NSW GOVERNMENT
Department of Planning

MAJOR PROJECT ASSESSMENT: Gunlake Quarry

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

September 2008

Published September 2008
NSW Department of Planning
www.planning.nsw.gov.au

Cover photograph of Gunlake quarry site courtesy of Gunlake Quarries

EXECUTIVE SUMMARY

Gunlake Quarries (Gunlake) propose to construct and operate a hard rock quarry on a rural property approximately eight kilometres north west of Marulan, 30 km east of Goulburn and about 160 km south west of Sydney.

The majority of the 230 hectare (ha) property is undulating cleared pasture with small areas of remnant native vegetation on steeper slopes and along watercourses. The quarry site would occupy approximately 15 ha of the property, comprising a 6 ha pit and the remainder used for processing, stockpiles and ancillary purposes, the quarry access road and irrigation land. The project involves:

- extraction and processing of up to 500,000 tonnes of hard rock aggregates and manufactured sand per year for up to 30 years;
- transporting the material to the market, primarily to Gunlake's concrete plants in Sydney (initially at Smeaton Grange and Blacktown);
- upgrading of existing roads and construction of a new road and intersection for quarry material transport; and
- progressively rehabilitating and revegetating the site.

The proposal constitutes a 'major project' under Part 3A of the *Environmental Planning and Assessment Act 1979* and consequently the Minister is the approval authority for the project.

Following public exhibition, the Department received 28 submissions on the project – 6 from public authorities and 22 from private individuals or organisations. None of the public authority submissions objected to the project. The majority of the remaining submissions objected to the project citing noise, air quality, traffic safety and hours of operation. The key issues considered during the assessment include traffic and transport, noise, air quality, water, flora and fauna. Measures to mitigate environmental impacts include:

- the transportation of quarry products in two stages:
  - Stage 1 with an average of 25 truck movements per day (and peak of 38 movements) for 3-5 years following the commencement of quarrying; and
  - Stage 2 with 100 truck movements per day for the remaining 25-27 year life of the approval;
- constructing an overburden emplacement bund to visually and acoustically screen the quarry and processing area from residences to the east;
- sealing the access road,
- constructing a bypass road to remove the majority of trucks from Marulan during the second stage of product transportation;
- upgrading local roads including widening transport roads to 7m and reconstructing the intersections of Red Hills Road and the Hume Highway, and George Street and Brayton Road,
- rehabilitating the site following completion; and
- providing an offset package to compensate for the removal of native vegetation.

Gunlake has amended the proposal to restrict truck movements during Stage 1 product transportation to the daytime period only, to minimise impacts on residences along Brayton Road and in the town of Marulan. Gunlake has also reduced the area of native vegetation to be cleared and increased the area of land to be conserved and/or regenerated with native vegetation, as compensatory habitat.

The Department has assessed the project application and accompanying environmental assessment, submissions received and Gunlake's response to submissions, and is satisfied that there is sufficient information available to determine the application.

The Sydney – Canberra Corridor Regional Strategy recognises that extractive resources in the Goulburn Mulwaree local government area have the potential to provide Sydney with a long term supply of construction materials, particularly hard rock. The proposed Gunlake quarry project is consistent with the Regional Strategy as it would provide the Sydney market with a long term supply of construction material that is located close to a major transport corridor, the Hume Highway.

The Department recommends approval of the project, subject to recommended conditions which address quarrying operations, on-going environmental monitoring and management, rehabilitation, compliance mechanisms, independent reviews and performance audits.

1 PROPOSED PROJECT

Gunlake Quarries (Gunlake) has identified a significant hard rock resource (approximately 180 million tonnes) within a rural property approximately 8 km northwest of Marulan, 30 km east of Goulburn and about 160 km south west of Sydney (see Figure 1 below).

The majority of the 230 hectare (ha) property is undulating cleared pasture with small areas of remnant native vegetation on steeper slopes and along watercourses. The quarry site would occupy approximately 15 ha of the property, comprising a 6 ha pit and the remainder used for processing, stockpiles and ancillary purposes, the quarry access road and irrigation land.

Figure 1: *Location Map*

1.1 Project Setting

The Marulan area comprises mainly rural and rural-residential properties, with livestock grazing the predominant rural use. There are 4 residences within 1.4 km of the proposed quarry processing area, with the nearest residence approximately 0.7 km to the east.

A number of quarries currently operate in the area surrounding the proposed Gunlake quarry. Cemex's Johnniefelds quarry and Lynwood quarry are located 2 km to the east and south, respectively. Boral's Marulan South quarry and Blue Circle Southern Cement's limestone mine are both located to the south of the Hume Highway, at Marulan South.

Figure 2 – Local Setting

Goulburn Mulwaree Council has approved a number of rural residential and hobby farm subdivisions in the Marulan area. These include a rural residential subdivision to the south of the project site and west of Brayton Road (Merino Road subdivision) and rural lots (40 ha hobby farm lots) located on the adjoining Lockyersleigh property to the south west and a property to the north east (off Canyonleigh Road) of the project site.

1.2 Proposed Project

Gunlake propose to construct and operate a hard rock quarry north of Marulan, in the Goulburn mulwaree local government area.

The key components of the proposal are set out in Table 1 and shown in Figure 3 on the following pages.

Table 1: Key Components of the Project

Proposed Components	***Description***
Summary	**Construction and operation of a hard rock quarry north of Marulan, including:** • **extraction and processing of up to 500,000 tonnes of hard rock aggregates and manufactured sand per year for up to 30 years;** • **transporting the material to the market, primarily to Gunlake's concrete plants in Sydney (initially at Smeaton Grange and Blacktown);** • **upgrading of existing roads and construction of a new road and intersection for quarry material transport; and** • **progressively rehabilitating and revegetating the site.**
Total Property Area	230 hectares
Project Site Area	15 hectares
Quarry area	6 hectares
Reserves	Approximately 180 million tonnes of extractable reserves are present.
Excavation Method	Open Cut. Rock would to be loosened by drilling and blasting to 13m depth and then loaded to a dump truck for delivery to the processing plant.
Processing	Extracted rock would be delivered to a three stage processing plant. The quarry would produce a range of products – concrete and sealing aggregates, road base, rail ballast and manufactured sand.
Access	Access from the site to the Hume Highway would occur in two stages. **Stage 1** - trucks would leave the Project Site and travel along Brayton Road towards the Marulan Interchange (and through the township of Marulan). **Stage 2** - would involve construction of a road bypassing Marulan for northbound trucks leaving the quarry and all trucks returning to the quarry. Southbound trucks leaving the quarry would continue to use existing roads through Marulan.
Loading and Transport	Truck movements under Stage 1 product transportation would average 25 truck movements per day (peak of 38 movements), increasing to 100 truck movements per day during Stage 2.
Transport Route Improvements	Prior to Stage 1 transportation commencing, Gunlake would upgrade Brayton Road between the quarry access road and Johnniefelds quarry entrance to a 7 metre wide sealed road. Prior to Stage 2 transportation commencing Gunlake would: • construct a new road between Brayton Road and Red Hills Road to bypass Marulan; • upgrade Red Hills Road to a 7 metre wide sealed road where required; and • construct new intersections at Brayton Road and the bypass road, and Red Hills Road and the Hume Highway, and a roundabout at the intersection of Brayton Road and George Street
Hours of Operation	**Stage 1** – 6:00am to 7:00pm Monday to Friday, and 7.00am to 1.00pm on Saturday. **Stage 2** – Quarrying and processing between 6.00am to 7.00pm Monday to Saturday. Loading/dispatch/product transportation 24-hours per day between 2.00am Monday and 6:00pm Saturday.
Employment	10 construction personnel 20 full time on-site personnel and 25 truck drivers.
Rehabilitation	At the completion of 30 years of quarrying significant hard rock reserves would still be present. Should quarrying not continue, then the site would be rehabilitated. In the short term the objective would be to stabilise all earthworks, drainage lines and disturbed areas to minimise erosion and reduce the visibility. In the longer term the rehabilitation objectives are to provide a low maintenance, stable and safe landform, blend the created landforms (emplacement area and quarry pit) with the surrounding land, and revegetate with native species and/or pasture. The bypass road would be dedicated to Council as a public road.
Offset Strategy	The offset strategy includes the retention and management of 3 areas including 30.38 hectares of existing vegetation and the regeneration of 46.16 hectares of cleared land.

Figure 3 - Project Site Layout

2 STATUTORY CONTEXT

2.1 Major Project

The proposal is classified as a major project under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), because it meets the criteria in clause 7(1)(a) of Schedule 1 of *State Environmental Planning Policy (Major Projects) 2005,* being development for the purpose of an extractive industry that extracts more than 200,000 tonnes of extractive material per year.

Consequently, the Minister for Planning is the approval authority for the project.

2.2 Permissibility

The project is located in an area zoned 1(a) Rural under the *Mulwaree Local Environmental Plan 1995* (LEP). The bypass road is located on land zoned 1(a) Rural under the LEP. The proposal is wholly permissible with development consent in this zone and consequently may be approved by the Minister as a major project under Part 3A.

2.3 Exhibition

Under section 75H(3) of the EP&A Act, the Director-General is required to make the environmental assessment (EA) of a project publicly available for at least 30 days.

After accepting the EA for the project, the Department:

- made it publicly available from Wednesday 5 March 2008 until Wednesday 9 April 2008:
  - via a link on the Department's website;
  - at the Department's Information Centre in Sydney;
  - at the Goulburn Mulwaree Council in Goulburn;
  - at the Marulan Post Office in Marulan; and
  - at the Nature Conservation Council in Sydney;
- notified relevant public authorities and Goulburn Mulwaree Council by letter; and
- advertised the exhibition of the EA in the Goulburn Post.

This satisfies the requirements in section 75H(3) of the EP&A Act.

2.4 Objects of the EP&A Act

The Minister's consideration and determination of the application must be consistent with the relevant provisions of the EP&A Act, including the objects set out in section 5 of the Act. The objects of most relevance to the Minister's decision on whether or not to approve the project are found in section 5(a)(i), (ii), (vi)& (vii). They are:

> *"The objects of this Act are:*
> *(a) to encourage:*
> *(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
> *(ii) the promotion and co-ordination of the orderly and economic use and development of land,*
> *(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
> *(vii) ecologically sustainable development"*

The Department has fully considered the objects of the EP&A Act, including the encouragement of Ecologically Sustainable Development (ESD), in its assessment of the project. The assessment integrates all significant economic and environmental considerations and seeks to avoid any potential serious or irreversible damage to the social environment, based on an assessment of risk-weighted

consequences. Gunlake has also considered a number of alternatives to the proposed development, including the alternative of not proceeding, and considered the proposal in the light of the ESD principles.

