyolitic welded tuff) on the lower northern slopes of Mount Cordelia. It is suitable for a complete range of crushed rock products. The tuff is intruded by fine-grained pink granite that is also suitable for aggregate.

The resource is the site of one large quarry on the western end, and a smaller face of another quarry on the east. The quarries produce road base, crushed aggregates, including railway and tramway ballast, and armour stone for river protection works for the Ingham district, with some armour stone transported further distances.

SIGNIFICANCE:
The large resources remaining are sufficient for at least another 20 years. The resource is of regional significance as the two quarries provide virtually all the demand for crushed rock products in the Ingham district, and some products are supplied to specialised markets further to the north and south.

SEPARATION AREA:
The ridge crest of Mount Cordelia defines the southern separation area boundary. The lower ground to the north of the resource requires the full 1000 metre separation distance.

TRANSPORT ROUTE:
The rock from both quarries is transported eastwards along the sealed Quarry Road and then mainly west to Ingham via the sealed arterial road of Cooks Lane to the Ingham-Forrest Beach Road.

BLACK RIVER KEY RESOURCE AREA – KRA 30

LOCAL GOVERNMENT AREA: Thuringowa City

LOCATION:
The resource is located off the Black River Road south of Yabulu about 27 kilometres west of Townsville (see map KRA 30).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resources comprise volcanic rocks (rhyodacitic and rhyolitic welded tuffs) outcropping in a well-defined ridge extending north of Mount Black, and decomposed granite beneath lower country west of the ridge. Large resources of both volcanic rocks and decomposed granite are present.

The resources are the site of a major rock quarry that supplies road base and some concrete aggregate, and a pit in the decomposed granite that supplies road surfacing and fill materials.

SIGNIFICANCE:
Very large resources are available at the site for the longer term. The resource is one of three major sites supplying the Townsville regional market with road base and crushed aggregates.

SEPARATION AREA:
The separation distance on the north northwest and west sides is the full 1000 metres from the hard rock portion of the resource. The separation distance on the eastern side is about 750 metres as there is an intervening line of ridges. On the southern side the boundary of the separation distance is at the toe of the very steep northern slopes of Mount Black.

TRANSPORT ROUTE:
The rock is transported along a sealed road in a quarry-owned corridor to the east and then along the sealed Gieseman Road to Black River Road, continuing north to the Bruce Highway.

BOHLE KEY RESOURCE AREA – KRA 31

LOCAL GOVERNMENT AREA: Thuringowa City

LOCATION:
The resource is located on the Bruce Highway about 12 kilometres west of Townsville (see map KRA 31).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises rhyolitic (volcanic) rocks that formed the original Mount Bohle and occur in a line of hills extending to the northwest.

It is the site of a major quarry that has been deepened below natural surface level and supplies a wide range of crushed rock products.

SIGNIFICANCE:
There are substantial resources remaining in the existing quarry and immediately surrounding land, in excess of 15 years supply. The resource is conveniently situated to supply the Townsville regional area.

SEPARATION AREA:
On the east the separation area boundary is along the Bohle River. On the south and southwest, the separation distance is the full 1000 metre distance from the resource boundary. On the west, the boundary is the crest of a major side spur running in a westerly direction from the line of hills; thus screening future extensions of the quarry in this direction.

On the northwestern side the separation area boundary is along the edge of the residential blocks along Bradford Street. On the northern side the boundary extends along the edge of the buffer between the railway and designated residential developments to the north of the railway.

TRANSPORT ROUTE:
The rock is transported directly onto the Bruce Highway, or in the case of rail ballast to an adjacent siding on the North Coast Railway.

PINNACLES KEY RESOURCE AREA – KRA 32

LOCAL GOVERNMENT AREA: Thuringowa City

LOCATION:
The resource is located southwest of Townsville about 8 kilometres west of Kelso and 7 kilometres south of the Hervey Range Road (see map KRA 32).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of volcanic rock (rhyolitic welded tuff) on ridges running off mountains to the west of the Upper Ross River Road. These rocks are suitable for a range of aggregate products. Resources of pink microgranite, with a wide fracture spacing that makes it suitable for the production of armour rock in addition to very high strength concrete aggregate, are also present.

The resource is currently the site of a small quarry that may expand in the future.

SIGNIFICANCE:
Although the present quarry is only a small operation, the resource itself is significant for the longer term because of its isolation from settlement, unhindered transport corridor, and the significant development of the resource undertaken to date. The microgranite also provides a resource of unfractured armour stone and high strength aggregate not readily available from other resources close to Townsville.

SEPARATION AREA:
Because of the exposure of the quarry faces to the north and northwest, the boundary on this side is the full distance of 1000 metres from the faces. This encompasses mainly land owned by the quarry, but also extends over some State leasehold land on the northwest. The boundary on the western side is set at 1000 metres from the extractive resource limit as there are no topographic barriers in that direction. To the southeast the boundary is on the crests of ridges, which overlook the resources and potential long-term operations. To the south and southwest the boundary is set at 500 metres from the extractive resource limit as the steep escarpment of The Pinnacles and South Pinnacle forms a topographic barrier.

TRANSPORT ROUTE:
Rock materials are transported along a private gravel road through rural land northwards to Percival Road and then a short distance to the Hervey Range Road. Only minor amounts are allowed to be transported eastwards to the Upper Ross River Road.

WAITARA KEY RESOURCE AREA – KRA 33

LOCAL GOVERNMENT AREA: Nebo Shire

LOCATION:
The resource is located about 12 kilometres south of Nebo and 3 kilometres north of the Waitara siding on the Goonyella-Hay Point railway (see map KRA 33).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource is within a northerly trending ridge of basaltic andesite capped by rhyolite.

A quarry has been operated on this resource for over 30 years since the construction of the railway.

SIGNIFICANCE:
The resource has the potential to supply the regional demand for at least 20 years. It is located near a major market with established infrastructure (the railway) and the availability of alternative resources is scarce. Currently its principal purpose is to supply ballast for the Goonyella rail network.

SEPARATION AREA:
The separation area boundary is set at the full 1000 metres from the outer limits of the known resource, as the ridge containing the resource is higher than the surrounding land. The boundary has been extended to run along Denison Creek on the southeast side south to the railway line, then along the line to include the Waitara siding, and then parallel to the transport route in a northeasterly direction with a 50 metre setback.

TRANSPORT ROUTE:
Materials are transported to the Waitara railway siding 3 kilometres to the south, where it is loaded onto rail trucks for distribution to the rail network. Minor amounts of materials are transported to the Peak Downs Highway via the Oxford Downs-Sarina Road and Braeside Road.

CAPE CLEVELAND KEY RESOURCE AREA – KRA 34

LOCAL GOVERNMENT AREA: Townsville City

LOCATION:
The resource is located on the Cape Cleveland peninsula about 45 kilometres southeast of Townsville (see map KRA 34).

EXTRACTIVE RESOURCE: Fine Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resource area comprises fine sand in two sections of former beach ridge on the Cape Cleveland peninsula. The sand is used in concrete aggregate. As virtually the whole of the lower part of the Cape Cleveland peninsula is underlain by such sand, the two parts of the Key Resource Area do not represent all possible resources in the area and others may be delineated in the future.

Two sand pits are currently being operated in each section of the Key Resource Area.

SIGNIFICANCE:
Very large volumes of sand are present, sufficient for many decades, and they supply virtually all the region's requirements for this material.

SEPARATION AREA:
Two deposits are outlined, one over largely cleared land north of the northern pit and another over the higher broader sand ridges adjacent to the southern pit, north and south of Goodsells Road. The areas are sufficiently large to provide for adequate separation between sand operations and surrounding land uses. The separation area boundary is set along the nearest property boundary or with a separation distance of the full 200 metres from the edge of the resource.

TRANSPORT ROUTE:
The sand is transported either along the sealed Goodsells and Carty Roads or directly onto Cape Cleveland Road then to the Bruce Highway.

SPECIAL CONSIDERATIONS:
The eastern boundary of the KRA extends along Bowling Green National Park, which is part of an internationally significant RAMSAR wetland. A minimum buffer width of 100 metres has been applied from the resource/processing area to the RAMSAR wetland. The transport route is through the National Park.

Most 'of concern' vegetation under the *Vegetation Management Act 1999* located in the resource processing area is covered by pre-existing approvals.

ROSENEATH EAST KEY RESOURCE AREA – KRA 35

LOCAL GOVERNMENT AREA: Townsville City

LOCATION:
The resource is located about 13 kilometres south of Townsville, east of the Flinders Highway and east of the settlement of Roseneath (see map KRA 35).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The northern part of this resource consists of rhyolitic welded tuff and other volcanic rocks. A major quarry currently operates in this part of the resource. The southern part of the resource consists of similar volcanic rocks on land recently acquired for possible longer term extraction when the northern quarry is exhausted.

The current quarry produces road base, concrete and bitumen aggregates and railway ballast.

SIGNIFICANCE:
Resources are expected to be sufficient for the next 10 years. The northern part of the resource is currently supplying a large proportion of the Townsville regional market for crushed aggregates. The current quarry is one of three major quarries currently supplying crushed aggregates to the Townsville regional market. The southern section has sufficient rock to continue this supply into the longer term.

SEPARATION AREA:
The northwestern boundary is along Stuart Creek, providing a separation of about 900 metres from the existing quarry face and about 200 m from a planned future processing area to the small lots already existing on the western side of the creek. The northern and eastern boundaries lie along crests of ridges within the Prison Reserve to the north and east of the quarry. The boundary continues around the eastern and southern sides of the southern section of the resource at a separation distance of 1000 metres due to the surrounding flat land. The southwestern boundary is on a major ridge crest. The western boundary extends about 1000 metres from the existing quarry (this is within the Explosives Reserve) and the southern resource.

TRANSPORT ROUTE:
Products are transported on a private gravel road along an easement through the Brookhill Explosives Reserve to the Flinders Highway. It is intended that the same route will be used for the southern resource.

ROSENEATH WEST KEY RESOURCE AREA – KRA 36

LOCAL GOVERNMENT AREA: Townsville City

LOCATION:
The resource is located about 13 kilometres south of Townsville, adjacent to and west of the Flinders Highway (see map KRA 36).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource consists of rhyolitic welded tuff and agglomerate intruded by dyke rocks in the hills west of the Flinders Highway opposite the settlement of Roseneath.

In the past the resource has been the site of two large quarries, which produced a range of crushed rock products, and although both of these are now inactive, very large resources remain and the properties are being held in reserve by the companies involved.

SIGNIFICANCE:
The Roseneath West resource contains large quantities of high quality rock. It is strategically situated to supply major markets in the Townsville/Thuringowa region and adjacent markets for the medium to long term.

SEPARATION AREA:
The eastern and northern boundaries of the separation area are along the Flinders Highway and the Mount Stuart Road. The southern boundary is on a ridge crest about 500 metres to the south. The western boundary is on ridge crests within the Commonwealth Department of Defence land. Small future urban blocks along the western side of the Flinders Highway currently lie within the separation area. The status of these is unclear and any rezoning would limit the separation area to their western boundary.

TRANSPORT ROUTE:
The transport route for the KRA follows the access of the previous quarries along Labuan Street directly onto the Flinders Highway.

WEST EURI CREEK KEY RESOURCE AREA – KRA 37

LOCAL GOVERNMENT AREA: Bowen Shire

LOCATION:
The resource is located about 15 kilometres west-southwest of Bowen (see map KRA 37).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource comprises mainly diorite.

It is the site of a major quarry supplying a wide range of crushed rock products.

SIGNIFICANCE:
There are substantial resources remaining in the existing quarry and adjacent land, estimated to be in excess of 25 years supply. The resource is conveniently situated to supply the Bowen regional area.

SEPARATION AREA:
The existing quarry and future resources and processing activities are all located within the one block which is covered by a lease and the extractive permit. A 1000 metre separation distance has been adopted.

TRANSPORT ROUTE:
The rock is transported via West Euri Road, which leads northwards to the Bruce Highway to Bowen and other markets to the north, south, and southwest

BEHANA GORGE ROAD KEY RESOURCE AREA - KRA 38

LOCAL GOVERNMENT AREA: Cairns City

LOCATION: Behana Gorge Road, 6.5 km southeast of Gordonvale near the Bruce Highway and within 30km of the Cairns CBD (See Map KRA 38).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource is situated in fine to medium grained granite which forms a knoll rising 120 metres above surrounding sugarcane land on the flats of Behana Creek.

Portions of the knoll have been previously quarried for decomposed granite.

SIGNIFICANCE:
Drilling and petrographic studies show that the resource has superior material qualities to other hard rock resources in the Cairns region, and has the potential to supply the region for several decades. It is the only remaining large undeveloped resource on the coastal plain within 70 km of Cairns.

SEPARATION AREA:
The northern lot covering most of the granitic knoll is used to depict the resource/processing area. A full separation distance of 1000 metres has been adopted to allow for the low-lying and level country surrounding the resource and the knoll.

TRANSPORT ROUTE:
The proposed transport route exits the resource/processing area on the northern side of the knoll and follows the northern boundary of the lot until it reaches the Behana Gorge Road. It then extends northwards along Behana Gorge Road to the intersection with the Bruce Highway.

FERNY GROVE KEY RESOURCE AREA – KRA 39

LOCAL GOVERNMENT AREA: Brisbane City

LOCATION:
The resource is located approximately one kilometre southwest of the intersection of Samford and Upper Kedron Brook Roads between the suburbs of Ferny Grove and Keperra (see map KRA 39).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of hornfels located at the contact between the Enoggera Granite and the Bunya Phyllite.

A major quarry is located within the resource.

