Continuation of Limesand Mining, Ocean Beach Quarry, Portion of Reserve A24913, Denmark

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Shire of Denmark

Report and recommendations
of the Environmental Protection Authority

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Summary and recommendations

The Shire of Denmark proposes to extend the existing quarry and crush limesand within an A Class Parkland and Recreation reserve vested in the Shire of Denmark. This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment on the environmental factors relevant to the proposal.

Section 44 of the Environmental Protection Act 1986 requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

Relevant environmental factors

Although a number of environmental factors were considered by the EPA in the assessment, it is the EPA's opinion that the following are the environmental factors relevant to the proposal, which require detailed evaluation in the report:

(a) vegetation communities - the direct impacts from clearing to mine the resource, associated with rehabilitation, environmental management and decommissioning;

(b) Declared Rare and Priority flora - in particular the Priority 2 species *Thomasia quercifolia*;

(c) landform - impacts on landform changes and visual amenity;

(d) groundwater quality - potential effects from soil contamination;

(e) road transport of the product - impacts on tourist and residential areas of Denmark;

(f) public health and safety - issues related to public access to the quarry site; and

(g) Aboriginal culture and heritage - a Management Plan for the protection of any sites.

The EPA has also provided advice in relation to alternative long term supply and demand of limesand.

Conclusion

The EPA has considered the proposal by the Shire of Denmark to mine limesand and concluded that it can be managed to meet the EPA's environmental objectives, provided that the conditions summarised in Section 4 and set out in detail in Appendix 1, are imposed.

Of the relevant environmental factors listed above the EPA considers that the key environmental factors associated with this proposal are landform and visual amenity, vegetation communities with respect to rehabilitation and road transport issues. The supply of and the demand for limesand is also a key issue for strategic consideration at State level.

Because of the sensitive location of the quarry site, successful rehabilitation is particularly important. The EPA has therefore recommended a condition requiring an annual performance review of rehabilitation for the first five years. If rehabilitation is found to be inadequate the EPA considers that approval to continue quarrying should be revoked.

The issue of demand for limesand is being predominantly driven by current farming practices. Application of lime is required to neutralise soils which tend to become increasingly acidic when used to grow crops. With acidity having the potential to compromise two thirds of the State's agricultural areas if left untreated, the problem of acid soils is potentially even bigger than salinisation. Accordingly, the EPA endorses the proposed development of a State Lime Supply Strategy for the orderly supply of limestone or limesand to address agricultural needs without undue impact on remnant vegetation or other environmental values.

The EPA understands that a steering committee involving the DEP, CALM, the Department of Minerals and Energy and coordinated by the Department of Resources Development has been formed to liaise closely with Agriculture WA and other involved agencies to prepare a strategy to ensure sufficient supplies of lime are available in environmentally appropriate locations for the State's needs. However, the EPA considers that more sustainable farming practices, which do not rely on the importation and application of lime, need to be developed and implemented in the longer term.

EPA has concluded that the proposal is capable of being managed in an environmentally acceptable manner such that it is most unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Section 4, including the proponent's commitments.

Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes that the project being assessed is for an expansion of a quarry for limesand in A Class Reserve 24913 vested in the Shire of Denmark for the purpose of parkland and recreation.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3;
3. That the Minister notes that the recommended conditions include a constraint on the annual amount of limesand quarried to a rate not exceeding 15,000 tonnes per annum.
4. That the Minister notes that the EPA has been concerned about rehabilitation work undertaken to date, and has included in the environmental conditions a requirement for an annual review of rehabilitation performance for the first five years, and thereafter every three years and the need for the rehabilitation to be satisfactory.
5. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 1, including the proponent's commitments.
6. That the Minister imposes the conditions and procedures recommended in Appendix 1 of this report.

Conditions

Having considered the proponent's commitments and information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the proposal by the Shire of Denmark to quarry limesand is approved for implementation. These conditions are presented in Appendix 1. Matters addressed in the conditions include:

(a) that the proponent be required to fulfill the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 1;
(b) a maximum quarrying rate of 15,000 tonnes per year;
(c) preparation by the proponent of an Environmental Management Plan which addresses, but is not limited to:
    - a schedule of progressive works to be carried out;
    - a rehabilitation plan which is used as the basis for mine planning and progressive rehabilitation;
    - re-contouring schedules and diagrams;
    - management of topsoil:- location, schedules for its removal and replacement;

- proposals to improve visual amenity;
- type and frequency of monitoring and proposed completion criteria for the proposed work above;
- parks and recreation reserve management to protect the values of the reserve surrounding the proposed quarry;

(d) preparation by the proponent of a Decommissioning Management Plan;
(e) the requirement for Rehabilitation Performance Reviews which are to be undertaken annually for the first five years and subsequently every three years;
(f) the requirement for an Aboriginal Sites Survey.