2.5 Environmental Planning Instruments

Under section 75I of the EP&A Act, the Director-General's report is required to include a copy of, or reference to, the provisions of any State Environmental Planning Policy (SEPP) that substantially governs the carrying out of the project.

The Department has considered the proposal against the relevant provisions of SEPPs 33, 44 and 55 and is satisfied that none of these SEPPs substantially govern the carrying out of this project (see Appendix C).

2.6 Statement of Compliance

Under section 75I of the EP&A Act, the Director-General's report is required to include a statement relating to compliance with the environmental assessment requirements established for the project's EA. The Department is satisfied that the environmental assessment requirements have been complied with.

3 ISSUES RAISED IN SUBMISSIONS

During the exhibition period, the Department received 28 submissions on the project – six from public authorities and 22 from organisations and individuals (21 objected or raised concerns about the proposal).

A copy of the submissions is in Appendix E and Gunlake's response is in Appendix D.

3.1 Public Authorities

The key issues raised by public authorities are summarised below.

Department of Primary Industries (DPI) requested that the approval require the operator to provide annual production data to the Department, implement the proposed erosion and sediment control measures to safeguard the aquatic environment and water quality of Chapmans Creek, Joarimin Creek and downstream to the Wollondilly River, and develop a weed management strategy for the property.

Department of Environment and Climate Change (DECC) identified a number of shortcomings in the ecological assessment of the proposal, in particular, adequacy of the survey information on native vegetation and hollow bearing trees, impacts on micro bats, speckled warbler and white box yellow box woodland vegetation, and an adequate offset strategy. The DECC believes the Aboriginal cultural heritage assessment was inadequate as the EA did not consider sites in the area that were listed on the Aboriginal Heritage Information Management System and recent archaeological surveys undertaken in the area, and the results of consultation with the Aboriginal community. The DECC recommended draft conditions to deal with the management of Aboriginal heritage, air quality, soil and water and noise.

Department of Water and Energy (DWE) requested that the groundwater monitoring plan nominate trigger levels to protect groundwater dependent ecosystems (GDEs) and monitoring protocols for GDEs and that a copy of the plan be provided to DWE for endorsement. Additional modelling of groundwater would be required if quarry inflow exceeds predicted levels. The DWE advised a water licence would be required to be obtained for the interception of groundwater, and requested that the designs for the creek crossings be submitted to the DWE for endorsement.

The Roads and Traffic Authority (RTA) requested consideration be given to the impact of the closure of the median strip at the Red Hills Road and Hume Highway intersection and did not support trucks undertaking right turn movements from the Hume Highway to Portland Avenue and requested that this alternative transport route be removed. The RTA recommended conditions for the upgrade of

the Red Hills Road and Hume Highway intersection and advised an approval would be required to be obtained from the RTA for the proposed works.

The Sydney Catchment Authority (SCA) considered a number of matters in the Water Cycle Management Plan required further information to ensure the development achieved a neutral or beneficial effect on water quality. The SCA requested involvement in the preparation of the surface water quality monitoring program, recommended the extension of the current monitoring program to monitor additional water quality indicators and performance criteria for water quality monitoring. The SCA also recommended the relocation of the proposed effluent management area and additional fencing to protect the riparian area of watercourses.

Goulburn Mulwaree Council (Council) did not object to the proposal, subject to a maximum of 25 truck movements per day during Stage 1, and maximum of 25 truck movements using the Brayton Road route and 75 trucks using the Red Hills Road route, during Stage 2. Council also requested conditions to cover the construction of Red Hills Road extension as a public road prior to Stage 2 operation, upgrade and repair of roads, complaints protocols, community consultative committee and maintenance of buffer areas for the life of the proposal

3.2 Organisations and Individuals

The key issues raised by organisations and individuals are summarised below.

Eastern Australian Pipeline Pty Limited did not object to the proposal and noted the natural gas and ethane pipelines were located 1.2 km from the quarry site and did not expect the pipelines to be affected by the quarry proposal.

Cemex Australia Pty Limited believed the EA failed to address the potential cumulative impacts of the proposal with the Johnniefelds quarry and Lynwood quarry in relation to traffic and transport, and traffic noise. Cemex noted that the traffic study did not examine worst case traffic volumes on the transport route, performance of intersections, environmental capacity of roads and traffic generated by the Lynwood quarry.

Red Hills Road Residence Committee objected to the proposed bypass road and stated that it would increase traffic movements on Red Hills Road north of the bypass road and increase noise and dust and reduce road safety for residents. The bypass road would provide an alternative route for heavy vehicles to avoid the RTA's checking station on the Hume Highway. Quarry trucks should gain access to the Hume Highway through the Lynwood quarry.

19 submissions objecting to the proposal were received from individuals, primarily from landowners near the quarry site or the bypass road route. The issues raised by these submissions are:

- traffic – increase in trucks, condition of the roads, road safety and night time truck movements;
- noise – truck noise and noise from blasting/processing and truck movements on the quarry site;
- dust – increase in dust levels and potential human health impacts;
- water – impacts on groundwater and watercourses;
- flora and fauna;
- need for the proposal - 3 other quarries in Marulan, 2 of which will use rail transport; and
- land values

4 ASSESSMENT

4.1 Traffic and Transport

Issue
The proposal has the potential to increase traffic levels and affect traffic safety on local roads around Marulan.

Consideration
The proposal involves the transportation of quarry products in 2 stages:
- Stage 1 with an average of 25 truck movements per day (and peak of 38 movements) through the town of Marulan for 3-5 years following the commencement of quarrying; and
- Stage 2 (once truck movements through Marulan exceed an average of 25 per day) with 100 truck movements per day for the remainder of the quarry life of 25-27 years.

Stage 1 Product Transportation
The proposed transport route during Stage 1 would be along Brayton Road to Marulan, with north and south bound trucks using the interchange to access the Hume Highway. Trucks returning from the north would offload at the interchange and return to the quarry via Brayton Road. Returning trucks from the south would offload at Portland Road and travel along George Street through Marulan town centre to Brayton Road. The Stage 1 transport route is illustrated in Figure 4 on the following page.

Gunlake has undertaken a traffic assessment of the Stage 1 traffic volumes and transport route. The assessment considered the condition of the roads along the proposed transport route, existing traffic flows and the performance of intersections. The traffic assessment concluded:
- the width of Brayton Road between the quarry access road and the entrance to Johnniefelds quarry was substandard (5.6-5.7 metres wide) and did not comply with the RTA's *Road Design Guide* for a road with flows of 500 vehicles per day;
- Brayton Road between Johnniefelds Quarry and Stoney Creek Road (rural section), and between Stoney Creek Road and George Street (urban section) has a sealed carriageway generally over 7 metres wide;
- the transport route has capacity to accommodate an increase in total vehicle numbers and peak hour flows; and
- the proposed average 25 truck movements per day (peak of 38) and average 1-2 movements per hour would not result in a reduction in the capacity and performance of existing roads and intersections.

To improve the substandard section of Brayton Road, between the quarry access road and Johnniefelds quarry, Gunlake proposes to upgrade the road to provide a 7 metre wide sealed carriageway. The upgraded section of Brayton Road would comply with Council's draft Development Control Plan (DCP) - Provisions for Heavy Vehicle Generating Development, which specifies a minimum sealed carriageway width of 7 metres in rural areas. This would mean the full length of the transport route between the quarry site and the Hume Highway at Marulan would have a minimum 7 metre wide sealed carriageway.

The proposed haulage hours are 24-hours per day between 2am Monday and 6pm Saturday. The distribution of truck movements is expected to be 80% to the north and 20% to the south. Gunlake estimate there would be a maximum of 3 trucks returning from the south per day along George Street through the Marulan town centre.

The majority of the submissions objected to or raised concerns about 24-hour truck movements and an increase in trucks using Brayton Road. To address the concerns about 24-hour truck movements, Gunlake has amended the project to restrict truck movements In Stage 1 to summer daylight hours only (6.00am to 7.00pm Monday to Friday and 7.00am to 1.00pm on Saturdays). There would be no truck movements on Sundays and public holidays. This would bring the Gunlake haulage hours in line with those of the Johnniefelds quarry. The traffic assessment concluded the Stage 1 traffic movements would have no significant impact on traffic flows and the performance of intersections along the transport route. Furthermore, Gunlake would upgrade the Brayton Road between the quarry access road and Johnniefelds quarry, which would improve road safety on this section of the road.

Figure 4 – Proposed Stage 1 Transport Route

The reduction in the haulage hours would increase hourly traffic flows from 1 to 2 movements per hour (average daily movements) or 2 to 3 movements per hour under peak truck movements. There would be no change to the number of truck movements through the Marulan town centre. The Department does not consider the change in the haulage hours, from 24-hour to daylight hours only would have a significant impact on traffic flows, given the existing low traffic flows and capacity of the transport route. Furthermore, the impact on traffic from peak movements would increase the hourly traffic movements by one movement per hour (from 2 to 3 per hour), which is within the capacity of the road network.

Council recommended a maximum of 25 truck movements per day along Brayton Road during Stage 1. Gunlake has proposed an average of 25 truck movements per day (over a month) during daylight hours, with a peak no greater than 50% of the average (or 38 movements per day). The Department does not believe it is necessary to restrict the number of truck movenments to a maximum of 25 per day, given the traffic assessment concluded the Stage 1 truck movements had minimal impacts on traffic flows and performance of the roads and was within the capacity of the existing road network.

Stage 2 Transportation

Gunlake would implement further road improvement works once truck movements exceeded an average of 25 movements per day. Truck movements during Stage 2 of the development would increase to a maximum of 100 per day and operate on a 24-hour basis from 2.00am Monday to 6.00pm Saturday. Based on a northern and southern distribution split, approximately 75 traffic movements would use a new road connecting Brayton Road and Red Hills Road and 25 traffic movements would continue to use Brayton Road to Marulan (the proposed transport route is illustrated in Figure 5). Gunlake expects Stage 2 transportation would start within 3-5 years of the quarry commencing operations. At peak production employees would generate up to 40 light vehicle movements day and service/deliveries would generate several heavy vehicle movements per day.