SIGNIFICANCE:
The present resource life is expected to be over twenty years. The Ferny Grove Quarry provides a significant proportion of various rock products to the Brisbane City and Pine Rivers Shire, including bitumen screenings and concrete aggregates. It is conveniently located compared to other major quarries further north in Pine Rivers Shire.

SEPARATION AREA:
The separation area is constrained by residential developments to the east and west, limiting the separation area boundaries to the closest side of the road reserves along O'Quinn Street and Glengarry Road.

The separation distance has been set at 500 metres from the Environmental Protection and Community Use areas of the Brisbane City planning scheme in the south, because the resource is largely shielded by intervening ridges. The northernmost limit is set by the Emerging Communities area north of Upper Kedron Road. The boundary is set at the southern side of Upper Kedron Road south of the Emerging Communities area.

TRANSPORT ROUTE:
The materials are transported onto Upper Kedron Brook Road and then to Samford Road via an uncontrolled intersection.

MAITLAND ROAD KEY RESOURCE AREA – KRA 40

LOCAL GOVERNMENT AREA: Cairns City

LOCATION:
The resource occurs about 5 kilometres northwest of Gordonvale (see map KRA 40).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of greywacke. It is situated at the northern end of a northerly trending ridge. A small quarry has been established in a well-screened situation with ridges surrounding most of the workings.

SIGNIFICANCE:
The resource is on leased freehold land and has reserves estimated to be sufficient for more than 20 years supply. It is adjacent to the Wright Creek KRA 13 and shares the same transport route along to the Bruce Highway north of Gordonvale to the Cairns market.

SEPARATION AREA:
A separation distance of 500 metres has been adopted around the perimeter of the resource as it is largely screened from the surrounding land by topographic barriers. The surrounding land is zoned as Rural.

TRANSPORT ROUTE:
Materials are transported via an unsealed road to Maitland Road and then onto the Bruce Highway near Meringa.

SPECIAL CONSIDERATIONS:
The Key Resource Area is adjacent to the Wet Tropics Management Area. Some Cassowary Essential Habitat has been mapped within the Separation Area along the ridge to the south and along a riparian zone to the west.

KHOLO CREEK KEY RESOURCE AREA – KRA 41

LOCAL GOVERNMENT AREA: Brisbane City

LOCATION:
The resource is located about 4 kilometres north of Mount Crosby (see map KRA 41).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource includes large volumes of andesite and quartz diorite, with subsidiary rhyolite, hornfels and quartzite, occurring in elevated terrain northeast of Mount Crosby.

SIGNIFICANCE:
The resource has not been quantified in detail and the available resource depends on an acceptable quarry design. However it is estimated that several decades of supply would be available. It is the largest resource of quarry rock within Brisbane City and adjacent areas.

SEPARATION AREA:
The full separation distance of 1000 metres has been adopted for the majority of the resource in the southern, western and northern sectors. However, the distance is constrained to less than 500 metres on the northern and southeastern sides by small-lot rural subdivisions that are partly screened by high ridges. A separation distance of 500 metres has been adopted where larger rural subdivisions occur to the east.

TRANSPORT ROUTE:
The transport route from the resource/processing area has been subject to extensive investigations in recent years. The route is shown as a dedicated corridor that will avoid the settled areas of Mount Crosby by heading west then southwest to cross the Brisbane River and lead onto the Warrego Highway.

SPECIAL CONSIDERATIONS:
The KRA contains sizeable areas of 'of concern' vegetation under the *Vegetation Management Act 1999*, areas having regional biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment and encompasses three cultural heritage sites of State significance.

MOUNT COOT-THA KEY RESOURCE AREA – KRA 42

LOCAL GOVERNMENT AREA: Brisbane City

LOCATION:
The resource is located at the foot of Mount Coot-tha between Sir Samuel Griffiths Drive and the Botanic Gardens (see map KRA 42).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of hornfels within the Bunya Phyllite, which extends into the Brisbane Forest Park to the west. The rock appears to have been hornfelsed by an underlying granite.

A large quarry is operated by the Brisbane City Council in the hornfels at the northeastern end of this ridge, east of the present location of Sir Samuel Griffiths Drive.

SIGNIFICANCE:
The resource in the present quarry layout is sufficient for over 20 years. The Mount Coot-tha resource currently supplies the Brisbane City Council exclusively with material suitable for most construction applications.

SEPARATION AREA:
The boundary of the available resource is constrained to the limit of planned extraction according to the Mount Coot-tha Local Plan. Because the quarry is to be concealed from the surrounding land by retention of the outer flanks of the ridge, a separation distance of 500 metres is applied over the areas to the south and west. The southeastern boundary is set along the nearest edge of the Western Freeway. It is constrained by existing buildings within the grounds of the Botanic Gardens.

The extent of the separation area north of Mount Coot-tha Road is constrained by small residential lots. The boundary of the Key Resource Area lies along Mount Coot-tha Road and extends to the north along Sir Samuel Griffiths Drive for 500 metres.

TRANSPORT ROUTE:
The transport of materials is directly onto the Mount Coot-tha Road at an exit near the boundary of the Botanic Gardens and thence onto the Western Freeway or Milton Road via the Toowong roundabout. Trucks enter the quarry at Mount Coot-tha Road near the intersection with Sir Samuel Griffiths Drive.

SPECIAL CONSIDERATIONS:
The resource/processing area is adjacent to the Brisbane Forest Park.

BEACHMERE KEY RESOURCE AREA – KRA 43

LOCAL GOVERNMENT AREA: Caboolture Shire

LOCATION:
The resource occurs north of the Caboolture-Beachmere Road on Wallace Road, 2 kilometres northwest of the coastline of Beachmere township, some 10 kilometres southeast of Caboolture (see map KRA 43).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of dune sand occurring as beach accretion ridges, and occupies a broad band trending northeast, sub-parallel to the present coastline. The sand is light to mid brown, becoming pale to mid grey with depth, mainly fine to medium grained, with some coarse grained at depth. In places, there are concentrations of shell material. The material ranges from 3 metres to over 9 metres in depth.

SIGNIFICANCE:
The resource currently supplies a large proportion of construction material requirements in the north Brisbane and the Sunshine Coast markets. The remainder under mining lease is capable of supplying specialist sands markets, as well as concrete and asphalt aggregate for regional markets.

SEPARATION AREA:
A maximum separation area of 200 metres has been adopted around the resource where there is Rural zoning. This is constrained in the northeastern corner to less than 100 metres by Residential zoning. Where there is a Mining Lease or a Mineral Development Licence boundary in rural residential zoning, the resource extent is limited to within 40 metres of the boundary by setback requirements under the *Mineral Resources Act 1989.*

TRANSPORT ROUTE:
The route from the current site is along Wallace Road to Beachmere Road. A future access route from the north is shown through company-owned land, west along a State Forest access road, onto Browns Road, then onto the Caboolture-Bribie Island Road.

SPECIAL CONSIDERATIONS:
An area of 'of concern' vegetation under the *Vegetation Management Act 1999* (paperbark swamp) in the resource/processing area is excluded from extraction by existing permit conditions. In addition, an area of 'essential habitat' occurs in the southeast of the resource/processing area and contains areas of State biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment.

BRACALBA KEY RESOURCE AREA – KRA 44

LOCAL GOVERNMENT AREA: Caboolture Shire

LOCATION:
The resource is located approximately 17 kilometres west of Caboolture on the D'Aguilar Highway (see map KRA 44).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The rock resource consists of fresh, hard, greenstone, hornfelsed greenstone and granite (tonalite) occurring at the base of the D'Aguilar Range. Overburden is minimal over much of the site. Quarries are sited in greenstone and tonalite in the south, and in tonalite to the northeast of the D'Aguilar Highway.

SIGNIFICANCE:
The resource is sufficient for at least 50 years supply. A wide range of concrete aggregates, road bases, rip rap and other coarse aggregates is supplied from the existing quarries.

SEPARATION AREA:
The southern perimeter of the southern resource forms a northeasterly trending ridge, allowing a separation distance of 500 metres. As the country to the east has no intervening ridges, the full separation distance of 1000 metres has been applied.

The northern resource is surrounded by open country zoned as rural to the northeast and east, thus the full 1000 metre separation distance is applied, except along the crest of the D'Aguilar Range to the northwest.

The western boundary is set at 500 metres southwest and west of the southern resource as this area is shielded by spurs extending from the D'Aguilar Range. The easement of McLeod's Road coincides with the crest of the D'Aguilar Range. This road is designated as the boundary of the Key Resource Area in the northwestern direction.

TRANSPORT ROUTE:
Materials are transported directly on to the D'Aguilar Highway within the KRA.

SPECIAL CONSIDERATIONS:
The northern end of the resource/processing area contains areas identified with 'Regional' significance in the Environmental Protection Agency's Biodiversity Planning Assessment.

MELDALE / DONNYBROOK KEY RESOURCE AREA – KRA 45

LOCAL GOVERNMENT AREA: Caboolture Shire

LOCATION:
The resource occurs some 13 kilometres northeast of Caboolture on the north side of Elimbah Creek near the intersection of Meldale and Donnybrook Roads in Donnybrook. It is bordered on the northeast by the tidal area of Bullock Creek (see map KRA 45).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises alluvium of Elimbah and Bullock Creeks and consists of a mainly fine to coarse grained sand with a silty and clayey overburden and in places, a similar interburden. It occupies some 65 hectares.

SIGNIFICANCE:
The resource contains sufficient material for well over 10 years at the proposed extraction rate, and can produce a large proportion of supply requirements in the north side of Brisbane City, and Caboolture Shire and Sunshine Coast markets. Extraction has been approved in the Planning & Environment Court and by Environment Australia (Commonwealth Government).

SEPARATION AREA:
The full separation distance of 200 metres is adopted around the resource.

TRANSPORT ROUTE
The transport route is along Donnybrook Road, and then onto Pumicestone Road to the Bruce Highway.

SPECIAL CONSIDERATIONS:
The KRA is located directly adjacent to the Pumicestone Channel Fish Habitat Area. As a result, the separation area around the resource/processing area retains a buffer width of 200 metres to the Pumicestone Channel Fish Habitat Area.

NARANGBA KEY RESOURCE AREA – KRA 46

LOCAL GOVERNMENT AREA: Pine Rivers and Caboolture Shires

LOCATION:
The resource extends from west of Narangba, to Oceanview west of Caboolture (see map KRA 46).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource comprises greenstone, tonalite and the hornfelsed rocks around the tonalite intrusion. These rock units occur in a northwesterly trending zone between Petrie and Oceanview.

The resource is currently worked by one major quarry and supplies a wide range of crushed rock. Another large quarry is proposed by another company to the west of the existing quarry. There are also three potential resource areas, which require further investigation.

SIGNIFICANCE:
There are substantial resources present which are conveniently situated to supply the north Brisbane urban area and the north coast markets. In excess of 100 years supply at current rates of extraction is present in the site. The potential to support much larger rates of extraction is thus considerable.

SEPARATION AREA:
A separation distance of 500 metres on the southwestern side of the known resource is considered adequate, as high ridges in the separation area screen the resource area. The separation area covers the western slopes of the ridges, and encroaches only slightly onto the lower country. In the northwestern corner 600 metres has been adopted due to the probable use of this part of the site for stockpiling only.

The boundary to the north and east is mostly set at 1000 metres from the resource, being closer where ridge lines are less than 1000 metres distant.

TRANSPORT ROUTE:
The transport of materials is currently along Raynbird and New Settlement Roads to the Bruce Highway. However, a Dedicated Haulage Corridor has been recommended for future use in a major study commissioned by the Department of State Development and Innovation, and has been endorsed as a matter of State interest. The shortest transport route from the southern resource would be provided by Neilson, Theodore and Smith Roads.

SPECIAL CONSIDERATIONS:
The KRA contains areas of 'of concern' vegetation under the *Vegetation Management Act 1999*, a koala conservation area shown in the SEQ Regional Plan – Interim Guideline: Koalas and Development, and areas having regional biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment. A wildlife corridor supports seasonal east - west raptor migration.

NINGI KEY RESOURCE AREA – KRA 47

LOCAL GOVERNMENT AREA: Caboolture Shire

LOCATION:
The resource occurs south of the Caboolture-Bribie Island Road, and between Bestmann Road and Peel Road at Ningi, and the coastline of Godwin Beach, from 12 to 15 kilometres east of Caboolture (see map KRA 47).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resource is comprised of sand dunes of varying ages occurring as beach accretion ridges, and occupies a broad band trending east-northeast to northeast, sub-parallel to the present coastline. The younger sand is light to mid brown, becoming pale to mid grey with depth, mainly fine to medium grained, with some coarse grained at depth. The older dune sand is white, fine to medium grained, and well leached. The material ranges from 3 metres to over 9 metres in depth.

SIGNIFICANCE:
The resource is sufficient to meet a large proportion of supply requirements in the north Brisbane and the Sunshine Coast concrete and bituminous aggregate markets. The remainder under mining lease would be able to supply specialist sands markets, as well as being capable of supply into regional aggregate markets.

SEPARATION AREA:
A maximum separation area of 200 metres is maintained around the resource, including areas with mining tenements. Residential lots in the northeastern corner constrain the separation distance to the resource boundary.

TRANSPORT ROUTE:
The route is from the current site on to Bestmann Road and to the Caboolture-Bribie Island Road. Future access from the northerly part of the resource, which is covered by mining lease, could be directly onto the Caboolture-Bribie Island Road.

SPECIAL CONSIDERATIONS:
The KRA contains areas of 'of concern' vegetation under the *Vegetation Management Act 1999*, areas having State biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment, and encompasses some cultural heritage sites of State significance.