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1. Introduction

This report provides advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for Environment on the environmental factors relevant to the proposal by the Shire of Denmark to mine limesands. The proposal seeks to extend the current quarry, which is located on A Class reserve 24913 (for parklands and recreation) near the south end of Ocean Beach Road (Figure 1). Whilst application has been made for a mining lease, the excision from an A class nature reserve will require the concurrence of both Houses of Parliament. The Shire is pursuing this matter and hopes for an affirmative decision in the next few months. The Department of Land Administration (DOLA) would then be able to issue a Management Order to the Shire for the new reserve.

The proposed site is adjacent to the existing quarry which has been used for nearly 40 years. Annual production rates have varied greatly but in recent years were between 10,000 and 14,000 tonnes. The cleared area currently occupies approximately 3 hectares within the 554ha reserve. Other portions of the reserve have been utilised for the surf club, the Sea Rescue Group Headquarters, car parks and access roads.

The Ocean Beach limesand project was referred to the Environmental Protection Authority for assessment in 1996 in response to concerns about the quarry's location in sensitive dunes in the A class reserve, landform and visual amenity, public safety and noise, potential for groundwater contamination, environmental management and rehabilitation of the site. The level of assessment was set at Consultative Environmental Review (CER).

Final guidelines for the preparation of the CER were issued in May 1997 and the CER was released for four weeks public review in June 1998. The DEP received nine submissions on the proposal from six State government agencies and three conservation groups.

Further details of the proposal are presented in Section 2 of this report while Section 3 discusses environmental factors relevant to the proposal. The Conditions and procedures to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 provides Other Advice of the EPA, Section 6 presents the EPA's Conclusions and Section 7, the EPA's Recommendations.

Appendix 1 contains the recommended environmental conditions and the proponent's commitments; people and organisations that made submissions are listed in Appendix 2; and references comprise Appendix 3. Appendix 4 is a list of Priority and Declared Rare Flora species provided by CALM which might be expected to be found in the area and Appendix 5 contains Shire correspondence with the Aboriginal Affairs Department.

Appendix 6 contains a summary of the public submissions and the proponent's response. The summary of public submissions and the proponent's response is included as a matter of information only and does not form part of the EPA's report and recommendations. The EPA has considered issues raised in public submissions when identifying and assessing relevant environmental factors.