Figure 5 – Proposed Stage 2 Transport Route

Gunlake would construct a new road between Brayton Road and Red Hills Road to bypass Marulan for trucks with a northern destination. Trucks returning from the north and the south would use the new bypass road. The only truck movements using Brayton Road to Marulan would be those with a southern destination, and they would be restricted to outbound movements only. The bypass road and associated road and intersection works would be completed prior to Stage 2 truck movements commencing. The road works involve:

- construction of a new road on Gunlake land and a Crown road reserve between Brayton Road and Red Hills Road, to a sealed width of 7 metres;
- upgrading Red Hills Road between the bypass road and Hume Highway to provide a 7 metre wide sealed carriageway;

- construction of a roundabout at the intersection of Brayton Road and George Street; and
- upgrading the intersection of Red Hills Road and the Hume Highway and closure of the Hume Highway median crossing.

The EA has assessed the impact of 100 truck movements on Brayton Road between the quarry access road and the intersection of Brayton Road and the bypass road and the performance of intersections along the transport route. Stage 2 traffic movements would increase hourly truck movements by 2 truck movements in each direction or 3 truck movements in each direction during the peak hour. The traffic assessment considered the increase in truck movements was insignificant in terms of the capacity of the roads and intersections.

The proposed roundabout at the intersection of Brayton Road, George Street and the Hume Highway underpass would enable trucks returning from the north to offload at Marulan and undertake a u-turn movement at the roundabout to return north and offload at the Red Hills Road intersection. Up to 40 truck movements per day (or 2 trucks/hour) would use the proposed roundabout. The traffic assessment concluded that u-turn movements by heavy vehicles could be undertaken safely and would be within the capacity of the Brayton Road and George Street intersection.

Trucks with a southern destination would continue to use Brayton Road to Marulan at an average of 25 movements per day for the life of the quarry, but only between the hours of 6.00am to 7.00pm Monday to Saturday. Trucks returning from the south would offload at Red Hills Road, removing up to 25 truck movements per day (2 movements per hour) from travelling along George Street through the town centre.

The majority of submissions objected to the increase in truck traffic along Brayton Road. The traffic assessment concluded the proposal would have minimal impact on traffic flows and the performance of intersections along the transport route. The construction of a road to bypass Marulan would remove all northbound trucks and returning trucks from the residential section of Brayton Road.

Several submissions, including the Red Hills Road Residence Committee to Review Proposed Transport Arrangements for the Gunlake Quarry at Marulan, raised concerns about the impact of additional trucks using Red Hills Road to avoid the RTA checking station at Marulan. Red Hills Road is a lightly trafficked rural road which intersects with the Hume Highway at its southern end near Marulan and its northern end via Wollumbi Road. Red Hills Road at its southern end has a traffic volume of about 65 vehicles per day (2-way) and an average of 6 vehicles per hour during the peak hour. Quarry trucks would use Red Hills Road between the bypass road and the Hume Highway. No quarry traffic would use Red Hills Road north of this section, nor the Wollumbi Road intersection. The bypass road could provide an alternative route for trucks wishing to avoid the RTA checking station at Marulan, however, the alternative would be a convoluted route along narrow rural roads. Furthermore, sanctions exist for trucks purposely avoiding RTA checking stations.

One submission was concerned the proposal would result in the closure of the Hume Highway's Wollumbi Road median crossing. The proposed closure is at the southern end of Red Hills Road and the median crossing at Wollumbi Road (Red Hills Road north) is not affected by the project. The closure of the Red Hills Road median crossing is required by the RTA for safety reasons. Approximately 35 vehicles would be affected by the closure of the median crossing, those vehicles making a right turn movements into or out of Red Hills Road. Gunlake states that the closure would result in a minor inconvenience for residents as vehicles which turn right from the Hume Highway into Red Hills Road would need to offload at Marulan and return to Red Hills Road via the bypass road. Vehicles which turn right onto the highway from Red Hills Road would need to travel to Marulan via the bypass road. The traffic assessment concluded the closure of the median crossing is justified on road safety grounds and an alternative route would be provided for vehicles which currently make those movements.

Several submissions suggested Gunlake should develop a common product transport and/or access route with the proposed Lynwood quarry. Gunlake is of the view this is not a viable option as Gunlake does not adjoin the Lynwood property and the proposed access road linking Lynwood quarry to the Hume Highway is a private haul road. A quarry haul road between the Gunlake quarry and Lynwood quarry would need to traverse a private property and would be located close to the extraction area on the Lynwood quarry site. An alternative access to the Lynwood quarry could be obtained via Stoney Creek Road. However, this would mean that truck movements would impact on more residents than the bypass road proposal, as as there are more dwellings on Maclura Drive and Stoney Creek Road

than on the bypass road which is in a rural area. The consent for the Lynwood quarry permitted the use of Stoney Creek Road for construction traffic during the construction of the Main Southern Railway Line overpass. However, this was only a temporary measure, as once the railway overpass was completed, construction traffic would access the Lynwood quarry site via Portland Avenue. The Department agrees that a quarry haul road between the 2 quarries is not a viable option and the use of Stoney Creek Road would increase the number of residences affected by truck movements.

Cemex was concerned that the traffic assessment did not consider the cululative impact of traffic generated by Johnniefelds quarry and no assessment of intersection performance was made. Gunlake states that the project would increase the number of heavy vehicle movements on the transport route (quantity and proportion of all traffic) however, the total number of vehicles are low and within the capacity of the road network and with no detrimental impact on overall and peak flows or the performance of intersections. The existing high proportion of heavy vehicles (27% on the rural section and 11% on the urban section of Brayton Road) would include trucks generated by Johnniefelds quarry. The EA concluded the project would have minimal impact on traffic flows. Furthermore, Gunlake would upgrade roads to comply with Council's draft DCP Provisions for Heavy Vehicle Generating Development. The design guide recommends for rural roads a total road formation of 8 metres, of which 7 metres is sealed (3.0 metre lane and 0.5 metre sealed shoulder).

Council recommended a maximum of 25 truck movements per day through Marulan, a maximum of 75 truck movements per day using Red Hills Road and construction of the Red Hills Road haulage route as a public road prior to the commencement of Stage 2 operations. Gunlake has agreed to the construction and dedication of the bypass road to Council prior to Stage 2 operations commencing, but requests deletion of the restriction on maximum numbers for Brayton Road and Red Hills Road and replacement with average and approximately, respectively. The traffic assessment has concluded the addition of 100 truck movements on the proposed transport route would have minimal impact on traffic flows and intersection performances. Furthermore, Gunlake would upgrade roads to Council's design standards for roads which had a sealed carriageway of less than 7 metres.

In its submission the RTA has raised no objection to the proposal subject to conditions relating to intersection design, safety, construction and operation.

Conclusion

The Department is satisfied with the traffic assessment and the proposed staging of product transportation. The Council recommended a limit on the number of truck movements, a maximum of 25 per day during Stage 1 and 75 per day on the bypass road and 25 per day through Marulan during Stage 2. Gunlake's proposal seeks an average of 25 per day averaged over a month with a peak of 38 movements during Stage 1 and 100 movements per day during Stage 2, which includes an 25 movements per day through Marulan for the life of the quarry. Gunlake has amended the proposal to reduce the hours of transportation during Stage 1, from 24 hours per day to daylight hours only during Monday to Friday and Saturday mornings. During Stage 2 transportation, trucking hours would increase to 24 hours per day (Monday to Saturday) along the bypass road, but movements through Marulan would be restricted to the daytime period (Mionday to Saturday). There would be no truck movements on Sundays and public holidays. Conditions have been incorporated to reflect the changed transportation hours, proposed road upgrade works and RTA requirements.

4.2 Noise and Blasting

The EA examined the existing acoustic environment and the potential for noise emissions (during construction and operation) and the effects of blasting on the closest residences. There are five residences (4 existing and 1 potential) within a distance of approximately 1 km of the quarry processing area (see Figure 6). The EA also assessed transport noise impacts on Brayton Road, George Street, bypass road and Red Hills Road.

Construction Noise Assessment

Construction noise would occur during erection of the processing plant and construction of a 15 metre high earth bund along the north-eastern boundary. The noise assessment concluded the proposed construction activities would comply with the construction noise goals (44-46 dB(A)) for a 4 to 26 week construction period at all residential receivers.

The DECC noted that noise impacts from the construction of the proposed bypass road was not assessed. Gunlake states that an assessment of noise generated by the construction of the bypass

road was not required due to the distances between the proposed road and existing residences. Two residences are located near the bypass road, one approximately 230 metres to the east of the intersection of the bypass road and Brayton Road and the other approximately 500 metres to the north of the bypass road.

The Department is satisfied with the construction noise assessment of the quarry site, however, the assessment of noise from the construction of the bypass road is not adequate. Consequently the Department believes that Gunlake should be required to undertake an assessment of construction noise impacts at these two residences to determine the relevant noise goals for the construction of the bypass road, prior to road construction commencing.

Operational Noise Assessment

Background noise levels were modelled based on attended and unattended noise monitoring at 4 existing residences near the quarry site.

The calculated daytime rating background noise level ($LA_{eq\ (15\ minutes)}$) ranged from 30 to 36 dB(A) for the daytime period, 31 to 35 dB(A) for the evening and 30 to 32 dB(A) for the nighttime period at the four residences. These figures were used to assess intrusive noise goals for the residences in accordance with DECC's Industrial Noise Policy (INP), which ranged from 35 to 41 dB(A), 36 to 40 and 35 to 37, respectively for the day, evening and nighttime periods.