GLASSHOUSE KEY RESOURCE AREA – KRA 48

LOCAL GOVERNMENT AREA: Caloundra City

LOCATION:
The resource is located approximately 4 kilometres southwest of the township of Glasshouse Mountains on the North Coast Railway line, and is accessed via Coonowrin Road (see map KRA 48).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises hard, welded, crystal-lithic tuff of the North Arm Volcanics. It occurs as a window beneath younger, overlying sandstone. Overburden depth varies from 1 to 12 metres, and averages about 4.5 metres.

A major quarry is established in the resource.

SIGNIFICANCE:
At the present rate of production there are at least 50 years of supply available. A wide range of concrete and asphalt aggregates, manufactured sand, road bases, rip rap and other coarse aggregates is supplied to a primary market extending from northern Brisbane to the southern Sunshine Coast.

SEPARATION AREA:
The resource is largely surrounded by low ridges, and is being extracted by the retreating skyline method. The lowest points are at the entrance near the intersection of Old Gympie and Mt Beerwah Roads, and a low gully in the northeastern corner.

Consequently the boundary of the separation distance is set at 500 metres from the final position of the planned quarry faces, wherever a ridge line shields the working quarry from the surrounding land. It has been increased to 1000 metres where the surrounding land is not screened by an intervening ridge.

TRANSPORT ROUTE:
Materials are transported via Coonowrin Road through the township of Glasshouse Mountains onto the Steve Irwin Way.

SPECIAL CONSIDERATIONS:
The KRA contains areas of 'endangered' vegetation (RE12.5.6) under the *Vegetation Management Act 1999*, and areas having regional biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment. This is covered by a pre-existing approval for extractive industry.

MERIDAN PLAINS KEY RESOURCE AREA – KRA 49

LOCAL GOVERNMENT AREA: Caloundra City

LOCATION:
The resource is located downstream of the Bruce Highway along the floodplain of the Mooloolah River (see map KRA 49).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of over 100 million tonnes of construction sand occurring in the alluvial flats of the Mooloolah River east of the Bruce Highway and north of Caloundra Road in Caloundra City, known as Meridan Plains. The material consists primarily of fine to coarse grained quartz sand and some fine gravel, with some sections of clayey sand, sandy clay and thin clay bands, with an overburden of mainly stiff clay. Average thickness of the sand resource is 10 metres under overburden ranging from 0.5 to 7 metres thick.

The resource is not currently worked.

SIGNIFICANCE:
The resource is significant as it has the potential to supply the Sunshine Coast and markets on the northside of Brisbane for the long term, which on current trends will be otherwise deficient in sources of construction sand.

SEPARATION AREA:
A full separation distance of 200 metres has generally been applied around the workable sand resource. This is constrained by rural residential property boundaries along Laxton Road on the northwestern boundary, and the Bruce Highway in the west.

TRANSPORT ROUTE:
The existing Sattler and Westaway Roads will be used in part, although locations of the access points to Caloundra Road are likely to be altered by the upgrading of this road to four lanes. A north-south Multi-modal Transport Corridor is planned just east of the eastern extent of the resource. This might provide alternative access to the eastern end of the resource.

SPECIAL CONSIDERATIONS:
The KRA contains land classified as good quality agricultural land (sugarcane - Moreton Mill Cane Growing Area Land Suitability). The resource/processing area may contain an Indigenous cultural heritage site of State significance. As the potential for sediment run-off and damage to riparian vegetation exists, a minimum buffer width of 50 metres from the resource/processing area to the Mooloolah River has been established. The presence of acid sulfate soils is possible at depth.

GLENVIEW KEY RESOURCE AREA – KRA 50

LOCAL GOVERNMENT AREA: Caloundra City

LOCATION:
The resource is within the alluvial flats of the Mooloolah River west of the Bruce Highway, north of the Steve Irwin Way and the Mooloolah Connection Road, and east of Stephens Road, and south of Glenview Road (see map KRA 50).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resource occurs in open agricultural land supporting cattle grazing and turf farming, as well as two working sand pits. It consists of fine to coarse grained quartzose alluvial sand averaging about 10 metres thickness with overburden of clay, sandy clay and loam from 4 to 5 metres thick.

SIGNIFICANCE:
The remaining resource is estimated to be sufficient for about 30 years supply to existing markets in Caloundra City, and areas north to Noosa Shire and south towards Brisbane.

SEPARATION AREA:
A separation distance of 200 metres from the edge of the resource has been adopted over rural land. The separation to the Bruce Highway is less than 200 metres on the eastern side. To the northwest, the separation area is constrained to the south side of Glenview Road near the Primary School reserve. On the north side, it is constrained by the small rural and rural residential lots south of Glenview Road.

TRANSPORT ROUTE:
The current workings have direct access to the adjacent main roads, the Steve Irwin Way and the Mooloolah Connection Road.

SPECIAL CONSIDERATIONS:
The resource/processing area is situated within the alluvial flats of the Mooloolah River. A minimum buffer width of 50 metres has been established from the resource/processing area to the river.

SUNROCK KEY RESOURCE AREA – KRA 51

LOCAL GOVERNMENT AREA: Caloundra City

LOCATION:
The resource is located approximately 3 kilometres northeast of Beerburrum on Nursery Road, east of the Steve Irwin Way (see map KRA 51).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of fresh, hard, dark brown, olivine trachyte occurring in a plug at Stoney Knob to the northeast of Beerburrum. There is minimal overburden.

It is the site of a major quarry supplying a wide range of crushed rock products.

SIGNIFICANCE:
The remaining resource will last about 30 years. A wide range of products is supplied to a primary market extending from northern Brisbane to the southern Sunshine Coast.

SEPARATION AREA:
The quarry is being widened and deepened by reducing the height of the surrounding ridgeline and a bund of spoil material is being developed on the western side to screen the operations from that direction. As this area is zoned Rural in the current Caloundra City Planning Scheme, a separation distance of 500 metres has been adopted around this part of the resource, being constrained by the Steve Irwin Way.

The processing area, including crushers and screening plant, is situated on the eastern side of the resource. This boundary is accordingly set at 1000 metres from the plant as there are no intervening ridges to the south and east of the quarry. This part of the separation area is within State Forest. Future development will include deepening and widening of the pit such that its surface extent will exceed the surface expression of the resource.

TRANSPORT ROUTE:
The rock is transported via Nursery Road onto the Steve Irwin Way. Provision is made for a potential future alternative route northeastwards to the Bruce Highway via the Johnsons Road overpass.

BLI BLI KEY RESOURCE AREA – KRA 52

LOCAL GOVERNMENT AREA: Maroochy Shire

LOCATION:
The resource is located about 3 kilometres northeast of Nambour on the eastern side of the Bruce Highway (see map KRA 52).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of andesite and other volcanic rocks. The existing quarry was formerly sited in rhyolitic welded tuff of the same formation.

The quarry supplies a wide range of crushed rock products.

SIGNIFICANCE:
The resource is sufficient for about 10 years of supply. A wide range of products is supplied to a market extending throughout the central and southern Sunshine Coast and hinterland areas.

SEPARATION AREA:
The separation area boundary is set at 500 metres from the limits of the resource, as ridge lines shield the resource from the surrounding countryside. This is in accordance with the existing Maroochy Shire Planning Scheme.

TRANSPORT ROUTE:
Materials are transported directly onto Cooney Road and then southwards to a large roundabout on the Bli Bli Road.

SPECIAL CONSIDERATIONS:
Although the rock resource extends into the Parklands Forest Reserve, the full resource area has not been shown on the accompanying map. Appropriate final land tenures for the Parklands Forest Reserve are currently under consideration as part of the SEQ Forest Agreement. When these considerations are completed, the KRA boundaries can be finalised.

IMAGE FLAT KEY RESOURCE AREA – KRA 53

LOCAL GOVERNMENT AREA: Maroochy Shire

LOCATION:
The resource is located approximately 3 kilometres northwest of Nambour, and is accessed via Image Flat Road (see map KRA 53).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises flow-banded rhyolite. The rhyolite varies from distinctly weathered in the upper faces to slightly weathered in the lower faces.

SIGNIFICANCE:
At the present rate of production there are at least 15 years of resources available. Resources appear to extend to the north but are in State Forest. A wide range of products is supplied to a market extending throughout the central and southern Sunshine Coast.

SEPARATION AREA:
The boundary of the separation area is set at 500 metres from the outer limits of the resource, as ridge lines shield much of the the resource from the surrounding countryside. This is in accordance with the existing Maroochy Shire Planning Scheme.

TRANSPORT ROUTE:
The transport route passes directly onto Image Flat Road. It then reaches the Bli Bli Road via Image Flat Road, or Duhs Road and Zealey Road.

SPECIAL CONSIDERATIONS:
The KRA coincides with the Wappa State Forest, which contains areas of State and regionally significant biodiversity values under the Environmental Protection Agency's Biodiversity Planning Assessment. The Wappa State Forest is the subject of an agreement between the Environmental Protection Agency and the Department of Primary Industries to remain as state forest tenure for local government extractive industry purposes, and therefore will not be transferred to protected area under the *Nature Conservation Act 1992* as part of the SEQ Forest Agreement. On the northern and eastern side of the KRA is the Maroochy Forest Reserve 2, which has been recommended as National Park under assessment for the SEQ Forest Agreement.

YANDINA CREEK KEY RESOURCE AREA – KRA 54

LOCAL GOVERNMENT AREA: Maroochy Shire

LOCATION:
The resource lies 9 kilometres west of Coolum and is located west of McCord's Road and Yandina Creek Road (see map KRA 54**).**

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource comprises hard intrusive diorite and rhyolite flows, which crop out as numerous slabs and bluffs around the low hills between McCords Road, Pryor Road and Yandina Creek northwest of the Toolborough Road quarry. The resource is currently undeveloped.

SIGNIFICANCE:
The Yandina Creek resource is strategically placed to provide construction aggregates and armour stone for a large part of the northern Sunshine Coast.

SEPARATION AREA:
The full extent of the resource has not yet been defined by subsurface investigations. The resource limit is determined by the hills that would need to be retained to screen operations from adjacent lots to the north, west and south. This allows a separation distance of 500 metres. The separation area on the east is set at the toe of the adjacent ridge slope at about 500 metres.

TRANSPORT ROUTE:
The entry point of the transport route to the adjacent roads is most likely to be on the eastern side of the resource entering McCords Road and Yandina Creek Road and then onto Toolborough Road to the Yandina-Coolum Road. This is the shortest route to the Sunshine Coast Motorway and enters the Yandina-Coolum Road at an established truck entry point.

SPECIAL CONSIDERATIONS:
The KRA contains areas of vegetation having State biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment and forms part of a bioregional wildlife corridor. It also contains records of flora and fauna species of significance under the *Nature Conservation Act 1992* and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999,* including migratory bird species.

TOOLBOROUGH ROAD KEY RESOURCE AREA – KRA 55

LOCAL GOVERNMENT AREA: Maroochy Shire

LOCATION:
The resource is located approximately 5 kilometres west of Coolum on the Sunshine Coast (see map KRA 55**).**

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource comprises welded volcanic tuff of moderately to slightly weathered trachyandesite composition. Some variation in texture to agglomeratic type rocks occur in the lower part of the resource.

It is the site of a very large quarry sited within the southern end of the resource adjacent to Toolborough Road.

SIGNIFICANCE:
There are substantial resources remaining in the deposit and it is conveniently situated to supply the markets of the Sunshine Coast hinterland. It is understood that the resource is sufficient for 40 years of supply at current levels of extraction.

SEPARATION AREA:
The boundary of the separation area is 500 metres from the property boundary of the block held by the quarry. This is adequate for areas to the north and east as there is a continuous intervening ridge line.

To the west and south a greater separation distance would be required unless the western flank of the ridge is left intact or worked by the retreating tree line method. The presently worked faces on the eastern side of the quarry are being extended eastwards and then northwards within the quarry. The distance from these faces to the southern boundary is over 1000 metres.

It may be feasible in the future to extend the quarry to the west, thus providing an additional ten years of supply. Thus the separation area is extended approximately 150 metres further west to allow for this possibility.

TRANSPORT ROUTE:
The transport route is along Toolborough Road to the intersection with the Yandina to Coolum Road.

SPECIAL CONSIDERATIONS:
The KRA contains an area with State biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment, which contains Special Biodiversity Values and forms part of a bioregional wildlife corridor.

RINGTAIL CREEK KEY RESOURCE AREA – KRA 56

LOCAL GOVERNMENT AREA: Noosa Shire

LOCATION:
The resource is located approximately 10 kilometres northwest of Tewantin, and is accessed via McKinnon Drive from Tewantin (see map KRA 56**).**

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of a wide, slightly to moderately weathered trachyte dyke or sill. The dyke is partly exposed in an old Forestry pit on Ringtail Creek Road. The intrusion forms a broad gently sloping ridge elongated along a northwesterly direction. It is partly forested.

SIGNIFICANCE:
Although present production levels are small, the location of the resource close to a major growth area and the shortage of alternative sources will ensure its strategic significance, given the considerable distance to quarry rock resources in adjacent Shires. The resource could extend to a considerable depth, as it is an intrusive body, allowing considerable deepening.

SEPARATION AREA:
The boundary of the separation area is set at 1000 metres from the western, southwestern and northern sides of the resource held within Council land. The proximity of small subdivisions to the southeast constrains the separation distance to 500 metres in that area. The southeastern flank of the ridge would need to be retained to screen operations from that direction.

TRANSPORT ROUTE:
The transport route is along Ringtail Creek Road onto McKinnon Drive and then to the Noosa market area.