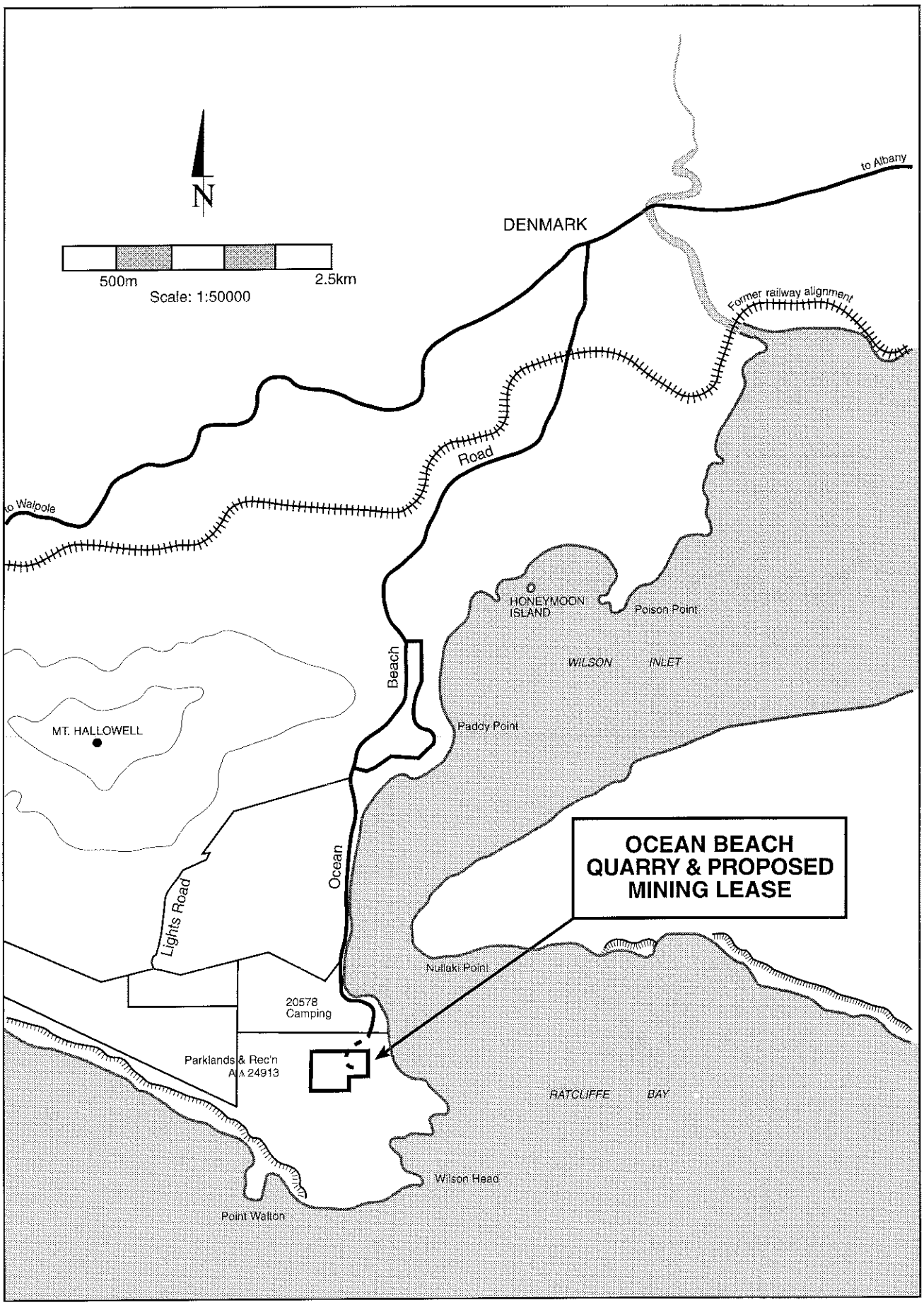

Figure 1. Location Plan.

2. The proposal

The proposal seeks to extend the current quarry operation, near the south end of Ocean Beach Road, to the west. Although it lies on or adjacent to the north flank of a high dune most of the quarry area would occupy a slight hollow. Whilst it is located some distance from the centre of the town of Denmark, the general area can nevertheless be seen from parts of Ocean Beach Road and higher residential areas, especially those in the vicinity of Mt Hallowell.

The proposed extension would require the clearing of a further 12ha of the reserve. To facilitate rehabilitation the pit is planned to be approximately 5 metres deep, although the reserves drilling programme indicated that a considerably thicker sequence of limesand and limestone exists in many of the exploration drillholes (Masters, 1993). The former quarried area at the east end is in parts 10+ metres in depth. The first grade resource (average 78.4% $CaCo_3$) is calculated at 257,800m^3 or 400,000 tonnes and at the proposed annual mining rate of 10,000 tonnes the quarry would have a life of about 40 years.

As described in the proponent's CER the current operation uses a front end loader for all the mining and loading. A bulldozer with a ripper attachment is used to break up more cemented areas. An excavator and truck could also be used within the quarry. The product is passed through a sieve/crusher before being stockpiled for sale and subsequent road transport to farms. Properties in the Shires of Gnowangerup, Katanning, Broomehill, Lake Grace, Cranbrook, Albany and Manjimup (up to 150km from the quarry) have obtained their supplies of limesand from here in the last year.

Truck sizes to transport the product vary from less than 10 tonnes up to semi trailers carrying over 42.5 tonnes. At the proposed quarrying rate of 10,000 tonnes per year and during the lime spreading season (approximately November to mid-March) the CER states that, on average, three truck movements per day are expected. As in the current operation, it is proposed to load and transport the product during daylight hours on any day of the week, excluding 8-9am and 3-4pm on school days. (Road trains are not permitted on Ocean Beach Road on public holidays.) The actual number of truck movements depends on several factors (for example, the quarry does not load trucks during wet weather and truck sizes vary considerably). These issues are discussed in more detail in Section 3.4.

Site infrastructure (as described in the CER) consists of an (existing) overhead power line to run the sieve and conveyor belt, dirt access road, loading ramp, open-sided storage shed and a fuel storage tank. At the time of the site visit there was no fuel tank or shed. Refuelling of earth-moving machinery currently takes place on site from a tanker truck which visits when necessary.

The operation would be tendered out, as is currently the practice, to be run on behalf of the Shire.