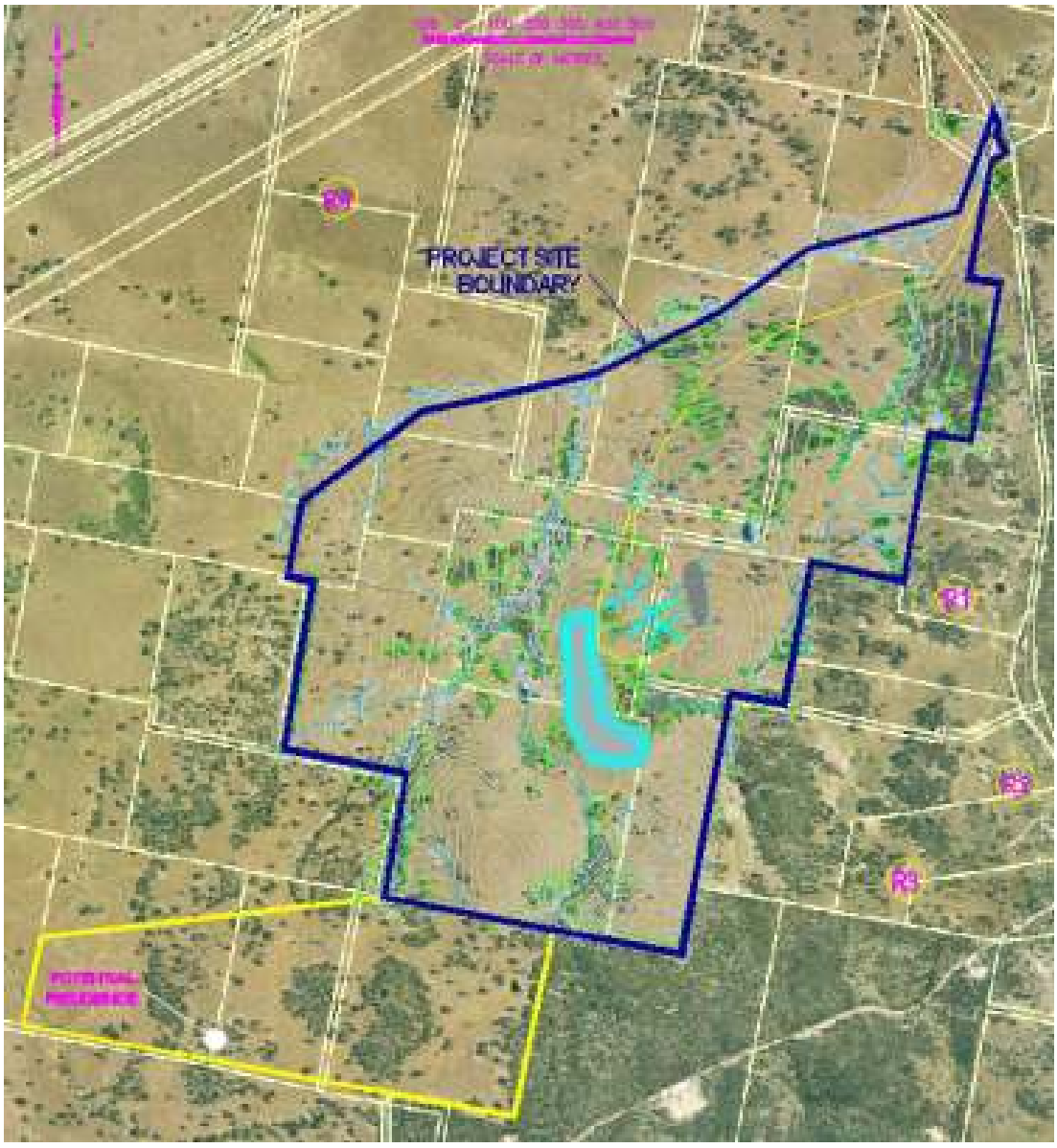

Figure 6 – Location of Nearest Residences

Gunlake developed a noise model to simulate the significant noise sources within the quarry site. The model also considered meteorological effects, surrounding terrain and distance from source to receiver. Sound pressure measurements of quarry equipment were based on noise levels obtained from the noise consultants reference levels. Two operational scenarios were modelled, one based on Year 1 operation and one based on Year 10+ operation.

The noise assessment predicts that the operation of the quarry under both scenarios would comply with the relevant day, evening and nighttime period noise goals at all neighbouring residences under calm and adverse wind conditions, and temperature inversion conditions for the nighttime period. These predictions did not include blasthole drilling. Blasthole drilling would occur on average 1 day per week and only during the daytime period. Gunlake modelled the impact of noise from blasthole drilling at the residences, which predicted noise levels would increase by 0 dB(A) to 2 dB(A) under the Year 1 scenario, but there was no noise increase during the Year 10 scenario. The EA concluded that noise from blasthole drilling during Year 10+ operations would be shielded by the quarry pit, therefore there would be no corresponding noise level increase at the nearby residences.

The cumulative impact of the proposal with existing and proposed noise sources (Johnniefelds quarry and Lynwood quarry, respectively) has been assessed in terms of compliance with the amenity noise criteria (50 dB(A). The noise assessment predicted the cumulative noise impacts at the two closest residence to these 2 quarries would be lower than the amenity noise criteria, of the order of 15 dB(A) and 23 dB(A), respectively for receivers R1 and R5 (the potential residence in Figure 6).

Ten submissions were concerned the project would result in unacceptable noise levels and that cumulative noise impacts had not been addressed. Gunlake states a noise assessment of the proposal (and its cumulative impacts) has predicted the proposal would comply with the Project Specific Noise Levels (PSNLs) determined under the INP. Gunlake has also committed to implement noise control measures and undertake monitoring of the noise levels.

Four submissions stated that the Land and Environment Court's decision in 1995 to dismiss an appeal from Maywood Sands on Council's refusal of a sand and gravel extraction proposal, on noise and dust impacts, set a precedent for the refusal of the Gunlake proposal. The Maywood Sands proposal was located on the adjoining property to the south and was refused on the grounds that the noise impacts had not been addressed due to the absence of a comprehensive acoustical assessment of the proposal. Gunlake states that the noise impact of the Gunlake quarry project has been fully addressed by the EA.

The DECC raised concern that the noise generated by the jaw crusher may be underestimated and that the noise assessment has not considered site activities that could result in sleep disturbance. The DECC also recommended noise limits for the residential receivers, based on noise levels predicted by the noise modelling, rather than the PSNL.

Gunlake states the sound power level of the jaw crusher (94 dB(A)) was based on the measurement of an operating jaw crusher at the Mount Boppy Mine. Furthermore, if the noise level of the jaw crusher was increased by 15 dB(A) the overall noise level at the nearest residence (R1) would result in a minor increase in noise levels, from 37.9 dB(A) to 38.7 dB(A). Gunlake believes the jaw crusher is not a significant determinant of noise at the residence and should not be identified in isolation for independent verification. The only activities that would be carried out during the evening and nighttime periods would be truck loading and dispatch and this would only occur when Stage 2 product transportation starts (expected to be 3-5 years after operations commence). Gunlake has assessed the potential for sleep disturbance at the nearest residence (R1) and noted the worst case predicted noise level from evening/nighttime truck loading and product transportation is 35 dB(A), which is well below the sleep disturbance criteria of 46 dB(A). In addition, Gunlake would implement a number of activities to reduce noise levels, such as the use of aluminium truck bodies with low sides to minimise the drop height and impact noise, and educate and train equipment operators to minimise noise impacts. The processing/dispatch area is also shielded from residences to the east by the overburden emplacement bund.

The Department is satisfied that the limits recommended by DECC are appropriate for the proposal. A condition has been included to require Gunlake to prepare a Noise Monitoring Program to assess compliance with the noise criteria and validate noise modelling predictions. The program would also detail specific actions for responding to exceedances of criteria and complaints should they occur.

Road Noise Assessment

The DECC publication *Environmental Criteria for Road Traffic Noise* (ECRTN) provides standards for road traffic noise associated with the proposed quarry. The relevant ECRTN criteria for the assessment of road traffic noise is $L_{Aeq(1\ hour)}$ 60 dB(A) for 7:00 am to 10:00 pm (daytime) and 55 dB(A) for 10:00 pm to 7:00 am (nighttime) for a collector road, and 55 dB(A) and 50 dB(A), respectively for a local road. The ECRTN guideline states that where the criteria are already exceeded, the traffic arising from the proposal should not lead to an increase in existing noise levels of more than 2 dB(A). Accordingly, Brayton Road, George Street and Brayton Road/George Street Interchange underpass were assessed as a collector road and Red Hills Road as a local road.

The EA assessed noise impacts from quarry traffic on the basis of the US Environment Protection Agency's method for the prediction of road traffic noise. The model takes into account the L_{amax} vehicle noise, receiver offset distances, pass by duration, vehicle speed, ground absorption, hourly vehicle movements, receiver height, truck exhaust height and location of intervening barriers.

The EA assessed the impact of traffic noise levels at the closest residences to the proposed transport route - Brayton Road (rural and urban sections), Red Hills Road and Brayton Road and George Street intersection, under a number of traffic scenarios. These scenarios represented increases in truck movements of 1, 2, 4 and 8 per hour respectively, during the day and nighttime periods and under maximum hourly (peak flow), minimum hourly (low flow) and 7 day average maximum hourly of existing traffic flows.

The assessment predicted that traffic movements under these scenarios in the rural section of Brayton Road (between the quarry site and Stoney Creek Road) would comply with the ECRTN's criteria of 60 dB(A) and 55 dB(A) for day and night periods, respectively. For example one truck movement per hour generated by the Gunlake quarry would result in a noise level of 52.6 dB(A), increasing to 53.5 dB(A) for 8 truck movements per hour under maximum (peak) traffic flows or 42.8 dB(A) and 47.6 dB(A) respectively under minimum (light) traffic flows during the day (see Table 2. The resulting noise level is below that of the ECRTN's 60 dB(A) for a collector road. The traffic assessment also predicted the number of additional truck movements that would be possible to comply with the ECRTN's criteria, in this case 170 additional truck movements under maximum traffic flows during the day (and 55 during the nighttime) would comply with the criteria. The assessment predicted the addition of 3 movements per hour is consistent with the ECRTN and would result in a minor increase in noise levels at all residences on the rural section of Brayton Road.

The rural section of Brayton Road would be used by all truck movements under Stage 1 (average 25 movements per day and 38 peak) and Stage 2 (100 movements per day) product transportation. Gunlake has amended the proposal to remove nighttime truck movements during Stage 1, therefore nighttime truck movements would not commence until Stage 2 product transportation.

	Maximum Hourly Existing Plus Quarry				**Minimum Hourly Existing Plus Quarry**				**7 Day Average Maximum Hourly Existing Plus Quarry**			
Number of Hourly Quarry Truck Movements	1	2	4	8	1	2	4	8	1	2	4	8
Day (7.00am-10.00pm)	52.6	52.8	53.0	53.5	42.8	43.9	45.5	47.6	50.9	51.1	51.4	52.1
Maximum Allowable Truck Movements	170				176				175			
Night (10.00pm to 7.00am)	49.6	49.9	50.3	51.1	42.5	43.7	45.4	47.5	47.6	48.0	48.7	49.9
Maximum Allowable Truck Movements	55				55				52			

Table 2 – Predicted Future $LA_{eq\ (1\ hour)}$ Traffic Noise Levels – Brayton Road (Rural Section)

On the urban section of Brayton Road (Between Stoney Creek Road and George Street) the existing noise levels under maximum traffic flows exceed the 60 db(A) criteria. Under the ECRTN, where existing noise levels exceed the criteria, then the proposal may not increase noise levels by more than 2 dB(A). The traffic assessment predicted that truck movements could increase by 18 and 14 per hour during the day and nighttime periods respectively, under maximum traffic flows, and comply with the ECRTN requirement that noise levels do not increase by more than 2 dB(A). The assessment

predicted the addition of 3 movements per hour from Stage 1 and Stage 2 truck movements would result in a minor increase in noise levels (ranging from 56.6 to 57.2 and 62.3 to 62.9 dB(A). During Stage 2 product transportation, only outbound trucks to southern markets would use Brayton Road to Marulan (25 movements per day). There would be no truck movements during the nighttime period on the urban section of Brayton Road.