SPECIAL CONSIDERATIONS:
The KRA contains areas of 'of concern' vegetation under the *Vegetation Management Act 1999*, an area of endangered, vulnerable or rare species under the Environmental Protection Agency's Biodiversity Planning Assessment and forms part of the state significant Diaper State Forest – Peregian bioregional wildlife corridor. The resource/processing area is adjacent to a site of indigenous cultural significance which includes a ceremonial ground.

WAHPUNGA RANGE KEY RESOURCE AREA – KRA 57

LOCAL GOVERNMENT AREA: Noosa Shire

LOCATION:
The resource is located approximately one kilometre east of Kin Kin, and is accessed via the Gympie to Kin Kin Road (see map KRA 57**).**

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
A large elongate body of fresh to moderately weathered intrusive andesite occurs in the Wahpunga Range east of Kin Kin. The deposit occurs as a ridge extending southeast from the Gympie to Kin Kin road onto private property. The intrusion is 150 metres wide. Drilling and testing indicated suitability for bitumen screenings and road-pavement gravels.

Suitability for concrete aggregate has not been confirmed.

SIGNIFICANCE:
Although present production levels are small, the sparsity of other resources close to major growth areas in the Noosa and Cooloola Shires means it will be of strategic significance for many years. Significant resources are present and the deposit is considered to be the most important in the Noosa area, although disadvantaged by distance from markets. It is likely to become a significant source of rock products for the northern Sunshine Coast and Cooloola.

SEPARATION AREA:
The resource is sited on a high ridge, and will need to be worked by the retreating tree line method to optimise extraction from the intrusive dyke. The residential areas of Kin Kin lie about 1000 metres west of the northern end of the resource, and the full distance has been adopted for the separation area. The surrounding country is zoned as Rural therefore a separation distance of 1000 metres around the resource is adequate.

TRANSPORT ROUTE:
The transport route passes through Shepperson's property onto Shepperson's Lane and then onto the Gympie to Kin Kin Road.

WHITESIDE KEY RESOURCE AREA – KRA 58

LOCAL GOVERNMENT AREA: Pine Rivers Shire

LOCATION:
The resource is located about 10 kilometres west of Petrie, north of Lake Samsonvale (see map KRA 58).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource comprises a northwesterly elongated deposit of greenstone shown as two separate deposits.

Two major quarries, one in each deposit, supply a wide range of crushed rock products. There is also a considerable resource present in the intervening area under separate ownership.

SIGNIFICANCE:
There are substantial resources remaining, which are conveniently situated to supply the north Brisbane urban area and north coast districts. The parts of the resource held under permit are sufficient for between 20 and 50 years of supply. The existing quarries supply over 20 percent of the northern Brisbane market.

SEPARATION AREA:
A separation distance of 500 metres has been adopted on the southwestern side of the known resource, as high ridges screen the resource area on that side. On the northern and eastern sides the full 1000 metres is considered necessary due to exposure of the resource to adjoining land. At the southeastern end, the separation area is constrained by the residential blocks between Lake Samsonvale and the Dayboro Road and rural residential blocks on Dunlop Lane.

TRANSPORT ROUTE:
The transport of materials from the eastern quarry is onto Dunlop Lane and then the Dayboro Road. Transport from the western quarry is directly onto the Dayboro Road.

An additional route from the undeveloped middle part of the resource would be provided by Adsetts Road (the original Dayboro Road) to avoid transport of materials from this part of the resource through the existing quarry to the west.

SPECIAL CONSIDERATIONS:
The KRA contains areas of 'of concern' vegetation under the *Vegetation Management Act 1999*.

PINE RIVERS NORTH KEY RESOURCE AREA – KRA 59

LOCAL GOVERNMENT AREA: Pine Rivers Shire and Brisbane City

LOCATION:
The resource is located east of Strathpine-Lawnton and north of Bald Hills. It is west of the Bruce Highway bridge, east of Gympie Road, Lawnton, and north of the Bald Hills flats-North Coast Railway crossing of the South Pine River (see map KRA 59).

EXTRACTIVE RESOURCE: Sand and Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
The resource is mainly fine to coarse grained sand and gravel. It comprises sand and gravel up to 15 metres thick beneath 1 to 4 metres of overburden of mainly loam and silty clay. Three areas of resource have been delineated due to allowance for set-backs from riparian zones along the North and South Pine Rivers and tributaries intersecting the deposit.

SIGNIFICANCE:
Resources are sufficient to meet a large proportion of supply requirements in the Pine Shire and north side of Brisbane markets for over 10 years. Their proximity to major growth areas is of strategic significance.

SEPARATION AREA:
The separation distance surrounding the delineated resource is mostly 200 metres. The distance is constrained to the nearest boundary of Urban lots where they are within 200 metres of the resource, such as north of Grahams Road, in the mid southwest of the KRA, and the northeast extent of Learmonth Street in the south-southwestern part of the KRA, both in Pine Rivers Shire, and in Bald Hills, Brisbane, in the southeast of the area.

TRANSPORT ROUTE:
The transport route is northwest along Lawnton Pocket Road to Gympie Road. Transport for the material in the other parts of the resource, between Four Mile Creek and the South Pine River, and in Brisbane City, has not yet been considered, but would be within the KRA.

SPECIAL CONSIDERATIONS:
The KRA contains an area with State and regionally significant biodiversity values under the Environmental Protection Agency's Biodiversity Planning Assessment, including habitat for bird species of significance under the *Nature Conservation Act 1992* and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* and forms part of a bioregional wildlife corridor identified for raptors. A cultural heritage site of State significance (scarred tree) occurs in the vicinity.

A small area of endangered vegetation under the *Vegetation Management Act 1999*, located near the southern end of the northern section of the resource/processing area, is under a pre-existing extractive industry approval. The resource/processing area is situated adjacent to the North and South Pine Rivers and buffer widths ranging from 40 to 100 metres have been established from the resource/processing area to the river.

PINE RIVERS SOUTH KEY RESOURCE AREA – KRA 60

LOCAL GOVERNMENT AREA: Pine Rivers Shire and Brisbane City

LOCATION:
The resource is located south of the North Coast Railway bridge crossing of the South Pine River flats west of Bald Hills. The resource lies within the alluvium of the South Pine River, and in Pine Rivers Shire to the west and in Brisbane City to the east. The western extent is in Pine Rivers Shire upstream of Scouts Crossing Road in Brendale (see map KRA 60).

EXTRACTIVE RESOURCE: Sand and Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of mainly fine to coarse grained sand and gravel. It is up to 15 metres thick with some substantial clay interbeds beneath 1 to 4 metres of overburden of mainly loam and silty clay.

SIGNIFICANCE:
The resource would be able to supply a large proportion of requirements in the Pine Shire and north side of Brisbane markets. Reserves sufficient for over 10 years at current production levels have been reported for the site, which would include both east and west of the river (in Brisbane and Pine Rivers respectively).

SEPARATION AREA:
The separation distance from the boundary of the delineated resource is 200 metres over rural land. It is constrained to the railway reserve corridor to the north, along parts of Gympie Road to the northeast and east, and on Roghan Road and along the southern boundary of the South Pine River to the southeast and south.

TRANSPORT ROUTE:
The transport route is along Johnstone Road to the west onto South Pine Road.

SPECIAL CONSIDERATIONS:
The resource/processing area is situated on both sides of the South Pine River. A minimum buffer width of 35 metres has been established from the resource/processing area on the western side of the River (Pine Rivers Shire) and a minimum buffer width of 50 metres has been established from the resource/processing area on the eastern side of the River (Brisbane City Council). In addition, Linkfield Road (under construction) has sterilised some resources at the southern end of the Brisbane section, and a set-back of 20 metres from the northern alignment of the proposed road has also been applied.

BROMELTON KEY RESOURCE AREA – KRA 61

LOCAL GOVERNMENT AREA: Beaudesert Shire

LOCATION:
This resource, which forms a broad flat-topped hill, is located 5 kilometres west of Beaudesert. The Sydney to Brisbane railway line passes immediately to the west of the resource (see map KRA 61).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of a thick basalt flow forming a broad flat-topped hill west of the Logan River. A small quarry was formerly operated by the Beaudesert Shire Council at the western end of the resource.

The resource comprises high quality basalt 33 to 65 metres thick. This overlies a weathered basalt of poor quality. Total inferred resources are about 100 million tonnes.

SIGNIFICANCE:
The resource is conveniently situated to supply the Beaudesert Shire and Logan, Ipswich and Brisbane City markets by either road or rail transport for up to 100 years at the planned rates of extraction.

SEPARATION AREA:
The surrounding country is lower than the resource and is mostly zoned as Rural, thus the 1000 metre separation distance has been adopted. The full 1000 metre separation distance from the resource also applies over the industrial estate on the western side of the railway line, and 700 to 1000 metres over rural land to the north.

The separation area is constrained by Rural Residential lots to the southwest, which are less than 1000 metres from the resource. The southwest flank of the hill will partly screen the operations from these Rural Residential lots.

TRANSPORT ROUTE:
Two access points to Sandy Creek Road are planned. The southern operation will utilise a road close to the existing Beaudesert Council quarry road to Sandy Creek Road. The northern operation will utilise a new access point to Sandy Creek road 300 metres north of the Council quarry road. Most materials will be transported northwards along Sandy Creek Road to the Beaudesert - Boonah Road.

SPECIAL CONSIDERATIONS:
Small areas of 'endangered' vegetation under the *Vegetation Management Act 1999* occur throughout the resource/processing area. All but one of these is covered by pre-existing approvals.

BLUE ROCK KEY RESOURCE AREA – KRA 62

LOCAL GOVERNMENT AREA: Gold Coast City

LOCATION:
The resource is located about 10 kilometres southwest of Beenleigh along the Beaudesert to Beenleigh Road (see map KRA 62).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The Blue Rock resource consists of greenstone and greywacke is located in the head of the valley of a minor tributary of the Albert River, north of Cedar Creek.

A large quarry is sited on the resource.

SIGNIFICANCE:
Sufficient resources remain for 50 years of supply at current production rates. The resource is centrally located between the major urban centres of Brisbane and the northern Gold Coast, with a market area encompassing all or part of the Gold Coast, Brisbane, Redland, Logan, Ipswich and Beaudesert Local Government areas.

SEPARATION AREA:
A separation distance of 500 metres around the boundary of the resource and the processing area sited on the southwestern side of the resource is considered adequate, as the operations are screened from the surrounding area by steep ridges.

TRANSPORT ROUTE:
The transport route is along Tamaree Road to the west and then onto the Beaudesert to Beenleigh Road. The preferred transport route to reach the Pacific Highway is via Stanmore Road, which is also used by quarries in the Northern Darlington Range.

SPECIAL CONSIDERATIONS:
The KRA contains areas of State and regional biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment.

CARBROOK / EAGLEBY KEY RESOURCE AREA – KRA 63

LOCAL GOVERNMENT AREA: Gold Coast City and Logan City

LOCATION:
The resource is located on the northern and southern banks of the Logan River south of the Beenleigh – Redland Bay Road at Carbrook. The processing area is sited with the original workings on the northern bank of the river. On the south side of the river, the resource is located within the river's alluvial terrace at Eagleby (see map KRA 63).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resource of mainly fine to medium grained quartzose sand is within the alluvium of the Logan River. The sand is up to 10 metres thick beneath 3 to 4 metres of mainly loam and silty clay overburden. The material is dredged on the south side of the Logan River, and pumped to the processing plant through a pipeline buried in the bed of the river.

SIGNIFICANCE:
The resource is sufficient for several years to meet a large proportion of demand in the south Brisbane and Gold Coast markets, as well as export markets for specialist sand products.

SEPARATION AREA:
A full separation distance of 200 metres is designated around the entire perimeter of the resource and processing area, except where urban zoning constrains the boundary at the northwestern extremity in Logan City.

TRANSPORT ROUTE:
Sand is transported directly onto the Beenleigh – Redland Bay Road. Raw sand feed is pumped from the Eagleby site through a pipeline under the river to the Carbrook processing site, which should be considered part of the transport route in case of incompatible developments on the river banks.

SPECIAL CONSIDERATIONS:
The KRA is located directly adjacent to the Logan River, which contains fish habitats, and the riverbank in this location is likely to be vegetated with protected marine plants. As a result, the resource/processing area reflects a minimum riparian buffer width of 100 metres on the southern side of the river.

Some 'of concern' vegetation under the *Vegetation Management Act 1999* occurs within the pre-existing approval on the southern side of the Logan River. Other areas of 'of concern' vegetation are immediately adjacent to the resource/processing area to the west of the approved area.

CHARLIES CROSSING KEY RESOURCE AREA – KRA 64

LOCAL GOVERNMENT AREA: Gold Coast City

LOCATION:
The resource is within the alluvial flats between the Coomera River and an anabranch, west of the Pacific Highway and the town of Oxenford and between the Tamborine – Oxenford and Oxenford – Coomera Gorge Roads (see map KRA 64).

EXTRACTIVE RESOURCE: Sand and Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of fine to coarse grained quartzose and lithic alluvial sand and gravel with overburden of clay, clayey sand, silt, and loam. The overburden thickness averages 3.5 metres, with underlying gravel and sand from 3.0 to 11.0 metres depth. Large boulders up to 1 metre diameter within the gravel beds are not uncommon.

SIGNIFICANCE:
The resource is the last major sand and gravel source available adjacent to the Gold Coast market area. It supplies material to the Gold Coast and southern Brisbane markets.

SEPARATION AREA
A full separation distance of 200 metres has been adopted around the entire perimeter of the gravel and sand resource, except for constraints set by existing closer urban and park residential blocks. These occur in the area along the northern section, south of the Tamborine – Oxenford Road, along the western side between the northern anabranch of the Coomera River and Glenview Road, and on the southern side between the Oxenford – Coomera Gorge Road and the southern anabranch of the Coomera River. The area to the east is amalgamated with that for the Oxenford Key Resource Area (KRA 68).