The proposal would encompass a formal rehabilitation programme. This would include parts of the former and current quarry operations and progressively rehabilitate worked-out areas of the proposed quarry. Areas would be contoured to prevent flooding and to restore natural grades as much as possible. Topsoil would be set aside for re-use and only vegetation species native to the site are proposed to be used. Formal monitoring would take place via annual inspections; remedial action would be taken as required and could involve additional seeding and planting. Weeds and rabbits would be controlled as part of the rehabilitation plan, which would itself be reviewed regularly to incorporate the results of monitoring and new information.

A summary of the key characteristics of the proposal is presented in Table 1. A detailed description of the proposal is provided in Section 6 of the CER (Shire of Denmark, 1998)

Table. 1. Summary of key proposal characteristics

Element	*Description*
Land tenure	Mining Lease application for excision from A Class reserve 24913 for parklands and recreation
Area	12ha.
Area of disturbance	up to 12ha.
Quarry depth / resource reserve	approximately 5m / 257,800m^3 of lime averaging 78.4% $CaCO_3$
Rate of clearing	up to 0.45ha/year, based on 15,000tpy production
Production rate	Ave.10,000 tonnes per year(tpy), 15,000tpy max.
Life of quarry	up to 40 years (at 10,000tpy)
Method of mining	front end loader, dozer with ripper as necessary
Processing	mobile sieve / crusher
Infrastructure	existing overhead power supply for crusher; gravel access road
Transport of product	by truck (sizes vary from <10t to >42.5t)
Frequency and timing of truck (carrying 42.5t and 10t resp.) movements for 15,000tpy	between approx. 5 and 23 daily during liming season (Nov. to March), up to 7 days a week, except between 8am to 9am and 3pm to 4pm on school days. Road trains not permitted on public holidays
Workforce	1-2

Since release of the CER, a number of modifications and clarifications to the proposal have been made by the proponent. These include:

- trucks transporting limesand from the quarry will not operate at night, nor between 8am to 9am and 3pm to 4pm on school days; in addition, in the case of road trains, not on public holidays. It is proposed to monitor trucks for frequency of movements, adherence to proposed speed restrictions on Ocean Beach Road and compliance with curfews on times of movements;
- as was foreshadowed in the CER, the Shire will allow the sale of lime product to buyers anywhere, rather than restricting it to "certain areas and local catchments which affect the Shire". The cost of transporting the limesand will be the limiting factor;
- the frequency and timing of truck movements is affected by several factors but may at times reach a maximum average of up to 23 a day (at an annual mining rate of 15,000tpy, over a period of 135 days and using 10 tonne capacity trucks-see Section 3.5).

3. Relevant environmental factors

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and the conditions and procedures, if any, to which the proposal should be subject. In addition, the EPA may make recommendations as it sees fit.

The identification process for the relevant factors is summarised in Table 2. Some of the environmental issues give rise to closely related relevant environmental factors. These are grouped together to avoid undue repetition.

Having considered appropriate references, public and government submissions and the proponent's response to submissions, in the EPA's opinion, the following are the environmental factors relevant to the proposal:

(a) vegetation communities - the direct impacts from clearing to mine the resource, associated with rehabilitation, environmental management and decommissioning;

(b) Declared Rare and Priority flora - in particular the Priority 2 species *Thomasia quercifolia*;

(c) landform - impacts on landform changes and visual amenity;

(d) groundwater quality - potential effects from soil contamination;

(e) road transport of the product - impacts on tourist and residential areas of Denmark;

(f) public health and safety - issues related to public access to the quarry site; and

(g) Aboriginal culture and heritage - a Management Plan for the protection of any sites.

Details of the relevant environmental factors and their assessment are contained in Sections 3.1 - 3.7. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal. Submissions to the CER are summarised and discussed before the EPA's assessment and conclusions on whether the proposal will meet the EPA's objective for each relevant factor.

Details on the relevant environmental factors and their assessment is contained in Sections 3.1 - 3.7. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal.

The assessment of each factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

A summary of the assessment of the environmental factors is presented in Table 3.