The traffic noise assessment noted that existing noise levels on George Street are above the 60 dB(A) criteria and based on the peak hour traffic flow, the maximum allowable hourly quarry traffic to comply with an increase in noise levels of no more than 2 dB(A), would be 6 truck movements per hour. Gunlake proposes no more than 3 truck movements would use George Street per day, and this would only occur in Stage 1. During Stage 2 no trucks would use George Street.

Red Hills Road and the bypass road are the principal transport route for deliveries to the north and all returning trucks from the north and south in Stage 2 and would be used 24 hours per day. The traffic assessment predicted the allowable number of truck movements to comply with the 60 dB(A) and 55 dB(A) criteria for day and nighttime periods are 2000 trucks and 650 trucks per hour respectively. Only one residence is located on the quarry access road section of Red Hills Road.

Trucks returning from the north during Stage 2 would undertake a u-turn at a proposed roundabout at the intersection of Brayton Road, George Street and the Interchange underpass. The existing peak hour noise levels from traffic on George Street are higher than the ECRTN criteria at the nearest residence. The traffic assessment predicted the allowable number of truck movements under the peak flow traffic scenario to comply with a 2 dB(A) increase in noise levels would be 6 truck movements per hour. Gunlake prop[oses no more that 3 truck movements per hour, which is within the permissible increase in hourly truck movements to comply with the ECRTN.

Four submissions stated that the Court's refusal of the Maywood Sands proposal in 1995 on noise (including traffic noise) grounds sets a precedent for the refusal of the Gunlake proposal. Gunlake states the Court refused the Maywood sands proposal because the traffic noise impacts had not been adequately addressed. Gunlake states that the traffic noise impact of the project has been fully addressed by the EA, which predicted that traffic noise levels complied with the ECRTN's criteria for collector and local roads during the day and nighttime periods.

Cemex was concerned that the road traffic noise assessment was inadequate. Gunlake states that an assessment of the likely impact of the quarry project was undertaken, which predicted the worst case quarry traffic noise levels from 100 movements per day and a maximum of 3 truck movements per hour, would comply with the ECRTN's day and nighttime criteria for all residences along the proposed transport route.

The DECC raised concern that the traffic noise assessment may have underestimated the noise impacts of nighttime traffic movements. Gunlake states that the traffic noise assessment estimated the maximum number of allowable traffic movements to comply with the ECRTN criteria (either the 60 dB(A) and 55 dB(A), or no more than 2 dB(A) increase) and demonstrated that the proposed traffic levels resulting from the project are below the maximum allowable vehicle movements under the ECRTN. The project has been amended to remove nighttime traffic movements through the urban section of Brayton Road in Stage 1. During Stage 2, all nighttime traffic would use Red Hills Road, bypass road and rural section of Brayton Road. Noise levels generated by trucks undertaking a u-turn movement at the proposed roundabout would comply with the ECRTN. There would be no nighttime truck movements on the urban section of Brayton Road.

The Department considers that road noise has been satisfactorily addressed by Gunlake and that the proposed bypass of Marulan during Stage 2 would reduce transportation noise impacts on Marulan residents.

Blasting

The criteria adopted for blasting impact at dwellings for blasts undertaken within the proposed hours of blasting at the quarry are as follows:

- Overpressure goal 115 dB (linear peak) measured at 3 metres from any dwelling, may be exceeded up to 5% of the total number of blasts over a period of 12 months, but should not exceed 120 dBL (linear peak) at any time;
- Vibration goal 5 mm/s peak particle velocity.

Based on a maximum instantaneous charge (MIC) of 49 kg, it is predicted the vibration criterion of 5 mm/ would be met for all blasts at approximately 500 metres from the blast site. The nearest residence, R1, is some 1170 metres to the east, well outside this perimeter.

Again based on an MIC of 49 kg, the overpressure criterion of 115 dBL is predicted to be met for all blasts at a distance of 700 metres from the blast site. The EA states that the predicted levels of peak airblast comply with the overpressure criterion of 115 dBL at all residences. Gunlake would monitor all blasts at the closest/most potentially affected residence to establish compliance with the blasting criteria.
The DECC has recommended comprehensive management and monitoring of blasts which have been incorporated in conditions.

The Department is satisfied that with the implementation of proposed mitigating measures, monitoring as required in the conditions and appropriate response procedures, noise and blasting impacts from the quarry would be acceptable. However, the EA has not considered the potential cumulative impacts with blasting at the nearby Johnniefelds quarry and proposed Lynwood quarry. Accordingly, the Department believes that Gunlake should:

- co-ordinate its blasting program with that of Johnniefelds quarry and Lynwood quarry to ensure they do not blast on the same day; and
- develop a joint notification process with Cemex's quarries to alert residents at least 24 hours before any blast.

4.3 Air Quality

Gunlake has undertaken an air quality assessment of the project and a cumulative impact assessment of the nearby Johnniefelds quarry and proposed Lynwood quarry.

The assessment identified the potential dust generating activities, which includes the stripping, haulage and unloading of overburden; drilling and blasting; internal haulage, dumping, crushing and screening; and truck loading. The generation of dust by wind erosion of exposed surfaces and stockpiles was also considered.

The air quality modelling indicates that worst case dust emissions generated by the project would comply with the DECC criteria for dust deposition, total suspended particulates (TSP), and particulate matter (PM_{10}) for 24-hour average and annual average, at the nearest residences in the vicinity of the site.

A cumulative impact assessment was undertaken of the Johnniefelds quarry and Lynwood quarry, which are located about 2 km to the east and south, respectively. The assessment predicted a dust deposition level of 4.62 g/m^2/month from the operation of 3 quarries, which is a minor exceedance of the air quality goal of 4 g/m^2/month. The maximum predicted incremental increase from the project is 1.5 g/m^2/month, which satisfied the maximum incremental increases goal of 2 g/m^2/month. Cumulative PM_{10} and TSP levels were predicted to be below the air quality goals of 50 and 30 $\mu g/m^2$/month for the former and 90 $\mu g/m^2$/month for the latter.

The EA assessed the impact of dust on vegetation and livestock and concluded the project is unlikely to result in any significant impacts.

Gunlake would implement a number of operational dust control measures to reduce dust emissions, such as water sprays at the discharge points at the primary crusher and processing plant, erecting a wind break along the western edge of the processing area to control wind erosion from the product stockpiles, and use of a water truck on unsealed internal haul roads. The quarry haul road would be sealed and dust monitoring would be undertaken to confirm compliance with the dust criteria at the nearest residences.

Ten submissions raised concerns that the project would result in unacceptable dust impacts. Gunlake has undertaken an air quality assessment which predicted the project would comply with the DECC's air quality goals. Furthermore, Gunlake would implement dust control measures and undertake dust monitoring to determine compliance with the dust goals.

The DECC and the Department are satisfied with the air quality assessment and that the project would comply with DECC's air quality criteria at nearby residences. However, the Department has

recommended a range of conditions that would require Gunlake to minimise and manage its dust impacts and to prepare and implement an air quality monitoring program for the project.

4.4 Groundwater and Surface Water

The EA assessed the impact of the project on surface water and groundwater resources. The site is located adjacent to Chapmans Creek which flows into Joarimin Creek. Joarimin Creek flows into the Wollondilly River, which forms part of Sydney's drinking water catchment.

Surface Water
The topography of the quarry site is undulating with two main drainage lines in the main quarry area, separated by the ridge that would become the quarry area. Both flow in a southwest to northeast direction into Chapmans Creek which is located on the northern boundary of the site. Chapmans Creek is an ephemeral watercourse and typically consists of a series of ponds. A number of springs are located within 1.4 km of the quarry. The bypass road crosses two watercourses, one a small depression/drainage line, but the other is Joarimin Creek, a 4th order stream, which joins Chapmans Creek and eventually flows into the Wollondilly River. Potential impacts of the proposal on surface water include the effects of retaining runoff from the site and the risk to Sydney's drinking water catchment should sediment laden water escape into the watercourses.

The EA includes a concept erosion and sediment control plan that indicates the general location of surface water collection drains and 6 sediment basins, 5 of which are intended to also serve as storage dams, holding water for use in processing and for pasture irrigation. One basin (WQCP-6) would hold water captured in the quarry pit. Gunlake proposes to implement standard erosion and sediment control measures for the construction of the bypass road. However a specific soil and water management plan would be prepared for the Joarimin Creek crossing.

Water would be required for dust suppression at the crushing plant/stockpiles and unsealed heavy haul roads and hardstand areas. Gunlake expects the amount of stormwater that would be collected from the impervious surfaces on the site would be greater than the combined demand for water from the crushing plant and dust suppression. The extra water is proposed to be irrigated on pasture on the site. Approximately 10 hectares of land would be set aside for pasture irrigation. The total water demand of the project is expected to be 71.8 ML per year (see Table 3). The water would be drawn from WQCP-1.

Water Consumption	**Volume (ML/year)**
Crushing plant	1.6
Dust suppression	13
Rainfall deficit (evaporation)	7.2
Pasture irrigation	50
Total Water Demand	71.8

Table 3 – Water Balance

To minimise the impacts of the project on water quality, Gunlake would implement a soil and water management plan, develop a program for the maintenance of the water control measures and undertake water quality monitoring. Gunlake would also rehabilitate the riparian zone of a tributary of Chapmans Creek to the west of the main quarry area. Approximately 1500 metres of the creek would be rehabilitated with riparian vegetation and fenced off to prevent livestock access.