TRANSPORT ROUTE
Materials are transported directly onto Oxenford – Coomera Gorge Road opposite the Oxenford quarry entrance.

SPECIAL CONSIDERATIONS:
The resource/processing area lies between the Coomera River and an anabranch. A minimum buffer width of 40 metres has been established between the resource/processing area and both the Coomera River and its anabranch. A very small area of 'of concern' vegetation under the *Vegetation Management Act 1999* occurs along the riparian zone immediately upstream of the Tamborine – Oxenford Road river crossing. This has been excluded from the resource/processing area.

JACOBS WELL KEY RESOURCE AREA – KRA 65

LOCAL GOVERNMENT AREA: Gold Coast City

LOCATION:
The resource area is within the extensive estuarine/ alluvial plain, and comprises five resources (See map KRA 65, Deposits A to E) extending from the Logan River (Deposit A) to south of the Pimpama River (Deposit E).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resources consist of mainly fine grained rounded quartzose sand of estuarine and marine origin with an overburden of organic-rich topsoil, clay, sandy clay and loam.
Deposit A contains up to 25.5metres of sand (average 7 metres), with an overburden of 0.9 to 1.2 metres. An Extractive Industry Permit covers the northern portion of this section.
Deposit B contains sand averaging 8 metres thick, with an overburden of 0.6 to 1.1 metres. Four extractive operations are currently producing sand for concrete aggregate.
Deposit C contains sand ranging from 1 to 11 metres thick (averaging 4.7 metres), with overburden about 1.7 metres thick.
Deposit D contains sand from 2 to 11 metres in thickness, with clayey sand overburden averaging 1.4 metres thick.
Deposit E contains sand 1 to 11 metres thick, with an overburden 0.5 metres thick.

SIGNIFICANCE:
The resource represents the Brisbane to Gold Coast market's one remaining source of fine sand for concrete and asphalt. It is particularly important as a source of fine natural sand for blending with 'manufactured sand' produced by fine-crushing of quarry hardrock.

SEPARATION AREA:
The separation area of 200 metres width has been applied around the resource.

TRANSPORT ROUTES:
Deposits A and B access the Stapylton–Jacobs Well Road via Marks Road and Mill Road. Deposit C would access the Stapylton–Jacobs Well Road via Norwell Road, or the Pacific Motorway via Norwell Road, Pimpama –Jacobs Well Road and Mirambeena Drive. Deposits D and E would access the Pacific Motorway along Mirambeena Drive via the Pimpama – Jacobs Well Road, and Green Meadows Road/Kerkin Roads.

SPECIAL CONSIDERATIONS:
Deposits A and B are adjacent to significant wetlands of State significance under EPA's Biodiversity Planning Assessment. Deposit A abuts the Logan River and sensitive fish habitats such as the Jumpinpin-Broadwater Fish Habitat Area. A 100 metre buffer has been established between the resource/processing area and the Logan River. Deposit B contains 'of concern' vegetation under the *Vegetation Management Act 1999*, and areas having regional biodiversity significance. Localised heath at Jacobs Well is the only known habitat in Queensland of the Swordgrass Brown Butterfly. An area of 'of concern' vegetation in Area B is covered by pre-existing approvals. Much of the area currently produces sugar cane.

NERANG KEY RESOURCE AREA – KRA 66

LOCAL GOVERNMENT AREA: Gold Coast City

LOCATION:
The resource is located about 4 kilometres northwest of Nerang (see map KRA 66).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of metagreywacke, quartzite and argillite of the Neranleigh-Fernvale Beds. The northern end of the resource is the site of a large quarry. The resource extends southeast into State Forest 571 along a prominent ridge. It is constrained by the easement of a proposed electricity power line.

The rock types are suitable for the production of manufactured coarse sand.

SIGNIFICANCE:
The remaining resource is sufficient for more than 30 years supply at the current rate of extraction. The resource is strategically located for the major markets of the Gold Coast.

SEPARATION AREA:
As surrounding ridges screen the resource, a separation distance of 500 metres has been adopted over the State Forest and land to the east.

Low ridges shield the northern side of the resource, so that a 500 metre separation distance covering rural land owned by the quarry operator is sufficient to screen operations from urban zones further north. On the northeast, a separation distance of 500 metres has been adopted between the resource/processing area and the existing urban zone adjacent to Smith Street.

TRANSPORT ROUTE:
Materials are transported via Hymix Drive to the Pacific Motorway and the Smith Street entrance to the Motorway.

SPECIAL CONSIDERATIONS:
The KRA is adjacent to the Nerang Forest Reserve to the west and south and the Nerang State Forest to the south.

NORTHERN DARLINGTON RANGE KEY RESOURCE AREA – KRA 67

LOCAL GOVERNMENT AREA: Gold Coast City

LOCATION:
The resource is located west of the Pacific Motorway 5 to 8 kilometres south of Beenleigh and 40 kilometres southeast of Brisbane (see map KRA 67).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of resistant metagreywacke, quartzite and greenstone, and forms hilly terrain at the northern end of the Darlington Range. The resource area extends for about 6 kilometres in a northerly direction and is up to 4 kilometres wide.

Three large quarries are established in the northern Darlington Range, supplying in excess of 3 million tonnes of crushed rock. The rock is used for concrete and asphalt aggregates and crushed road base. Manufactured sand is also produced in substantial volumes.

An additional extractive operation has been approved, but full-scale production has not commenced.

SIGNIFICANCE:
The resource in the northern Darlington Range will provide the main long-term source of aggregates for markets in the Brisbane-Gold Coast growth corridor. The existing or proposed quarries cover most of the resource, which has an estimated life of about 100 years at the current rate of production.

SEPARATION AREA:
A 500 metre wide separation distance has been adopted from the outermost boundary of the available resource, which is defined as the edge of land parcels currently zoned for extractive industry.

TRANSPORT ROUTES:
Transport from the northern part of the resource is either directly onto Stanmore Road via Harts Road or Peachey Road, then to the Pacific Highway. Some transport takes place westward to the Beaudesert-Beenleigh Road via Stanmore Road. Transportation of materials from the eastern side of the resource is via Upper Ormeau Road to the Pacific Highway.

SPECIAL CONSIDERATIONS:
The majority of the KRA contains areas of State significance as well as identified habitat for endangered, vulnerable or rare species under the Environmental Protection Agency's Biodiversity Planning Assessment and the Southeast Queensland Nature Conservation Strategy. The area may also contain watercourses. A small area of 'of concern' vegetation under the *Vegetation Management Act 1999* lies along the boundary between two approved operations, and is protected by the boundary buffer zones required by permit conditions.

OXENFORD KEY RESOURCE AREA – KRA 68

LOCAL GOVERNMENT AREA: Gold Coast City

LOCATION:
The resource is located about 3 kilometres southwest of Oxenford (see map KRA 68), adjacent to the Charlies Crossing Key Resource Area (see also map KRA 64).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of greywacke that forms steep ridges southeast of the Tamborine – Oxenford Road.

A major quarry is located between two of the steeper ridges southeast of the intersection of the Tamborine – Oxenford Road and Oxenford – Coomera Gorge Road. This quarry supplies a wide range of crushed rock products.

SIGNIFICANCE:
The remaining resource is sufficient for between 30 and 50 years supply, and it is conveniently situated to supply the Gold Coast urban area and the southern Brisbane region markets.

SEPARATION AREA:
On the western and northern sides of the ridge where the face and operations are visible, the full 1000 metres separation distance is adopted over rural land thereby covering the flood plain and sand and gravel extractive operations of the Charlies Crossing (Coomera River) Key Resource Area. On the northwestern side, the boundary is constrained by the limit of the urban blocks along Oxenford – Coomera Gorge Road on the south side of the Coomera River.

On the northeast, the boundary follows the edge of the urban blocks around to the eastern side of the ridge. On the eastern and southern sides, the distance is constrained by urban zones. It increases progressively to the southeast corner to a maximum of 700 metres over rural land. It is set at 500 metres over the northern part of small rural lots along Yallaroi Road, as the quarry face will be hidden by the ridge of forested land. To the south and southwest, retention by the quarry operator of urban-zoned land as open space permits a separation distance of over 500 metres from the crushing plant.

TRANSPORT ROUTE:
The products are transported directly onto Oxenford – Coomera Gorge Road, then east along the Tamborine – Oxenford Road to the Pacific Motorway. The majority of the rock is transported to the Gold Coast, but some is transported to southern parts of Brisbane and Logan City.

STAPYLTON KEY RESOURCE AREA – KRA 69

LOCAL GOVERNMENT AREA: Gold Coast City

LOCATION:
The resource is located about 7 kilometres southeast of Beenleigh on the southern flank of Mount Stapylton (see map KRA 69).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of hard quartzite that occurs in thick layers forming resistant ridges.

Currently two moderate to large-sized quarries are located at the northern and southern ends of the resource.

SIGNIFICANCE:
The remaining resource is estimated to be sufficient for 15 to 20 years. The resource is well situated to supply both the Gold Coast and southern Brisbane markets with crushed rock products, in particular road base and concrete aggregate.

The facility producing manufactured sand at one quarry is an important substitute for natural sand, which would otherwise be extracted from watercourses or off-stream resources.

SEPARATION AREA:
As the resource at each active operation is screened from the surrounding land by ridges, a separation distance of 500 metres from the boundary of the resource has been adopted over Rural or Future Urban Zones.

TRANSPORT ROUTE:
The transport route for the northern quarry is via Stonemaster Drive and Quinns Hill Road and then onto Stapylton-Jacobs Well Road.

The transport route from the southern quarry is along Rossmans Road and Quarry Road and onto Stapylton-Jacobs Well Road.

WEST BURLEIGH KEY RESOURCE AREA – KRA 70

LOCAL GOVERNMENT AREA: Gold Coast City

LOCATION:
The resource is located about 3.5 kilometres southwest of Burleigh, adjacent to the Pacific Motorway (see Map KRA 70).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource is composed of major greywacke and quartzite bands. The greywacke is moderately weathered to fresh with some interbedded argillite. The quartzite is also interbedded with argillite.

Two quarries have operated in the quartzite resource and one in the greywacke resource on the northern side of the Pacific Highway for many years.

SIGNIFICANCE:
Both parts of the resource contain substantial volumes of quarry rock. It is the most conveniently situated resource to supply the Gold Coast urban market and surrounding district.

SEPARATION AREA:
The boundaries of the separation area are based on the boundaries of the extractive licences. The maximum separation distance adopted is 500 metres over surrounding land zoned as General Industrial, Recreational Parkland and Rural, assuming that low ridges or bunds remain around the quarries. However, Special Residential or Residential A Zones on the southern side of the Pacific Highway constrain the separation distance to less than 500 metres in that direction.

TRANSPORT ROUTE:
Materials are transported from the quarry along Bermuda Street directly onto the Pacific Highway. The Gold Coast City Council quarry materials are transported along Taree Street and Rudman Parade onto Burleigh Connection (Reedy Creek) Road.

SPECIAL CONSIDERATIONS:
The KRA forms part of the State significant Burleigh Heads-Great Dividing Range bioregional wildlife corridor, including areas identified as having State biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment and the SEQ Regional Nature Conservation Strategy. The KRA contains indigenous cultural heritage artefact scatters.

MOUNT COTTON KEY RESOURCE AREA – KRA 71

LOCAL GOVERNMENT AREA: Redland Shire and Logan City

LOCATION:
The resource is located to the west of Mount Cotton Road at Mount Cotton and forms part of the north-northwest trending ridge known as the Mount Cotton "range" as well as an area of more subdued topography to the west of the ridge (see map KRA 71).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The northeastern resource is primarily a steeply dipping quartzite bed that trends north-northwest and forms the spine of the ridge. A medium-sized quarry is located within this part of the resource. The quartzite is quarried for production of aggregates with a range of uses. Poorer quality phyllite/argillite materials adjacent to the quartzite are also quarried and used for fill or blended with the better quality quartzite aggregates for use in road base products. This resource is depleted.

The southwestern resource comprises a thick sequence of hard greywacke beds with minor interbeds of finer-grained rock (argillite). This large resource is also suitable for production of a wide variety of aggregate products

SIGNIFICANCE:
The resource is large and conveniently located to supply the Brisbane, Logan, Redlands and northern Gold Coast markets for many years. The Mount Cotton hardrock resource is also strategically important because of the scarcity of alternative resources in this part of southeast Queensland.

SEPARATION AREA:
Much of the resource is surrounded by ridges allowing the outer boundary of the separation distance to be set between 500 metres and 700 metres from the resource. It is set at the full 1000 metres on the southern side of the resource, where there are no ridges to provide screening from the surrounding area.

TRANSPORT ROUTE:
Transport of all materials is via an easement onto Mount Cotton Road.

SPECIAL CONSIDERATIONS:
The Key Resource Area is located within a koala conservation area shown in the SEQ Regional Plan – Interim Guideline: Koalas and Development. The resource/processing area has generally been set back 100 metres in the vegetated area and 40 metres in the non-vegetated area along the greywacke resource area's western boundary. This boundary was designed to exclude as much remnant vegetation as possible.

WEST MOUNT COTTON KEY RESOURCE AREA – KRA 72

LOCAL GOVERNMENT AREA: Redland Shire and Logan City

LOCATION:
The resource is located at Sheldon, between West Mount Cotton Road and Avalon Road (see map KRA 72).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises two rock types, quartzite and greywacke, interbedded with lesser amounts of low strength rocks. Weathered overburden materials also form part of the resource. The resource supports a large quarry that produces aggregates and road bases. The weathered overburden and low strength rocks are extracted for use as fill.