Table 2. Identification of Relevant Environmental Factors

Factor	*Proposal characteristics*	*Government agency and public comments*	*Identification of relevant environmental factors*
BIOPHYSICAL			
Vegetation Communities	The Quarry is in an A class Parklands and Recreation Reserve vested in the Shire of Denmark. The vegetation is a single unit of dune scrub and thickets of peppermint. 12 hectares of vegetation will be directly impacted by the proposal. The current operation has introduced weeds into the reserve.	**Government** Commissioner for Soils and Land Conservation: • notification of clearance of >1 hectare of native vegetation for a change in land use is required at least 90 days prior to the intended commencement of clearing; • land degradation should be addressed ; • the Commissioner should comment on the appropriateness of conditions of approval set by the EPA; • need for a provision such that during high intensity rainfall events, water, or water-borne soil material does not leave the site in a concentrated manner and cause off-site damage. **Public** The Denmark Conservation Society questioned the value of the flora survey which was conducted over two months.	A mining lease of 12ha is proposed within the A Class reserve of 554ha. Most, if not all, of the 12ha would be cleared. **Considered to be a Relevant Environmental Factor**
Declared Rare and Priority Flora	Several *Thomasia quercifolia* shrubs, a Priority 2 species, have been recorded in the proposal area.	No comments received.	Acting on CALM advice a search was made for several species known to inhabit coastal limestone areas in the region. **Considered to be a relevant factor.**
Terrestrial Fauna	Specific local records are sparse and the exact distribution of many species is not known. The site is considered to be a single habitat of dune scrub and thickets on shallow sand over limestone. 12ha of habitat will be directly impacted by the proposal.	**Public** Denmark Conservation Society: • questioned the value of the fauna survey which was conducted over two months; • highlighted one sentence in this section of the CER: 'No useful comments can be made on invertebrate fauna.'	No rare or endangered fauna have been recorded. **Not considered to be a relevant factor.**
	Specially Protected (Threatened) Fauna	None has been recorded. No comments received.	**Not considered to be a relevant factor.**

Factor	*Proposal characteristics*	*Government agency and public comments*	*Identification of relevant environmental factors*
Landform	Coastal dune system. The site is on the inland side of a large ridge of windblown sand which has become cemented to form coastal limestone. The quarry has been operating for nearly 40 years, resulting in the clearing of 3 hectares of native vegetation.	**Government** Water and Rivers Commission: • rehabilitation using stockpiled topsoil should be considered when preparing a rehabilitation plan; • the search for alternative uses for the existing deep quarry is supported. Future rehabilitation proposals for the existing quarry should be referred to the Commission for comment. **Public** Denmark Conservation Society: • the Shire should be required to utilise suitably experienced personnel to achieve the appropriate standard of rehabilitation; • what little rehabilitation has been done involves exotic vegetation - including weeds; • ongoing works have resulted in an increasingly visible scar on the landscape and the possible loss of valuable seed and brush material; and • strongly opposes expansion of the quarry or mining lease areas beyond the currently-approved extension. Conservation Council of Western Australia: • concerned about the current standard of rehabilitation. Believes that commitments to rehabilitation need careful assessment and, if allowed to proceed, careful monitoring; • a requirement for expert assistance should be built into the conditions, given this area is within an A class Reserve; and. • the EPA should also require the proponent to address existing rehabilitation needs. Denmark Environment Centre: • stresses the importance of regeneration of the site to A class Reserve status following extraction of the resource; • revegetation commitments at this site have not been adhered to in the past; and • the EPA must clearly require the Shire of Denmark's rehabilitation commitments to include the full utilisation of appropriately experienced personnel in achieving an appropriate standard.	Aspects of the project which are closely associated with landform include bench stability, visibility, topsoil management and replacement, surface runoff and progressive rehabilitation. **Considered to be a Relevant Environmental Factor**

POLLUTION			
Factor	***Proposal characteristics***	***Government agency and public comments***	***Identification of relevant environmental factors***
Ground-water quality	The limestone site is porous and free draining. The water table has not been encountered in excavations. The proposed excavation will be half as deep as the current quarry.	**Government** Water and Rivers Commission: • potential for groundwater contamination as a result of fuel or oil spills. This threat could be addressed through contract requirements and controls (CER p18); • any above-ground fuel storage facility should be constructed and operated in accordance with the Commission's *Guidelines for the Siting and Installation of Above Ground Bulk Chemical Facilities*; • the servicing of mechanical components involving liquids should not occur on site, unless the site manager can demonstrate implementation of an effective system for the capture and export of such liquids for recycling of approved disposal products; and • the CER does not address stormwater management on the site. The site should be managed so that stormwater runoff is retained on site.	**Considered to be a Relevant Environmental Factor**
Noise	The quarry lies approximately 1km from the nearest private property.	No submissions regarding noise from the quarry were received.	The quarry must comply with relevant noise regulations. **Factor does not require further evaluation**
Dust	Although quarrying of the product is a potentially dusty operation there appears to be minimal indication of impacts from dust on adjacent vegetation in relation to the current operation.	No submissions regarding dust from the quarry were received.	Quarry dust is addressed by legislation administered by the Department of Minerals and Energy. **Not considered to be a relevant environmental factor**
SOCIAL SURROUNDINGS			
Visual Amenity	The current cleared areas along the south rim of the quarry site contrast with dark green vegetation seen from Ocean Beach Road and from more distant locations in elevated areas of the township. Parts of the proposed area are likely to also be visible unless carefully screened.	**Public** Denmark Environment Centre: • strongly opposes any future extension of the mine pit or mining lease areas beyond the proposed expansion; and • the old part of the quarry requires immediate regeneration to mitigate the current visual impact. The visual impact of the quarry has escalated. It is now highly visible from Ocean Beach Rd and most elevated parts of the Denmark townsite.	**Considered to be a Relevant Environmental Factor.**