The SCA considered the project would have a neutral or beneficial effect on water quality in the drinking water catchment provided that Gunlake implemented a water quality monitoring program and developed a protocol to investigate exceedances of the water quality criteria. SCA also requested Gunlake to provide fencing along creek lines, implement a weed control program and relocate the effluent management area. Gunlake accepts the SCA's comments except for the requirement to monitor the water quality of Joarimin Creek and place a public positive covenant under the *Conveyancing Act 1919* for the fencing of the riparian areas. Gunlake would provide the additional fencing requested by SCA, but believes that a covenant to provide compliance is unnecessary as the project approval is more appropriate for compliance matters.

DWE advised the proposed water quality control ponds and sediment basins are exempt from Harvestable Rights and would not require a licence under the *Water Management Act 2000* provided

they capture runoff from disturbed areas and are for environmental management purposes. DWE also requested that Gunlake design the crossings of Chapmans Creek and Joarimin Creek in accordance with Government guidelines. Gunlake would submit the designs to DWE prior to construction.

DECC recommended the WQCP be redesigned to capture and settle rainfall from a 95th percentile storm event as the site is located within Sydney's drinking water catchment. DPI raised no objections to the proposed soil and water management measures.

The Department is satisfied with the surface water quality assessment and that the proposed soil and water management measures would protect downstream environments from sediment laden runoff if properly designed and managed. However, the Department has recommended a range of conditions that would require Gunlake to implement a water management plan that provides design and management details for stormwater and operational water, undertake monitoring of water quality and design the WQCP in accordance with the 95th percentile storm event.

Groundwater

The project site contains two aquifers, a hardrock aquifer within the fractured rock underlying the entire site; and a less extensive alluvial aquifer associated with alluvial deposits in the drainage lines of the Chapmans Creek system. The low permeability fractured porphyry rock was found to be a poor groundwater source with expected low inflows.

The groundwater assessment indicated the groundwater level ranges from 6 to 21 metres below ground with a flow direction generally towards the north. The sampled groundwater was moderate to highly saline. The EA expects low groundwater inflow in the first 2 years of operation, of the order of less than 0.02 litres per second or approximately 0.3 ML per year. Groundwater inflow is expected to increase as the quarry deepens and extends to the south. Gunlake expects inflows would increase by Year 20 to 30 between 0.8 to 0.11 litres per second or 2.5 to 3.5 ML per year, consequently the quarry pit would require dewatering from time to time. Any excess water not required for dust suppression and processing would be transferred to out of pit storage in WQCP-6.

The EA has assessed the project against 4 potential groundwater related impacts:

- groundwater dependent ecosystems;
- groundwater users
- cumulative groundwater impacts; and
- generation of acid mine leachate.

The EA identified 9 water features or springs within 1.4 km of the site, the closest about 200 metres west of the quarry (Spring 6). None of these springs support groundwater dependent ecosystems. The assessment considered the project would have minimal impact on Spring 6 as its source of groundwater is up gradient of the quarry. However the gradient of water and direction of flow close to the spring may be influenced by the westerly advance of the quarry. The assessment considered the project would have minimal impact on the other springs given the distance from the proposed quarry pit.

The EA considered that due to the low hydraulic conductivity of the hard rock, the project would not adversely affect the groundwater system in the area. However, the project at Year 30 would alter the hydrogeological conditions in close proximity to the quarry pit. The assessment considered the changes would be peripheral to the void and confined to a zone of 100-200 metres from the quarry.

The closest existing groundwater bore is located 1.5 km from the proposed quarry, with 4 other bores within 5 km of the site. These bores target the hard rock aquifers and were installed for stock watering purposes. The assessment concluded the project would have minimal impact on other groundwater users in the area because of the separation distance between these bores and the site and the low permeability of the hard rock aquifer.

The project is unlikely to have any cumulative impacts on groundwater due to the Johnniefelds quarry and the Lynwood quarry. Groundwater drawdown is not expected to extend beyond a distance of 200 metres from Johnniefelds quarry and 500 metres of Lynwood quarry. Both quarries are located about 1.8 km and 2.9 km respectively, from the Gunlake quarry. The assessment considered the potential for the production of acid leachate is very low as rock quality testing did not record the presence of pyrite or other metal sulphide minerals.

The DECC was concerned that groundwater with high salinity may be used as irrigation water which could impact on the health and growth of vegetation, and high levels of sodium in soil could result in soil sodicity which increases the erodibility of soil, limits water infiltration and reduces hydraulic conductivity. The DECC recommended Gunlake undertake a detailed site assessment of the proposed irrigation areas and monitoring of water quality. The DECC was concerned that one of the irrigation areas was close to native vegetation that was propsoed to be retained as compensatory habitat. As the irrigation water was saline, there was potential that native vegetation in close proximity to the irrigation areas would be adversely affected. Gunlake has agreed to remove irrigation area B within vegetation offset area 1 and investigate a more suitable irrugation area elsewhere on the propoerty. Excess groundwater from the pit would be stored at a dedicated sediment basin (WQCP-6) and if highly saline, would be mixed with less saline water prior to irrigation.

DWE was concerned that groundwater dependent ecosystems may be impacted and emphasised the need for groundwater monitoring to include frequent inspection of the condition of groundwater dependent ecosystems and terrestrial vegetation. DWE also required additional modelling should groundwater inflow into the pit exceed the predicted level of 3.5 ML per year. Gunlake has agreed to DWE's recommendations.

Conclusion

The Department is satisfied that sufficient investigation has been undertaken to predict the likely effects of the quarry on surface and groundwater. However, to give greater assurance that the impacts are as predicted, the Department recommends that Gunlake should:

- prepare a detailed Site Water Balance;
- prepare and implement an Erosion and Sediment Control Plan to minimise impacts on Sydney's drinking water catchment;
- prepare and undertake pasture irrigation, surface and groundwater monitoring; and
- undertake additional groundwater modelling and assessment should inflow to the quarry exceed 3.5 ML per year.

4.5 Flora and Fauna

The quarry site consists of cleared grazing land with scattered trees, currently used for sheep grazing. The ecological report identified 8 vegetation communities on the quarry and bypass road sites. Five were native vegetation communities and three were derived or artificial communities (see Table 4).

Community Number	Vegetaion Community	Location
Community 1	Riparian Floodplain Woodland	Quarry site/Bypass road
Community 2	Woodland/Open Woodland	Quarry site/Bypass road
Community 3	Open Forest/Woodland	Quarry site
Community 4	Woodland	Bypass road
Community 5	Ridgetop Open Forest/Woodland	Bypass road
Community 6	Plantations/Orchards	Bypass road
Community 7	Dams/Fringing Vegetation	Quarry site
Community 8	Open Cleared Grassland/Derived Pasture	Quarry site/Bypass road

Table 4 – Vegetation Communities

The project would remove or impact on approximately 8.8 ha of native vegetation communities and 9 ha of open cleared grassland/derived pasture on the quarry site. The native vegetation communities consist of 1.6 ha of Riparian Floodplain Woodland (Community 1), 6.2 ha of Box-Gum Woodland (Community 2) and 1 ha of Argyle Apple/Stringybark Open Forest Woodland (Community 3). The EA considered that two endangered ecological communities (EEC), White Box Yellow Box Blakely's Red Gum Woodland and Natural Temperate Grassland of the Southern Tablelands of NSW and the ACT had the potential to occur in the area. The ecological report considered the Riparian Floodplain Woodland community could be considered to constitute the EEC Box Gum Woodland that due to the presence of Yellow Box and various characteristic grass and understorey species. Similarly, the presence of Yellow Box, Blakely's Red Gum and various characteristic grass and understorey species in the Box Gum Woodland community could be considered to constitute the EEC Box Gum Woodland. However, the ecological assessment did not consider the grassland on the quarry site (Community 8), which is a mix of native and exotic pasture grasses and scattered shrub, herb and forb species, did not constitute the EEC Natural Temperate Grassland of the Southern Tablelands of NSW and the ACT

community. Consequently the project would involve the clearing of approximately 7.8 ha of EEC vegetation.

Although the Community 1 and Community 2 vegetation was considered to be Box Gum Woodland EEC, the vegetation was a highly modified and disturbed form of the EEC vegetation, having been cleared in the past to create pasture for grazing purposes. The vegetation has been reduced to scattered clumps of trees with a modified grassy ground layer. The open-cleared grassland/derived pasture vegetation (Community 8) consisted of open pasture and is treeless due to past clearing apart from the occasional paddock tree. Although the community contains a mix of native and introduced grass species, a notable species within this community is a noxious grass, Serrated Tussock. The ecological assessment did not consider this highly modified community comprised an EEC.

The proposed bypass road is located on land with native and introduced vegetation. The vegetation communities on the section of the road between Brayton Road and Joarimin Creek consist of Riparian Floodplain Woodland (Community 1), Woodland–White Gum/Argyle Apple (Community 4), and Plantation/Orchard (Community 6) and Open Cleared Grassland/Derived Pasture (Community 8), and on the unformed Crown road between Joarimin Creek and Red Hills Road, Ridgetop Open Forest/Woodland (Community 5), Box-Gum Woodland (Community 2), Plantation/Orchard (Community 6) and Open Cleared Grassland/Derived Pasture (Community 8). The construction of the proposed bypass road would require the clearing of a strip of vegetation approximately 20 metres wide for a distance of about 2.1 km, of which 0.5 km is located in the western part of the road between Joarimin Creek and Brayton Road and 1.6 km in the eastern portion on the unformed Crown road. A total of 4..2 ha of vegetation would be cleared, consisting of 0.5 ha of native vegetation and 3.7 ha of pasture and plantation/orchard vegetation. The majority of the native vegetation community is Woodland-White Gum/Argyle Apple with only a small area of Ridgetop Open Forest/Wood and Riparian Floodplain Woodland affected by the road. The only EEC vegetation is the Box Gum Woodland (being the community 1 and community 2 vegetation).

The EA assessed the impact of upgrading Brayton Road and Red Hills Road (increasing the road width) on the vegetation in the road reserve. Although the vegetation is dominated by native species, the main community were shrubby eucalypt such as Apple Box, Purple Kunzea and Dogwood. There were also remnants of the White Box Yellow Box Blakely's Red Gum Grassy Woodland EEC, in various locations within the road reserve. The assessment concluded the upgrading of the roads would have minimal impact on the Box Gum Woodland EEC vegetation.

The ecological report identified 43 habitat trees on the quarry site, most with small hollows that would be removed. Within the route of the proposed bypass road there were few hollow bearing trees. Gunlake would design the route to minimise the loss of mature trees. Although the project would remove approximately 7.8 ha of vegetation that meets the criteria for the EEC White Box-Yellow Box-Blakely's Red Gum Woodland, Gunlake considers the loss of the EEC vegetation is unlikely to be regarded as significant. The EEC is in poor condition, the tree layer has been substantially thinned and the shrub layer entirely removed. There is a significant component of weed and exotic species, notably serrated tussock grass.