SIGNIFICANCE:
The greywacke resource is sufficient for 50-100 years supply. The quartzite resource continues beyond the area outlined and would be sufficient for 20-30 years if all the area with an extractive licence is used. The two resources are strategically located in an area where there is a scarcity of approved alternatives. It is also convenient to markets in the southeastern Brisbane, Redlands and Port of Brisbane areas.

SEPARATION AREA:
The separation area retains a 500 metres minimum distance from the resource limit where intervening topography would provide adequate screening of quarrying operations. Where such screening is absent, the separation distance is up to 1000 metres. The separation distance encompasses parts of the Venman Bushland National Park and the Koala Bushland Coordinated Conservation Area to the south and west of the resource area. The intent of the separation area is consistent with the conservation aims for these areas.

TRANSPORT ROUTE:
Transport of all materials is via West Mount Cotton Road connecting with the Mount Cotton Road.

SPECIAL CONSIDERATIONS:
The Key Resource Area is located within a koala conservation area shown in the SEQ Regional Plan – Interim Guideline: Koalas and Development, adjacent to Venman Bushland National Park and the Koala Bushland Coordinated Conservation Area. The resource/processing area has been set back:

- 200 metres adjacent to Venman Bushland National Park to the south; and
- 150 metres adjacent to land east and west of the resource area. Land to the west is within a koala conservation area and is designated as a Coordinated Conservation Area under the *Nature Conservation Act 1992*. Land to the east is within a koala conservation area.

A small area of 'endangered' vegetation under the *Vegetation Management Act 1999* lies on the northwest margin of the resource/processing area. This is included within the pre-existing approval area.

DINGYARRA KEY RESOURCE AREA – KRA 73

LOCAL GOVERNMENT AREA: Esk Shire

LOCATION:
The southern end of the resource lies 1 kilometre east of Toogoolawah, and it extends for 2 kilometres northwest of this point (see map KRA 73).

EXTRACTIVE RESOURCE: Sand and Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
A broad lower alluvial terrace on the eastern (right) bank of Cressbrook Creek is underlain by up to 12 to 14 metres of alluvium. The uppermost 4 metres to 9.5 metres consist of sandy to silty clay. The resource below consists of varying sand, silty or clayey sand and clayey to clean gravel, ranging from 3.5 metres to 6 metres in thickness. The lowest gravel tends to be very clayey. The lateral variability of the sand and gravel layer is considerable.

A potential resource of 9.5 million cubic metres exists under the terrace, assuming a thickness of 5 metres.

SIGNIFICANCE:
The deposit is strategically located to supply the western Brisbane, Ipswich, Esk and Gatton Shire markets. Transport to the South Burnett region and the Kilcoy and Caboolture Shires is also feasible. It contains sufficient material for several decades of supply at the projected rate of consumption.

SEPARATION AREA:
The full 200 metres separation distance is adopted around the entire perimeter of the resource. This is due to the generally level and cleared condition of the terrace.

TRANSPORT ROUTE:
The likely transport route will be from the 'Dingyarra' property onto Harch Road soutwards onto Mount Beppo Road and then to the Brisbane Valley Highway at Toogoolawah to the west.

SPECIAL CONSIDERATIONS:
The KRA contains land classified as good quality agricultural land (1994 Esk DPI Agricultural Land Classes Map; Brisbane Valley Area-Esk Sheet Land Suitability). The resource/processing area is adjacent to Cressbrook Creek and a minimum buffer width of 50 metres from the resource/processing area to the creek has been established.

GLEN ARDEN KEY RESOURCE AREA – KRA 74

LOCAL GOVERNMENT AREA: Esk Shire

LOCATION:
The resource lies inside a horseshoe bend on the left bank of the Brisbane River 11 kilometres east-southeast of Toogoolawah (see map KRA 74). It lies between the river and Cooeeimbardi Road, which runs parallel to the trend of the river to link with the Esk-Kilcoy Road.

EXTRACTIVE RESOURCE: Sand and Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
An elevated alluvial terrace on the eastern (left) bank of the Brisbane River is underlain by up to 21 metres of alluvium. The uppermost 8 to 10 metres consist of sandy to silty clay overburden. Beneath this, the resource comprises an upper layer of fine to medium sand, underlain by variably clayey to clean fine to very coarse gravel, ranging between 12 metres to 15 metres in thickness. Clay layers up to 2 metres thick occur within the sand and gravel. The northern parts of the terrace are underlain by clay directly over rock, with no sand or gravel present.

A potential resource of 10 million cubic metres exists under the terrace, assuming a thickness of 10 metres.

SIGNIFICANCE:
There are substantial resources available and it is conveniently situated to supply the western Brisbane, Ipswich, Esk and Gatton Shires. It also contains sufficient material for several decades of supply to those markets at the projected rate of consumption.

SEPARATION AREA:
Owing to the generally level and cleared condition of the terrace, the full 200 metre separation distance is adopted around the entire perimeter of the resource. The resource availability is restricted by the buffer zone for Lake Wivenhoe reservoir. Therefore, the outer limit of the separation area is set at the boundary of the water reservoir.

TRANSPORT ROUTE:
The probable transport route will be through the 'Glen Arden' property onto the Cooeeimbardi Road, which leads to the Esk-Kilcoy Road to the south, and then onto the Brisbane Valley Highway to the west.

SPECIAL CONSIDERATIONS:
The KRA is located within the Wivenhoe Declared Catchment Area and contains land classified as good quality agricultural land (1994 Esk DPI Agricultural Land Classes Map; Brisbane Valley Area-Esk Sheet Land Suitability). The resource/processing area is adjacent to the Brisbane River and a minimum buffer width of 50 metres from the resource/processing area to the river has been established.

HARRIS TERRACE KEY RESOURCE AREA – KRA 75

LOCAL GOVERNMENT AREA: Esk Shire

LOCATION:
The resource is located on the western bank of the Brisbane River about 4 kilometres southeast of Fernvale near the eastern end of Harris Road **(**see map KRA 75**)**.

EXTRACTIVE RESOURCE: Sand and Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises part of an alluvial terrace and contains several million tonnes of sand and gravel beneath relatively thin overburden.

The area is currently unworked. An existing sand extraction operation is located on the opposite bank of the river.

SIGNIFICANCE:
The resource is sufficient to supply the western Brisbane, Ipswich, Esk and Gatton Shire markets for at least a decade at current rates of consumption.

SEPARATION AREA:
The full separation distance of 200 metres has been applied around the alluvial terrace containing the resource due to the absence of any intervening natural features to buffer quarry impacts.

TRANSPORT ROUTE:
The transport route would be along Harris Road onto the Brisbane Valley Highway.

SPECIAL CONSIDERATIONS:
The KRA contains land classified as good quality agricultural land (1994 Esk DPI Agricultural Land Classes Map). The resource/processing area is adjacent to the Brisbane River and a minimum buffer width of 50 metres from the resource/processing area to the river has been established.

SCHMIDT'S TERRACE KEY RESOURCE AREA – KRA 76

LOCAL GOVERNMENT AREA: Esk Shire

LOCATION:
The resource lies 2 kilometres north of Fernvale on the southern side of the Brisbane River (see map KRA 76).

EXTRACTIVE RESOURCE: Sand and Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
This resource comprises deposits underlying the lower and intermediate terraces south of the Brisbane River from near the Fernvale Bridge on the Brisbane Valley Highway to within a kilometre of the northern outskirts of Fernvale. Existing extractive licences cover the deposits under the lower terrace.

The resources below the intermediate terrace are estimated at 2.1 million tonnes.

SIGNIFICANCE:
The resource has the potential to supply the western Brisbane, Ipswich, Esk and Gatton Shire markets for at least two decades.

SEPARATION AREA:
The full separation distance of 200 metres has been applied around the sand and gravel resource due to the absence of any intervening natural features to buffer quarry impacts.

TRANSPORT ROUTE:
The transport route is partly along Powells Road and then through private property and then via an unnamed road for a short distance before entering the Brisbane Valley Highway.

SPECIAL CONSIDERATIONS:
The resource/processing area is adjacent to the Brisbane River and a minimum buffer width of 50 metres from the resource/processing area to the river has been established.

HILLS TERRACE KEY RESOURCE AREA – KRA 77

LOCAL GOVERNMENT AREA: Esk Shire and Ipswich City

LOCATION:
The resource is situated on the southern side of the Brisbane River about 6 kilometres southeast of Fernvale (see map KRA 77).

EXTRACTIVE RESOURCE: Sand and Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of a deposit of fine to coarse sand and gravel, which occurs in an alluvial terrace of the Brisbane River downstream of Fernvale. Potential resources of up to 5.5 million tonnes are indicated, which as yet are unworked.

SIGNIFICANCE:
The resource has the potential to supply the western Brisbane, Ipswich, Esk and Gatton Shire markets for several decades.

SEPARATION AREA:
The full separation distance of 200 metres has been applied around the identified resource boundary due to the absence of any intervening natural features to buffer quarry impacts.

TRANSPORT ROUTE:
The transport route utilises existing roads along Hills Road and Pine Mountain Road to the Brisbane Valley Highway.

SPECIAL CONSIDERATIONS:
The KRA contains land classified as good quality agricultural land (1994 Esk DPI Agricultural Land Classes Map). The resource/processing area is adjacent to the Brisbane River and a minimum buffer width of 50 metres from the resource/processing area to the river has been established.

WIRALEE KEY RESOURCE AREA – KRA 78

LOCAL GOVERNMENT AREA: Esk Shire

LOCATION:
The resource is located about 2 kilometres southwest of Toogoolawah on the southern side of Cressbrook Creek (see map KRA 78).

EXTRACTIVE RESOURCE: Sand and Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
A significant resource of sand and gravel occurs in the alluvial terrace of Cressbrook Creek between one and two kilometres upstream of Toogoolawah. The deposit lies below the intermediate terrace of Cressbrook Creek west of the Brisbane Valley Highway. Resources of 3.8 million tonnes are indicated, under relatively shallow overburden.

SIGNIFICANCE:
The resource is significant as it is strategically located to supply the western Brisbane, Ipswich, Esk and Gatton Shire markets. There may be prospects for transport to the South Burnett region and the Kilcoy and Caboolture Shires. It also contains sufficient material for several decades of supply.

SEPARATION AREA:
As there are no intervening natural features to buffer quarry impacts, a separation distance of 200 metres has been adopted around the resource as defined by drilling.

Thus the boundary of the separation area is along the eastern bank of Cressbrook Creek to the west and north, and encompasses rural land on the eastern and southern sides of the resource.

TRANSPORT ROUTE:
The most convenient transport route onto the Brisbane Valley Highway is through private land connecting onto Morden Road.

SPECIAL CONSIDERATIONS:
The KRA contains land classified as good quality agricultural land. The resource/processing area is adjacent to Cressbrook Creek and a minimum buffer width of 50 metres from the resource/processing area to the creek has been established.

MOUNT CROSS KEY RESOURCE AREA – KRA 79

LOCAL GOVERNMENT AREA: Gatton Shire

LOCATION:
The resource is located adjacent to Seventeen Mile Road about 16 kilometres northeast of Helidon (see map KRA 79).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The extractive resource consists of a deposit of greenstone, which occurs adjacent to Seventeen Mile Road northeast of Helidon. Only a limited proportion of the resource area has been investigated in detail to date but large resources are likely to be present. Testing indicates the rock to be suitable for good quality aggregates for the full range of applications from road bases, road sealing aggregates and concrete aggregates. The greenstone deposit has not been worked to date.

SIGNIFICANCE:
The resource is sufficiently large and of such quality that it represents a significant regional resource for the long-term future.

SEPARATION AREA:
The separation area is largely defined on the basis of a full separation distance of 1000 metres from the resource boundary. The separation distance has been reduced where intervening ridges or high relief allow a lesser distance from the resource boundary than the 1000 metres.

TRANSPORT ROUTE:
Seventeen Mile Road is already used to transport building stone from several sandstone quarries closer to Helidon onto the Warrego Highway at Helidon. The use of the part of the road north of the sandstone quarries for the transport of extractive materials would be consistent with this designation.

SPECIAL CONSIDERATIONS:
The KRA contains areas having State biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment and encompasses three cultural heritage sites of State significance. The Xanthorrhea Nature Refuge is adjacent to the western end of the resource/processing area. The KRA is adjacent to the Lockyer Forest Reserve.

The KRA contains land classified as good quality agricultural land (mostly Class C1 improved pastures, with small areas of Class B and Class D non agricultural land).

KHOLO SANDS KEY RESOURCE AREA – KRA 80

LOCAL GOVERNMENT AREA: Brisbane City and Ipswich City

LOCATION:
The resource is located upstream of the Kholo Bridge on the Brisbane River about 10 kilometres north of the Warrego Highway (see map KRA 80).

EXTRACTIVE RESOURCE: Sand, Soil, Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of fine to coarse grained sand and gravel beneath topsoil and loam overburden. It occupies over 30 hectares of an alluvial terrace of the Brisbane River. The resource is currently being worked.

SIGNIFICANCE:
The resource is capable of supplying the southwest Brisbane and Ipswich markets for concrete and bituminous aggregate for over 10 years, as well as for the topsoil and loam market.

SEPARATION AREA:
A separation distance of 200 metres from the resource boundary surrounds the resource to the north, east and south, as all land is within rural zoning. The separation area to the west is constrained to the western (right) bank of the Brisbane River.

TRANSPORT ROUTE:
Sand is transported southward along Kholo Road to the Warrego Highway.

SPECIAL CONSIDERATIONS:
The KRA is situated on the eastern side of the Brisbane River on Kholo Road. A minimum buffer width of 40 metres has been established from the resource/processing area to the river.