Factor	*Proposal characteristics*	*Government agency and public comments*	*Identification of relevant environmental factors*
Aboriginal Culture and Heritage	Clearing and quarrying operations at the minesite may destroy unknown sites unless a survey outlines their locations and suggests strategies to avoid them or minimise impacts.	**Government** • Aboriginal Affairs Department advice received subsequent to original submission to indicate that monitoring during ground disturbing activities and strategies to protect any sites discovered should be a part of an EMP for the proposal. • Department of Minerals and Energy (DME) indicated that the Shire of Denmark has yet to enter the Native Title process. **Public** In undated correspondence to the Denmark Conservation Society the Aboriginal Affairs Department records the existence of one known Aboriginal site, Katelysia Rock Shelter, and acknowledges the possibility of other, unrecorded sites.	The proponent has indicated in the CER that a survey is required and that, if any sites are found, it will be necessary to follow the provisions of the Aboriginal Heritage Act. Katelysia Rock Shelter is understood to be outside of the proposed area. **Considered to be a Relevant Environmental Factor.**
Road transport	Truck movements along the main road for carting of the product occur for 4 months of the year from mid-November till March, up to seven days a week, past homes and along a popular beach access route. At an annual mining rate of 15,000 tonnes this amounts to around 5 truck movements per day, assuming 42.5t per load, or approx. 23 truck movements per day for 10t loads.	**Public** Denmark Conservation Society: • 24-hour use of the road by heavy vehicles disturbs adjoining residents and creates dust and noise nuisances; and • the truck movement figures presented hold true for the tonnage being removed from the pit, assuming an average load weight of 30t. However, the figure fails to recognise that truck movements are two-way, and are therefore double the number and frequency presented.	The route used by trucks is narrow near the inlet mouth. Widening it would be expensive and impractical, both from an engineering and an environmental perspective. **Considered to be a Relevant Environmental Factor**

Factor	*Proposal characteristics*	*Government agency and public comments*	*Identification of relevant environmental factors*
Public Health and Safety	Relates to aspects of the former quarry which has steep to vertical sides; and to lime truck movements along Ocean Beach and other roads	**Government** Water and Rivers Commission: • the access road to the quarry is an extension of Ocean Beach Road and is heavily used throughout summer. Conflict of road users exists and it is considered that if quarry activities increase, conflict with recreational beach users may also increase. Truck movements should be monitored and reviewed periodically to determine whether further road restrictions are required. Department of Minerals and Energy: • the public safety aspect of the existing quarry is adequately addressed. The Shire of Denmark must maintain the fencing. **Public** Denmark Conservation Society: one of the major social impacts of current operations at the quarry is inherent in the quarry's location, at the end of a narrow winding section of public road. Road trains operating around the clock 'in season' (November - May) coincide with high traffic volumes of tourists and others using the road to access the popular Ocean Beach, increasing the risk of accidents.	**Considered to be a Relevant Environmental Factor**