The survey of the site recorded four threatened fauna species on the site or nearby:

- Speckled Warbler (*Pyrrholaemus saggttatus);*
- Eastern Bent-wing Bat (*Miniopterus schreibersii);*
- Eastern False Pipistrelle *(Falsistrellus tasmaniensis);* and
- Southern Myotis (*Myotis macropus*).

A further three fauna species listed under the *Threatened Species Conservation* (TSC) *Act* had the potential to occur or occasionally visit the site, such as the Black-chinned Honeyeater, Regent Honeyeater and Swift Parrot. Clearing native vegetation, loss of hollow bearing trees and removal of dead wood and dead trees are recognised as key threatening processes under the TSC Act. These practices would affect all native flora and fauna inhabiting the site. In addition there would be indirect effects on native flora and fauna extending beyond the area of land disturbance, arising from noise, dust, blasting and increased vehicle movement on the quarry site and proposed bypass road.

One endangered flora species, Hoary Sunray (*Leucochrysum albicans* var. *tricolor)* was recorded in the eastern part of the bypass road site, near an old tip site on Joarimin Creek Road. As the species was not recorded within the proposed alignment of the bypass road, the ecological report considered the local population of the species would not be expected to be adversely affected by the project.

In order to maximise the conservation of local flora and fauna species and mitigate impacts of the project, the ecological report recommended:

- maintenance of a buffer around watercourses;
- retention of habitat trees where possible and undertaking pre-clearance surveys of hollow trees to be cleared;
- active regeneration of degraded Speckled Warbler habitat and replanting of existing cleared areas to extend the habitat;
- exclusion of grazing from areas identified for regeneration;
- setting aside offset areas equal to (or greater than) the area of vegetation to be cleared for regeneration of native vegetation; and
- implementation of a vegetation and weed management strategy for remnant vegetation.

The DECC was concerned about: the adequacy of the survey information, in particular the identification of all native vegetation on the site and surveying of micro-bats, Glossy Black Cockatoo and the Gang-Gang Cockatoo; impacts on threatened species and EEC, and the adequacy of the vegetation offset. e same vegetation and habitat types that exist in the area to be disturbed. Gunlake states that the field survey of threatened species included two micro-bat species (Eastern False Pipistrelle and East-Coast Freetail-Bat), however, only probable calls of the Eastern False Pipistrelle were recorded. Based on the field survey results the EA considered that it was highly unlikely that a substantial population of either species occur on the quarry site. In the event that a roost site is discovered, potential imparts could be mitigated by the pre-clearance surveys of hollows, timing of clearing operations to avoid the breeding period and when bats enter torpor. The survey only recorded the speckled warbler at the old tip site near Joarimin Creek Road (to the east of the proposed bypass road). The EA concluded that the project is highly unlikely to result in the local extinction of the species as only a small area of potential habitat would be cleared from the bypass road site and the resulting area of potential speckled warbler habitat would remain well above its 100 ha threshold habitat area. Furthermore, the proposed offset and rehabilitation areas on the quarry site would increase the extent of habitat available to the speckled warbler in the area. In relation to tree hollow reliant fauna, the survey did not record the gang-gang cockatoo within the site nor evidence of gang-gang cockatoo nesting in the tree hollows and 2 dead stags on the quarry site. Gunlake has revised the number of tree hollows that would be cleared (from 43 to 31) and would undertake pre-clearance surveys of tree hollows for wildlife.

Gunlake has revised the area of vegetation that would be required to be cleared and increased the area of vegetation that would be fenced and managed as offset and compensatory planting areas. The area of native vegetation that would be cleared has been reduced from 8.8 ha to 5.22 ha, of which 4.19 ha is the Box-Gum Woodland EEC (see Table 5). The reduction has been achieved by shifting the irrigation areas to areas of open pasture (see Figure 7). Gunlake has also agreed to delete Irrigation Area B which is located in Offset Area 1.

Vegetation Community	Existing Area (ha)	Original Proposal (ha)	Revised Proposal (ha)	Remaining Area (ha)
Riparian Floodplain Woodland *	21.71	1.6	0.56	21.15
Open Woodland/Woodland *	21.72	6.2	3.63	18.09
Open Forest/Woodland - Argyle Apple/Stringbark	4.52	1.0	1.03	3.49
Total	**47.95**	**8.8**	**5.22**	**42.73**
Total EEC	**43.43**	**7.8**	**4.19**	**39.24**

Table 5 – Vegetation Communities on the Quarry Site

- *denotes Box Gum Woodland EEC*

The proposed offset areas have a total area of at least 76 ha and are to be fenced to prevent stock entry. Weed management is to occur in all of the offset areas with passive regeneration and supplementary replanting. The 3 offset areas would protect 30.38 ha of existing EEC vegetation and in addition, an area of 46.16 ha of cleared pasture land would be available for regeneration and replanting with EEC species. These areas would provide potentially up to 76 ha of existing and regenerated EEC vegetation, or 18 times the area of EEC vegetation to be cleared.

The Department is satisfied that the flora and fauna impacts of the proposal can be adequately compensated and managed and that the proposed offset package is adequate. However, the

Department believes that the various requirements for managing flora and fauna issues should be set down in detailed plans for managing the offset areas in perpetuity and managing flora and fauna within the quarry site during the period of quarry operations. These plans should incorporate:

- a Vegetation Clearance Protocol and other measures to be taken prior to commencing quarrying;
- protocols to minimise disturbance to offset areas during quarry operations;
- management methods for the offset areas, with details of proposed revegetation techniques;
- monitoring procedures for revegetation in the offset areas; and
- an obligation on the property owner after quarrying is complete.

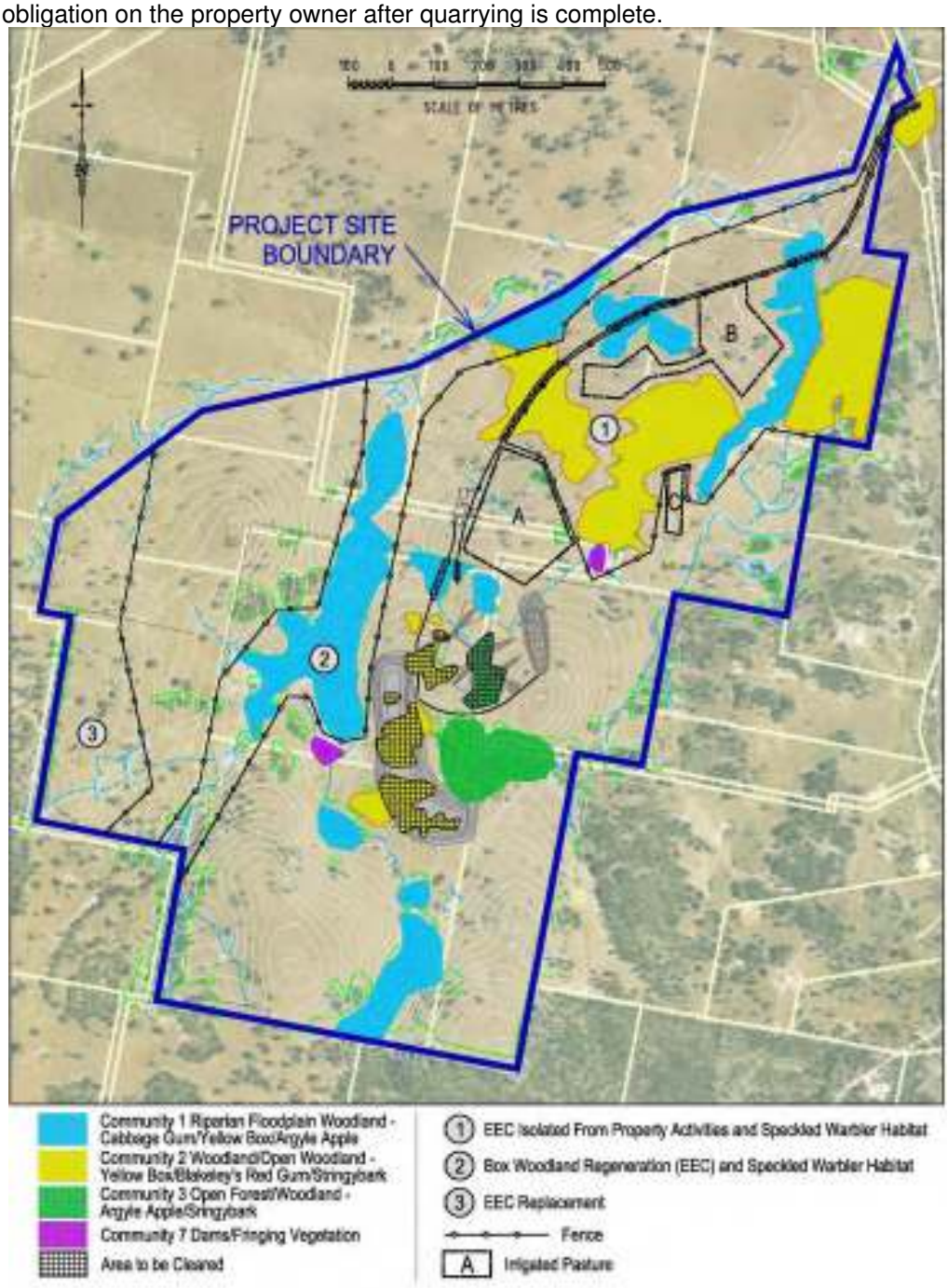

Figure 7 – Proposed Vegetation Offset Areas

4.6 Heritage

The cultural heritage assessment of the project was carried out with the D'harawal Knowledge Holders and the Pejar Local Aboriginal Land Council. The survey identified 5 archaeological sites, 3 on the quarry site (GL1, GL2 and GL3) and 2 in the vicinity of the unformed Crown road (GL4 and GL5). The sites consisted of 1 isolated find and 4 artefact scatters (see Table 6).