MOUNT MARROW KEY RESOURCE AREA – KRA 81

LOCAL GOVERNMENT AREA: Ipswich City

LOCATION:
The resource is located about 6 kilometres northeast of Rosewood (see map KRA 81).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
A thick sequence of hard basalt forms a prominent hill known as Mount Marrow northeast of Rosewood. This is the site of a large quarry producing a range of crushed aggregates.

SIGNIFICANCE:
The resource is sufficient for many decades of supply at the present rate of consumption. It is conveniently situated to supply the western Brisbane and Ipswich urban markets and surrounding districts.

SEPARATION AREA:
A 1000 metre separation distance has been adopted around the Mount Marrow basalt quarry, as the hill stands higher than any surrounding topography. This has been expanded on the eastern side because of the high visibility on the eastern flank and a previous Planning and Environment Court decision, which affirmed the need for a greater (2000 metre) buffer in this area.

TRANSPORT ROUTE:
Two transport routes extend in opposite directions along the Mount Marrow Quarry Road. The southern route leads to the Thagoona-Haigslea Road onto Caledonian Road, which reaches the Karrabin-Rosewood Road, while the northern route leads to the Haigslea-Malabar Road and thence to the Warrego Highway.

PURGA KEY RESOURCE AREA – KRA 82

LOCAL GOVERNMENT AREA: Ipswich City

LOCATION:
The resource is located east of the Boonah Road about 4 kilometres northeast of Peak Crossing. It is about 18 kilometres south of Ipswich (see map KRA 82).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of a thick steeply dipping sill of fine dark grey basalt, which is underlain by weathered sandstone. It forms a prominent conical hill in which a moderate sized quarry has been established largely on the western side.

SIGNIFICANCE:
The resource provides a substantial proportion of the aggregate production for the Ipswich and Fassifern Valley districts. There are sufficient resources for over ten years supply.

SEPARATION AREA:
The full 1000 metre separation distance has been adopted around most of the resource/processing area as the resource is topographically higher than the surrounding land. The separation area has been slightly truncated in the west where the boundary is defined as the Ipswich-Boonah Road.

TRANSPORT ROUTE:
The transport route is along T. Morrows Road to the Ipswich-Boonah Road. The majority of the rock is transported to Ipswich to the north, but some is transported to rural markets elsewhere.

SUMMERVILLE AND SAPLING POCKET KEY RESOURCE AREA – KRA 83

LOCAL GOVERNMENT AREA: Esk Shire (Summerville) and Ipswich City (Sapling Pocket)

LOCATION:
The resource comprises two sections of the alluvial terrace to the west and south of the Brisbane River, known as Summerville and Sapling Pocket respectively **(**see map KRA 83). The resource is located about 8 kilometres southeast of Fernvale**.**

EXTRACTIVE RESOURCE: Sand and Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
The sand and gravel resources in both deposits underlie the second lowest alluvial terrace.

Both deposits are currently worked.

SIGNIFICANCE:
The resource is sufficient to supply the western Brisbane, Ipswich, Esk and Gatton Shire markets for the next decade. Current production levels account for more than ten per cent of the southern and western Brisbane consumption.

SEPARATION AREA:
A separation distance of 200 metres has been applied around the resource extent on the northern, eastern and western sides. The separation area to the south of the Summerville's resource area is set to the southern bank of the Brisbane River where a high cliff screens the resource from land south of the river.

TRANSPORT ROUTE:
The transport route is via Russell Road and onto Pine Mountain Road directly southwards to the Warrego Highway at the Muirlea intersection.

MARBANGO KEY RESOURCE AREA – KRA 84

LOCAL GOVERNMENT AREA: Booringa Shire

LOCATION:
The resource lies immediately north of the Warrego Highway about 5 kilometres west of Amby and about 65 kilometres west of Roma (see map KRA 84**)**.

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource is located near the southern end of an extensive belt of basalt flows that extends for many kilometres northward from the Warrego Highway. Where the resource is being worked, the basalt varies from 12 to 17 metres thick. Overburden depth is variable. It is mostly less than 3 metres but exceeds 10 metres in places.

SIGNIFICANCE:
The resource is expected to be sufficient for twenty years. The resource has provided the majority of various rock products to the Bendemere, Booringa, Bungil, Murweh, and Balonne Shires. Products have been transported as far as Blackall, Goondiwindi, Jericho, St George and Quilpie.

SEPARATION AREA:
The resource is effectively defined by the extent of the basalt within the boundaries of the property currently leased by the quarry operator. The quarry operation is visually screened from the surrounding rural land by its position on the ridge. However, as this provides only limited shielding of other quarry-related impacts, the separation distance is set at the full 1000 metres from the resource/processing area.

TRANSPORT ROUTE:
The transport route is through private land onto the Warrego Highway.

SPECIAL CONSIDERATIONS:
The KRA resource/processing area is covered by 'of concern' vegetation under the *Vegetation Management Act 1999*. This is within the currently approved area.

WARRIAN KEY RESOURCE AREA – KRA 85

LOCAL GOVERNMENT AREA: Bungil Shire

LOCATION:
The resource is located about 35 kilometres north of Roma via the Roma – Taroom Road (see map KRA 85**).**

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises basalt that forms a low flat-topped hill with gently sloping flanks. The basalt in the current working faces of the quarry is mostly fresh and it appears that the basalt intrudes the surrounding sedimentary rocks.

SIGNIFICANCE:
Warrian quarry is operated intermittently to supply material for major roadwork contracts. It has provided a significant proportion of various rock products to the Bendemere, Bungil, Murweh, and Balonne Shires. It also has the potential to supply materials to the Taroom Shire. The expected resource life is greater than 15 years.

SEPARATION AREA:
The current quarry is largely screened from the surrounding area by the rim of the hill currently retained for this purpose. The outer boundary of the separation area is set at the full 1000 metres from the resource boundary to allow for effective separation after removal of the rim, which forms part of the resource.

TRANSPORT ROUTE:
The materials are transported through private land onto the Roma – Taroom Road to the west.

BARGARA KEY RESOURCE AREA – KRA 86

LOCAL GOVERNMENT AREA: Burnett Shire

LOCATION:
The resource is located on Back Windermere Road, about 5 kilometres south of Bargara (see map KRA 86).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource is within basalt that underlies the coastal plain between Burnett Heads and Elliott Heads.

An existing quarry supplies a range of aggregates and road base products.

SIGNIFICANCE:
The resource supports production of a considerable proportion of the quarry materials consumed in Bundaberg City and the surrounding districts. It is likely to be sufficient for another 15 years of supply.

There is only one other rock resource of comparable size within 30 kilometres of Bundaberg. This is located about 3 kilometres to the south along Back Windermere Road.

SEPARATION AREA:
The boundaries of the separation area to the north and east are constrained by the boundaries of Future Urban or Urban zoned land. The separation area extends 500 metres west of Back Windermere Road over the land zoned as Rural, as this area is partly buffered by the topography. However, in the southwest, the small lots north of Innes Park Road around Tara Street are excluded from the separation area.

The full separation distance of 1000 metres is adopted on the southern side of the resource, including the Rural blocks between Cockerills Road and Innes Park Road.

TRANSPORT ROUTE:
The transport route is directly onto Cockerills Road thence onto Back Windermere Road. Some quarry product is transported north and west along Back Windermere Road and Windermere Road to the State-controlled Bundaberg Port Road (Walker Street), while the remainder is transported south along Back Windermere Road to the State-controlled Innes Park Road.

INNES PARK KEY RESOURCE AREA – KRA 87

LOCAL GOVERNMENT AREA: Burnett Shire

LOCATION:
The resource is located on Back Windermere Road, about 8 kilometres south of Bargara (see map KRA 87).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises part of the basalt that underlies the coastal plain between Burnett Heads and Elliott Heads.

An existing quarry supplies aggregates to a concrete batching plant in Bundaberg. A small proportion of the material is sold to other customers.

SIGNIFICANCE:
The remaining resource is sufficient for over 30 years of supply. The resource supplies a large proportion of the aggregates for the Bundaberg district.

SEPARATION AREA:
North and northwest of the resource/processing area, the separation area excludes the Residential C zoned land west of Back Windemere Road and the Residential A zoned land on the southern side of Innes Park Road. The flat country to the east of the resource is zoned Future Urban. This is partly shielded by a bund wall constructed along the perimeter of the extractive operations, allowing a reduction in separation distance to 500 metres. The Special Facilities zone, however, is excluded from this part of the separation area.

The separation area boundary has been defined at 500 metres from quarry operations over the Rural and Future Urban land south and west of the existing quarry, as these areas are also partly shielded by the bund wall.

TRANSPORT ROUTE:
From the quarry entrance on Back Windermere Road, most quarry product is transported north to the State-controlled Innes Park Road. Some product is hauled south via Barolin Homestead Road to Elliott Heads Road.

MEADVALE KEY RESOURCE AREA – KRA 88

LOCAL GOVERNMENT AREA: Cooloola Shire

LOCATION:
The resource is situated at Meadvale railway siding 13 kilometres south of Gympie on the North Coast Line (see map KRA 88).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of a hill of porphyritic rhyolite, believed to be an intrusive plug.

The resource is currently owned by Queensland Rail and has been partially worked for ballast and armour rock for the upgrade of the North Coast railway line.

SIGNIFICANCE:
The resource is the closest available hard rock to Gympie and the developing areas surrounding the city. The resource size is significant but not well-defined. However, there are no other significant hardrock resources within 40 kilometres of Gympie. It is also strategically located as a source of maintenance materials for the railway.

SEPARATION AREA:
The western boundary of the separation area is 500 metres west of the resource where a ridge provides partial shielding from the impacts of quarry operations. The boundary for the remainder of the separation area is set at the full 1000 metres from the nearest part of the resource/processing area, as the surrounding land is lower and potentially more exposed to quarry-related impacts.

TRANSPORT ROUTE:
The transport route is northwards along the original North Coast railway easement to Woondum Road, then westwards along Woondum Road to the Bruce Highway, about 8 kilometres south of Gympie.

MOY POCKET KEY RESOURCE AREA – KRA 89

LOCAL GOVERNMENT AREA: Cooloola Shire

LOCATION:
The resource lies west of the Mary River at Moy Pocket, 35 kilometres south of Gympie via the Gympie to Kenilworth road to Brooloo, and thence via Moy Pocket Road (see map KRA 89).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The main part of the resource comprises trachyandesitic intrusive rocks. This rock unit underlies an area between Moy Pocket Road in the east and the foot of the Kenilworth Bluff in the west. A large quarry is currently working the resource. The trachyandesite is at least 60 metres deep below the present quarry floor. Additional products such as low grade road bases are obtained from hardened mudstone near the northwestern end of the current extractive licence area.

SIGNIFICANCE:
The resource supplies a major proportion of the demand for road base, aggregate, and armour rock in the Cooloola and Maroochy Shires. Products are also supplied to the Noosa Shire. The trachyandesite is preferred over other rock types available in those Shires for asphalt screenings for road surfacing.

SEPARATION AREA:
The separation distance is set 1000 metres from the southwestern edge of the resource, extending over the eastern slopes of Kenilworth Bluff. The southeastern ridge of the quarry will be retained as a visual barrier to the Mary River valley, allowing the separation distance in this area to be 500 metres from the resource/processing area.

A separation distance of 1000 metres has been adopted from the existing quarry face over the Rural-zoned land adjacent to the northeastern boundary of the resource. On the northwestern side, the separation area boundary is established at 1000 metres from the trachyandesite part of the resource. This will also provide 500 metres of separation from the mudstone area currently being worked by ripping.

TRANSPORT ROUTE:
From the quarry entrance on Moy Pocket Road, products are transported both north along Moy Pocket Road to the State-controlled Kenilworth – Brooloo Road, and south along Moy Pocket Road to the Eumundi – Kenilworth Road, and then east to the Bruce Highway.

SPECIAL CONSIDERATIONS:
The KRA contains areas having State biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment and may also contain cultural heritage values. Small areas of 'of concern' vegetation under the *Vegetation Management Act 1999* occur on the edges of the current approval area.

DUNDOWRAN KEY RESOURCE AREA – KRA 90

LOCAL GOVERNMENT AREA: Hervey Bay City

LOCATION:
The resource is located at Dundowran, about 9 kilometres west of Pialba (see map KRA 90).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The Dundowran resource comprises basalt in one of a series hills that trends northeast between Takura and Dundowran. The Dundowran West resource (KRA 91) spans two similar basalt hills, about 2 kilometres to the southwest.

At the Dundowran resource, an existing quarry produces concrete aggregate, road screenings and road base materials.

SIGNIFICANCE:
The resource, which is about 30 kilometres by road from Maryborough, is conveniently situated to supply the Hervey Bay urban area and the broader Wide Bay market. The existing quarry meets about half of the regional demand. The resource is sufficient for between 25 and 30 years production at the current rate.

SEPARATION AREA:
On the northwestern and northern sides of the resource, a separation distance of 500 metres has been adopted due to partial shielding by a ridge along the northern side of the resource. Where houses or urban subdivisions already exist, these have been excluded from the separation area, reducing it to as little as 200 metres wide. To the east of the resource, topographic shielding is absent and a separation distance of 1000 metres is required.

On the southeastern side of the resource, the width of the separation area is limited by the existing Rural Residential zoned area. In the southwest, the separation area extends to cover the Dundowran West resource.

TRANSPORT ROUTE:
The main transport route into Hervey Bay is via Lower Mountain Road and Dundowran Road to the Pialba – Burrum Heads Road. Some product is also transported south via Purser Road and Hornes Road to the State-controlled Torbanlea – Pialba Road.