Table 3. Summary of assessment of Relevant Environmental Factors

Relevant Factor	*Relevant Area*	*EPA Objective*	*EPA Assessment*	*EPA Advice*
Vegetation communities	The 12ha of native vegetation proposed to be excised from the reserve and cleared.	Maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities.	The landform, vegetation and flora are common along the coast and are well represented in conservation lands. The small area of the quarry compared to the reserve (12/554ha) is part of up to 25km of coastline with similar vegetation in conservation reserves between West Cape Howe and the Kent River (using Beard's mapping divisions and the extent of CALM estate as shown in CALM 1992).	Having particular regard to: • the proponent's commitment to progressive quarrying, stockpiling of removed topsoil, rehabilitation using appropriate species of native vegetation, weed and rabbit control; • the proponent's commitments in its rehabilitation plan for the former quarry; and • the recommended conditions requiring the proponent to prepare an environmental management plan and a de-commissioning and rehabilitation plan to the requirements of the EPA; it is the EPA's opinion that the proposal can be managed to meet its objective for this environmental factor, provided that the EPA's recommended conditions and the proponent's commitments are legally enforceable.
Declared rare and Priority flora- *Thomasia quercifolia,* Priority 2	Preliminary estimate is an area of approx. 500m^2	Protect Declared Rare and Priority Flora, consistent with the provisions of the Wildlife Conservation Act 1950	This shrub has been discovered as a result of a flora survey subsequent to the preparation of the CER. Its distribution outside the area of the proposal is currently thought to be very restricted. This will require a specific commitment or condition to protect the shrubs and is to be addressed in the forthcoming EMP.	Having particular regard to: • the recommended conditions requiring the proponent to prepare an environmental management plan; • the requirement to comply with the Wildlife Conservation Act; it is the EPA's opinion that the proposal can be managed to meet its objective for this environmental factor, provided that the EPA's recommended conditions and the proponent's commitments are legally enforceable.
Landform and Visual amenity	The 12ha of native vegetation proposed to be excised from the reserve and cleared.	Establish a stable, sustainable landform consistent with surroundings. Visual amenity of the area after rehabilitation, and of the adjacent area, should not be unduly affected by the proposal.	The proposed expansion to the current quarry will occur in a slight depression so that visibility of the quarry area from points to the north (town of Denmark and Mt Hallowell) will be reduced. In addition, the proponent's rehabilitation plan includes placing a mound and planting a screen of trees along the north lip of the quarry, and for progressive revegetation to occur in the quarry and along the surrounding lip.	Having particular regard to: • the location of the quarry in a dip; • the proponent's commitment for screen planting and rehabilitation with appropriate native species; and • the recommended conditions requiring the proponent to prepare an environmental management plan and a decommissioning and rehabilitation plan to the requirements of the EPA; it is the EPA's opinion that the proposal can be managed to meet its objectives for these environmental factors, provided that the EPA's recommended conditions and the proponent's commitment are legally enforceable.

Relevant Factor	*Relevant Area*	*EPA Objective*	*EPA Assessment*	*EPA Advice*
Ground-water quality	The area of the quarry, and ground-water moving down-gradient away from the quarry.	Maintain or improve the quality of groundwater to protect existing and potential uses, including ecosystem mainten-ance.	Equipment on site requiring fuel and oils is limited to a truck, front end loader and bulldozer. An onsite fuel storage tank will be placed in a bunded area. The Water and Rivers Commission "Guidelines for siting and installation of above ground bulk chemical facilities" will be complied with. Any contaminated soil arising from fuel and oilspills will be removed.	Having particular regard to: • the proponent's commitment for the prevention or management of spills; it is the EPA's opinion that the proposal can be managed to meet its objectives for these environmental factors, provided that the proponent's commitment is legally enforceable.
Road transport	Relates to truck move-ments along Ocean Beach Road and through town of Denmark en route to farms.	Ensure that noise levels meet acceptable standards and that an adequate level of service, safety and public amenity is maintained.	Truck movements are restricted to daylight hours, with no carting between 8-9am and 3-4pm on school days, nor on public holidays for road trains. There are speed restriction humps near the intersection of the quarry access road with Ocean Beach Rd. Lime carting occurs only during the lime spreading season (Nov. to mid-March) with the average number of truck movements calculated at between 3.5 (all 42.5t trucks and 10000tpy) and 22.2 per day (all 10t trucks and 15000tpy)	Having particular regard to: • the proponent's commitment to restrict truck movements; • speed controls near the south end of Ocean Beach Rd; and • the relatively low number of truck movements on average ; it is the EPA's opinion that the proposal can be managed to meet its objective for this environmental factor, provided that the proponent's commitments are made legally enforceable.
Aboriginal culture and heritage	The 12ha area proposed to be cleared for quarrying	Ensure that the proposal complies with the require-ments of the Aboriginal Heritage Act 1972.	The register of sites at the Department of Aboriginal Affairs indicates none is known in the proposed area., however a ground survey is required. The Department of Aboriginal Affairs (DAA) in Albany has suggested that, if preferred, the survey could be carried out incrementally at the time of progressive clearing for quarrying.	Having particular regard to: • the proponent's commitment to undertake a survey; • the advice of the DAA; and • the recommended condition requiring the proponent to prepare a management plan for the protection of aboriginal sites; it is the EPA's opinion that the proposal can be managed to meet its objective for this environmental factor, provided that the EPA's recommended condition and the proponent's commitment are made legally enforceable.
Public health and safety	The area of the former and proposed quarries and the access road.	Ensure that the safety of the public is not comprom-ised	The walls of the former quarry are steep to vertical and about 10m high. Cutting them back to reduce the steepness is inappropriate because of the extra area required beyond the present quarry, and its high visibility. The proponent has committed to install fencing along the top of the quarry, supplemented by planting of appropriate native vegetation. Existing bunding along the northern wall of the quarry will be left in place. The proposed quarry will be shallower and run to the safety requirements of the DME	Having particular regard to: • the proponent's commitment to make the former and proposed quarries safe to the requirements of the DME; and • the recommended conditions requiring the proponent to prepare an EMP and a de-commissioning and rehabilitation plan to the requirements of the EPA; it is the EPA's opinion that the proposal can be managed to meet its objective for this environmental factor, provided that the EPA's recommended conditions and the proponent's commitment are made legally enforceable.