Site Name	Site Type	Site Details
GL1	Artefact scatter	6 artefacts on erosion scald on hill saddle
GL2	Artefact scatter	6 artefacts on gently sloping dirt track
GL3	Artefact scatter	4 artefacts on erosion scald on gently sloping ground
GL4	Isolated find	1 quartz flake on west bank of Joarimin Creek
GL5	Artefact scatter	2 artefacts on moderate hill slope

Table 6 – Archaeological Survey

The assessment considered the 5 archaeological relic sites possessed very low significance and the artefact types were well represented within the archaeological record of the region. The assessment considered that it was highly unlikely that additional information can be derived from the sites in accordance with the existing cultural evidence. The report recommended salvaging and relocation of the sites prior to the commencement of work and mitigation measures should further cultural heritage items and skeletal remains be discovered during construction of the project.

The DECC was concerned that the archaeological background of the cultural heritage assessment did not review all recorded Aboriginal sites in the area or considered recent archaeological survey results, and that the Aboriginal community had not commented on the cultural heritage assessment report. The DECC also recommended Gunlake prepare and implement an Aboriginal Heritage Management Plan for the project. Gunlake considers that the background review that was undertaken of recorded sites on the Aboriginal Heritage Information Management System was sufficient to enable the cultural heritage assessment to target/determine whether known archaeological material was located where it would be affected by the project and assist in interpreting any finds. The cultural heritage assessment fully described the archaeological material that could be potentially affected by the project. Gunlake states the cultural heritage consultants undertook a search for existing reports and were aware of surveys completed after the study but were not available at the time. Gunlake has provided evidence that the Pejar Local Aboriginal Land Council has endorsed the recommendations of the cultural heritage assessment.

A search of the heritage database for the Council area was undertaken, and apart from the Marulan Station and Yard Group and Old Marulan Township, neither of which are affected by the project, there were no heritage items within or near the quarry site and bypass road.

The Department is satisfied that the EA has addressed Aboriginal and non-Aboriginal heritage issues and recommends that Gunlake be required to prepare an Aboriginal Heritage Management Plan for the project.

4.7 Visual Impact

The topography of the area is undulating with cleared rural land interspersed with areas of vegetation. The proposed quarry site is not visible from Brayton Road or from adjacent residences to the east. A ridge along the eastern boundary effectively provides a visual screen for the quarry pit and processing area. Furthermore, the proposed out of pit overburden emplacement area to the east of the processing area would provide a vegetated bund wall to visually screen the quarry. However, distant glimpses (2-5 km) of the quarry may be available from isolated parts of private properties.

Vehicles entering and leaving the bypass road would be visible to residents in the immediate area near the intersection of the bypass road and Brayton Road, but the bypass road would not be visible as it is screened by vegetation. Distance views of vehicles using the bypass road may be available from the Hume Highway and local roads. The EA considers the views of vehicles using the bypass road would only be of general interest and not significantly different from the views being experienced by people travelling on the Hume Highway and local roads.

To mitigate potential visual impacts, Gunlake would:
- progressively rehabilitate the site to ensure cleared or non vegetated areas are minimised;
- provide an overburden emplacement to visually and acoustically screen the rock processing area; and
- ensure the height of the conveyor structures are below 10 metres to ensure they are screened by the topography and emplacement bund.

The Department is satisfied that the proposed mitigation strategies, while taking time to be fully effective would assist to lessen the visual effect of the quarry.

4.8 Other Issues

The Department has considered other issues relevant to the project and come to the view that there are no further matters of significance to be assessed and controlled in conditions of approval.

5 RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of approval for the Project. These conditions are required to:

- prevent, minimise and/or offset adverse impacts of the Project;
- set standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the Project.

A summary of the conditions of approval is provided in Appendix A and a full set of the recommended conditions appears in Appendix B. Gunlake has reviewed the recommended conditions and has accepted them.

6 CONCLUSION

The Department has assessed the project application, EA, submissions received and Gunlake's response to submissions and is satisfied that there is sufficient information available to determine the application.

The key issues identified in the assessment were noise and dust impacts, vegetation and traffic and traffic related impacts. Gunlake has amended the project to restrict truck movements through Marulan to daylight hours only between Monday and Saturday afternoon. To minimise the impact of product transportation on Marulan, Gunlake would construct a new road to allow the majority of quarry trucks to bypass Marulan. The Department is satisfied that the impacts of the project can be adequately mitigated, managed, offset and/or compensated for, to ensure an acceptable level of environmental performance.

An offset strategy has been proposed, which would protect over 30 ha of existing native vegetation, and regenerate and replant an additional 46 ha of pasture with EEC species, to a potential total of 76 ha of EEC habitat. This represents an offset of over 18 times the area of EEC vegetation that would be cleared by the project.

The Department also notes that the project would provide social and economic benefits by the creation of new employment for 45 people and $15 million of new investment. The project would also provide a valuable long term supply of hard rock aggregate for local and regional markets in the Sydney and Canberra region and Gunlake's own concrete operations.

Consequently, the Department considers the project is in the public interest and should be approved, subject to recommended conditions.

7 RECOMMENDATION

It is RECOMMENDED that the Minister:

- consider this report;
- approve the project application, subject to conditions, under section 75J of the *Environmental Planning and Assessment Act 1979*; and
- sign the attached project approval (Tagged B).

David Kitto
Director
Major Development Assessment

Chris Wilson
Executive Director

Sam Haddad
Director-General

APPENDIX A. SUMMARY OF THE CONDITIONS OF APPROVAL

The Department has recommended a number of conditions of approval, including requirements to:

- limit quarrying operations under the approval to 30 years;
- require certain road works be completed before the relevant product transportation levels can commence;
- obtain an approval from the Department of Lands prior to commencing work on the Crown roads;
- construct and on completion dedicate the new bypass road to Council as a public road prior to Stage 2 product transportation commences
- prepare and implement Monitoring Programs for Noise, Blasting and Air Quality to evaluate critical parameters and demonstrate compliance;
- prepare and implement a comprehensive Water Management Plan for the project to monitor and manage surface and groundwater impacts. The components of the Plan include:
  - a site water balance;
  - erosion and sediment control measures;
  - pasture irrigation monitoring; and
  - surface and groundwater monitoring;
- address the impacts on flora and fauna by progressively rehabilitating the mined area and implementing a comprehensive flora and fauna offset that sets aside and manages an adjacent area of at least 76 ha for conservation;
- prepare and implement a Landscape Management Plan to specify details of quarry closure and rehabilitation works and management of the vegetation offset areas, including a:
  - Rehabilitation and Vegetation Offset Management Plan; and
  - Quarry Closure Plan;
- upgrade the roads and intersection of the proposed transport route and implement other traffic safety measures to RTA and Council requirements;
- prepare and implement an Aboriginal Heritage Management Plan; and
- prepare an environmental management strategy, submit annual reports and conduct environmental audits in accordance with standard practices.
- establish a Community Consultative Committee for the project.

APPENDIX B. RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX C. CONSIDERATION OF ENVIRONMENTAL PLANNING INSTRUMENTS

State Environmental Planning Policy (Major Projects)

See discussion in Section 3.1.

SEPP No.33 – Hazardous and Offensive Development

A potentially hazardous industry is defined in SEPP 33 as an industry which, if it were to operate without employing any measures to reduce or minimise its impact, would pose a significant risk in relation to the locality to human health, life or property, or to the biophysical environment.

The EA indicates that the proposal is not potentially hazardous because no hazardous materials would be stored on site. Explosives used for blasting would be brought to the site on each occasion by blasting contractors.

Fuel and oil storage and refuelling facilities for the mobile quarry equipment would be bunded to ensure spillages are contained. Risk assessment under SEPP33 is not required because the criteria for the quantity of flammable liquids stored on-site and distance to the nearest residence are not triggered.

A potentially offensive industry is defined in SEPP 33 as an industry which, if it were to operate without employing any measures to reduce its impact, would emit a polluting discharge in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land.

The assessment of impacts contained in the EA indicates that the relevant assessment criteria would be met at all sensitive receivers. The Department is satisfied that the proposal is not a potentially offensive industry as defined in SEPP 33.

SEPP No 44 – Koala Habitat protection

Potential koala habitat is defined in SEPP 44 as areas of native vegetation where trees of the types listed in Schedule 2 of the SEPP constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. The EA indicates that of the trees listed in Schedule 2, only several individuals of one listed tree, Ribbon Gum, was recorded on the bypass road site near Joarimin Creek. However these few trees does not constitute 15% of the total number of trees in the upper or lower strata of the tree component. Therefore the area does not constitute potential koala habitat as defined in SEPP 44.

While the project area does not constitute potential koala habitat, the draft recovery plan for the Koala lists secondary food tree species and supplementary species used by koalas in the Central and Southern Highlands. Of these, 4 secondary food species (Argyle Apple, Blakely's Red Gum, Apple Box and Yellow Box) and 1 secondary species (Red Stringybark) were recorded in the quarry site and bypass road site. Consequently a search for evidence of koala activity was undertaken. The search did not observe any koala scats or other evidence of the presence of koalas on the project site.

SEPP No 55 – Remediation of Land

Contaminated land is defined in SEPP 55 to mean land in, on or under which any substance is present at a concentration above the concentration at which the substance is normally present in, on or under (respectively) land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment. There is no evidence that such contamination exists in respect of the quarry site and bypass road site, and no reason to suspect that the land may be contaminated, being part of a farming property and having been used for grazing. Although the bypass road is near a former tip, the proposed road does not disturb land occupied by the tip. Consequently it is considered SEPP 55 does not require any further consideration.

Drinking Water Catchments Regional Environmental Plan No. 1

The objective of the Drinking Waters Catchment REP is to ensure that developments within Sydney's drinking water catchments do not have a detrimental impact on the quality of drinking water supply. The REP requires a consent authority to consider whether a proposal would have a neutral or beneficial effect on water quality and be satisfied that the carrying out of the proposal would have a neutral or beneficial effect on water quality.

The Department is satisfied the proposal can be constructed and operated to ensure all water quality issues are contained within the project site and that proposed water quality management and mitigation measures would ensure that water discharged from the site does not affect downstream water quality. The SCA has advised the proposal would have a neutral or beneficial effect on water quality. The Department therefore believes the project is consistent with the REP.

Mulwaree Local Environment Plan 1995

See discussion in Section 3.2.

APPENDIX D. GUNLAKE'S RESPONSE TO THE SUBMISSIONS

See the attached CD-ROM.

APPENDIX E. SUBMISSIONS

See the attached CD-ROM.

APPENDIX F. ENVIRONMENTAL ASSESSMENT REPORT

See the attached CD-ROM titled *Gunlake Quarries Gunlake Quarry Project Environmental Assessment Report and, Appendices* (4 volumes), dated February 2008.