DUNDOWRAN WEST KEY RESOURCE AREA – KRA 91

LOCAL GOVERNMENT AREA: Hervey Bay City

LOCATION:
The resource is located south of Dundowran, about 11 kilometres west-southwest of Pialba (see map KRA 91).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises basalt that forms two hills in the central part of a northeast-trending line of similar basalt hills between Takura and Dundowran.

An existing quarry in the northern hill produces a wide range of crushed rock products. The southern hill is also owned by a quarrying company.

SIGNIFICANCE:
The existing quarry meets a considerable proportion of the demand for aggregates in the Hervey Bay and Maryborough districts. The estimated resource life exceeds 20 years at the current production rate.

SEPARATION AREA:
The separation area boundary on the western side of the Key Resource Area extends to 500 metres from the processing area. To the south and east, topographic shielding has allowed the separation area to be reduced in width to 500 metres. To the north of the resource/processing area, the separation area links with the separation area for the Dundowran Key Resource Area (KRA 90).

TRANSPORT ROUTE:
Quarry products are transported south to the Torbanlea – Pialba Road via Hornes Road, which is presently unsealed, or north via Hornes Road and Purser Road to the sealed Lower Mountain Road, and from there via Dundowran Road to the Pialba – Burrum Heads Road.

RED RIDGE KEY RESOURCE AREA – KRA 92

LOCAL GOVERNMENT AREA: Isis Shire

LOCATION:
The resource is located near the Goodwood Road, about 12 kilometres east of Childers (see map KRA 92).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource is an isolated occurrence of basalt that forms a low hill south of the Gregory River crossing on the Goodwood Road. Surface indications of basalt extend for a kilometre to the northeast of the existing pit. The thickness of the basalt is unknown.

SIGNIFICANCE:
An existing quarry in the resource is a major supplier of quarry products to the Bundaberg district, the Isis Shire and Hervey Bay City. Supply from this resource is expected to increase in future as hardrock resources in the surrounding district, especially the Burnett Shire, are exhausted. Resources in the present quarry are sufficient for over 10 years supply at current production rates. The resource life for the whole deposit is estimated at more than 50 years.

SEPARATION AREA:
A separation distance of 1000 metres is required to the south, east and north of the resource/processing area where the existing landform provides no effective screening of future quarry impacts.

A separation distance of approximately 500 metres has been adopted along the western boundary where an intervening low ridge will provide partial shielding of quarry-related impacts.

TRANSPORT ROUTE:
Materials are transported over an unpaved road through land owned by the quarry operator directly onto the State-controlled Goodwood Road to the east.

HODGLEIGH KEY RESOURCE AREA – KRA 93

LOCAL GOVERNMENT AREA: Nanango Shire

LOCATION:
The resource is located on the northern side of the D'Aguilar Highway near Hodgleigh, approximately 7 kilometres northwest of Nanango (see map KRA 93).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises quartzite, mudstone and greywacke, which form a prominent ridge northwest of Barker Creek. The rocks have been hornfelsed (metamorphosed) by a nearby large granitic intrusion.

A major quarry is located on the southern end of the resource.

SIGNIFICANCE:
The remaining resource is sufficient for at least another 10 years production. The resource is conveniently situated to supply a wide range of quarry products to a market extending throughout the South Burnett region.

SEPARATION AREA:
The separation distance is set at 500 metres from the western edge of the resource/processing area, as intervening ridges partly shield the resource on this side. A width of 1000 metres is required for the remainder of the separation area as no similar topographic screening exists.

A small area of Future Urban zoned land west of the resource has been excluded from the separation area.

TRANSPORT ROUTE:
The transport route is directly onto Hodgleigh North Road and thence onto the D'Aguilar Highway.

CLUTHA CREEK SANDS KEY RESOURCE AREA – KRA 94

LOCAL GOVERNMENT AREA: Beaudesert Shire

LOCATION:
The resource is located on the north side of Clutha Creek, about 3.5 kilometres north of Tamborine Village. It is bordered by Clutha Creek Road to the south and the Waterford-Tamborine Road to the east (see map KRA 94).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resource, which covers an area of about 100 hectares, comprises colluvium and weathered sandstone. An existing operation based on ripping, washing and cyclone separation produces graded sand products.

SIGNIFICANCE:
The resource is sufficient for 20 to 30 years of supply. The resource currently supplies a market area extending from the south side Brisbane to the Gold Coast. It is one of only a few sand supply sites south of Brisbane.

SEPARATION AREA:
The separation distance of 200 metres has been applied around the resource, with 40 metres of this being an internal setback. To the west, south and east, the separation area covers mainly Rural zoned land. To the north, the separation area extends 160 metres into lots that are zoned Rural Residential A, as any further intensification of development in this area would be inconsistent with extraction of the resource.

TRANSPORT ROUTE:
The transport route is via Clutha Creek Road eastward to the State-controlled Waterford-Tamborine Road.

SPECIAL CONSIDERATIONS:
A small area of 'of concern' vegetation under the *Vegetation Management Act 1999,* located in the northwestern corner of the resource/processing area, is covered by a current extractive industry approval.

MUNDOOLUN CONNECTION SANDS KEY RESOURCE AREA – KRA 95

LOCAL GOVERNMENT AREA: Beaudesert Shire

LOCATION:
The resource occurs about 4 kilometres south-southeast of Tamborine Village, on the western slopes of the Tamborine Plateau. Access is via the Mundoolun Connection Road, 2 kilometres south of the intersection with the Beaudesert-Beenleigh Road (see map KRA 95).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resource comprises colluvium and weathered sandstone and covers about 600 hectares. An operation based on ripping, washing and cyclone separation produces graded sand products.

SIGNIFICANCE:
The resource is likely to be sufficient for over 50 years of supply. The resource is of regional significance and would be able to meet a large proportion of supply requirements in the markets on Brisbane's south side and the Gold Coast. It is one of only a few supply sites south of Brisbane.

SEPARATION AREA:
The full 200 metre separation distance has been applied around the resource area.

TRANSPORT ROUTE:
The transport route is directly onto the State-controlled Mundoolun Connection Road.

SPECIAL CONSIDERATIONS:
The KRA contains areas of vegetation having regional biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment. There has been an unconfirmed siting of the Richmond birdwing butterfly in the northwestern portion of the KRA, which is listed as vulnerable under the *Nature Conservation (Wildlife) Regulation 1994*.

Some areas of 'of concern' vegetation under the *Vegetation Management Act 1999* have been protected under the current approval.

REEDY CREEK KEY RESOURCE AREA – KRA 96

LOCAL GOVERNMENT AREA: Gold Coast City

LOCATION:
The resource is located about 5.5 kilometres southwest of Burleigh and west of the Pacific Highway (see map KRA 96).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource is part of a major greywacke band and comprises an isolated hill that is surrounded by ridges. The resource has been investigated by drilling that has confirmed the quality and consistency of the greywacke.

SIGNIFICANCE:
Investigations indicate a large resource, sufficient for over 20 years of supply depending on the final pit footprint and depth. The resource is the largest known greenfield resource in the southern part of Gold Coast City, and is strategically located in relation to the Gold Coast market.

SEPARATION AREA:
The parcel on which the resource occurs is large enough and has the topographic features to almost completely self-buffer the resource, providing a separation distance of between 300 and 500 metres. Given the topographic screening provided by perimeter ridges, this distance should be sufficient to mitigate adverse impacts.

In the north, the separation area meets the boundary of the West Burleigh Key Resource Area (KRA 70).

TRANSPORT ROUTE:
A transport route has been proposed from the northern section of the resource to the Pacific Highway via the Bermuda Street interchange. An alternative route along the Old Coach Road has also been proposed.

SPECIAL CONSIDERATIONS:
The KRA contains areas of vegetation having State biodiversity significance under the Environmental Protection Agency's Biodiversity Planning Assessment and forms part of the Burleigh Heads – Great Dividing Range bioregional wildlife corridor. The KRA also encompasses several cultural heritage sites of State significance.

A small area of 'endangered' vegetation under the *Vegetation Management Act 1999,* located within the resource/processing area, would be protected by approval conditions in the case of a development application proceeding.

TANTITHA KEY RESOURCE AREA – KRA 97

LOCAL GOVERNMENT AREA: Burnett Shire

LOCATION:
The resource is located about 3 kilometres north of Bundaberg. It lies to the east of and parallel to Gooburrum Road, and extends from Colvins Road in the south to Hills Road in the north (see map KRA 97).

EXTRACTIVE RESOURCE: Sand

EXTRACTIVE RESOURCE DESCRIPTION:
The resource is part of a coastal dune system that underlies the gently undulating coastal plain between Bundaberg and Moore Park. The sand averages three metres thick and overlies other coastal sediments and older weathered rocks.

Several small extractive operations have utilised parts of this resource for over 20 years.

SIGNIFICANCE:
The resource contains about 50 million tonnes of sand and is estimated to be sufficient to supply the regional demand for over 35 years. It is also the nearest major sand resource to service the Bundaberg and Wide Bay market areas.

SEPARATION AREA:
The resource/processing area boundary has generally been defined to ensure that a separation distance of 200 metres can be established on all sides. However, no separation area can be defined at the southeastern end of the resource where Rural Residential lots occur immediately adjacent to an existing sand extraction site.

TRANSPORT ROUTE:
Materials are currently transported by Colvins Road into Tantitha Road, then via Gooburrum Road to the State-controlled Moore Park Road.

Alternative transport routes from the northern part of the resource are southward along Gooburrum Road to Moore Park Road, or from Hills Road via Gooburrum Road and Zahns Road to Moore Park Road.

SPECIAL CONSIDERATIONS:
The resource area is located within the Bundaberg (Declared) Sub-artesian area and is characterised by shallow groundwater. A wildlife corridor in 'not of concern' vegetation could pose a constraint to development along the southern edge of the resource area.

PEAK HILL KEY RESOURCE AREA – KRA 98

LOCAL GOVERNMENT AREA: Rockhampton City

LOCATION:
The resource is 8 kilometres north of Rockhampton on the Rockhampton to Yeppoon road (see map KRA 98).

EXTRACTIVE RESOURCE: Quarry Rock

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consist of andesitic tuff and a small diorite and gabbro intrusion which form two northwesterly trending ridges to the north of Norman Gardens on the northern outskirts of Rockhampton. An operating quarry is sited on the resource. The resource extent has been outlined on the basis of the area zoned as Extractive Industry on the Rockhampton City planning scheme.

SIGNIFICANCE:
The existing operation produces a considerable proportion of the hard rock consumed in Rockhampton City and Livingstone Shire. The resource is sufficient to continue for over twenty years at its present rate of production.

SEPARATION AREA:
As the resource is surrounded by higher ridges to the north, east, and southeast, the separation area adopted in those areas extends to the first high ridge, a distance of approximately 500 metres. In this sector the separation area includes the Yeppoon Road and Berserker Range Environmental Areas.

In the remainder, the variable separation distance is set by the Norman Road Slope Constraint Area boundary that controls the permissible extent of urban development on the basis of slope, and is as narrow as 100 metres where subdivision has extended up to the slope boundary.

TRANSPORT ROUTE:
The material is transported via the Rockhampton – Yeppoon Road which passes through the separation area.

BLADENSBURG KEY RESOURCE AREA – KRA 99

LOCAL GOVERNMENT AREA: Winton Shire

LOCATION:
The resource is located about 11 kilometres south of Winton (see Map KRA 99).

EXTRACTIVE RESOURCE: Gravel

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of a surface layer of clayey alluvium, overlying a sequence of clayey sands and gravels, forming ancient stream deposits and channel infill. The resource has an area of approximately 720 hectares.

SIGNIFICANCE:
The resource is on a reserve that is held by Main Roads as Trustee and has reserves estimated sufficient for more than 50 years supply. All other areas of available gravel of this standard have been exhausted for at least 50 kilometres in each direction along the state controlled roads. It is the only source in the region able to meet specifications available for use in the construction and maintenance of the National Highway and Kennedy Developmental roads.

SEPARATION AREA:
The separation distance of 200 metres is adopted around the perimeter of the resource. This includes portion of the Bladensburg National Park, which abuts all but the resource boundary in the north, which is abutted by the Winton Town Common, used for grazing stock.

TRANSPORT ROUTE:
Materials are transported along the unsealed Route of the River Red Gums Road to the Winton – Jundah Road then onto the Landsborough Highway in Winton.

WINDERMERE KEY RESOURCE AREA – KRA 100

LOCAL GOVERNMENT AREA: Winton Shire

LOCATION:
The resource occurs about 11 kilometres south of Winton (see map KRA 100).

EXTRACTIVE RESOURCE: Soil

EXTRACTIVE RESOURCE DESCRIPTION:
The resource consists of a surface layer fine grained silty sand (loam), overlying a thick sequence of clayey alluvium. The loam is an important source of binder material for admixture with the gravel from the Bladensburg deposit. The material represents old river and floodplain deposits.

SIGNIFICANCE:
The resource is on a reserve that is held by Main Roads as Trustee and has reserves estimated to be sufficient for more than 20 years supply. All other areas of loam suitable for blending with the gravel from the Bladensburg resource have been exhausted for at least 70 kilometres in each direction along the state controlled roads. It is the only source available for use in the construction & maintenance of the National Highway and Kennedy Developmental roads.

SEPARATION AREA:
A separation distance of 200 metres has been adopted around the perimeter of the resource. The resource is bounded on the southern side by the Winton Town Common which is currently used for grazing stock. The remainder of the surrounding land is zoned as Rural.

TRANSPORT ROUTE:
Materials are transported via an unsealed road to the Winton – Jundah Road and then onto the Landsborough Highway in Winton.

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