3.1 Vegetation communities

Description

The progressive development of the quarry westwards from the current site will require the phased clearing of 12 hectares of native vegetation.

A vegetation and flora survey was carried out for the proponent in August and September 1997. As the work spanned only two visits in spring it was described in the CER as an incomplete survey, with species other than perennials likely to be recorded if surveys were to be done at other times of the year. The vegetation consists of 67 native species and 25+ species of weeds. The weeds include common farm species and others usually associated with disturbed areas. They are predominantly confined to the cleared areas of the site, the remainder of which is described as being in excellent condition. It was stated in the CER that no rare plant species were present, that the vegetation and flora are common along the coast and (the CER cites a CALM 1992 report) that they are well represented in conservation lands.

The vegetation has been grouped into a single unit of dune scrub and thickets dominated by small Peppermints, Parrot Bush and shrubs forming clumps up to 3m tall. Between the shrub clumps there is usually a heath of shrubs less than a metre high, scattered sedges and herbs, with no dominant species. There are also more open patches with the most common shrub being dwarf sheoaks and greater numbers of small shrubs, sedges and herbs. There is little evidence of grazing damage, minimal weed invasion and the site is not prone to dieback infection. However, around the existing quarry, there is a ring up to 10 metres wide of partially cleared land from which topsoil was removed many years ago. This supports sparse natural revegetation which is poor in comparison to elsewhere on the reserve. Weeds occur in this area but are not dominant.

Submissions on the CER

If the area is designated a mining lease, then the conditions of operation would provide mechanisms to monitor and review ongoing mining, rehabilitation and environmental impacts. The Management Order from DOLA on the new mining reserve could incorporate management and land care conditions adapted from the Shire's commitments as summarised in the CER. If the proposal is approved, these provisions, together with the Minister for the Environment's conditions of approval and any set by the DME are expected to ensure that quarry operations will proceed responsibly in the future.

Submissions indicate that, whilst there is relief that the EPA and the DME will be able to set conditions for the satisfactory operation and rehabilitation of the quarry, the ultimate success of the operation will depend on how well the conditions are applied and enforced.

The Commissioner for Soils and Land Conservation stated that a notification of clearing is required for areas of native vegetation larger than 1ha.

It was noted that the flora survey had been conducted over a short period in spring and that consequently a number of species which are more evident at other times of the year may have been missed. Emphasising that there has been inadequate rehabilitation during the former period of operations several submitters wished to ensure the preparation of, prior to the project proceeding, a comprehensive integrated environmental management plan and mining plan. This should, amongst other things, address topsoil protection, minimise disturbance and manage pit wall slopes for stability. Local expertise should be used wherever possible.

Concerns were expressed about any delays in respreading stockpiled topsoil as the viability of contained seed is reduced progressively over time.

Submitters also want a programme to be developed for the former pit, and the Shire has committed to develop, with full community consultation, such a plan for the end use of the former quarry. A preference has been expressed for the steep southern face of the former pit to not be cut back to reduce the slope as this would involve the loss of considerably more vegetation and would be highly visible from areas to the north. With respect to the final land use the Water and Rivers Commission supports the search for alternatives, with its own preference being to have the site backfilled with inert fill. However, any fill would need to be quarantined or otherwise sanitised before being allowed to be used and a strategy to prevent unauthorised dumping would be necessary.

Expert assistance, careful monitoring and regular reporting/reviews would be required to ensure that the above plans were carried out effectively.

Assessment

The area considered for assessment of this factor is the 12ha proposed to be successively cleared for quarrying.

The EPA's environmental objective for this factor is to maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities. Key issues for the EPA's consideration are: (1) the principle of mining in A Class reserves; (2) the protection of rare and priority flora-(refer to Section 3.2); (3) the conservation of the vegetation associations of the dunes; and (4) the likely success of rehabilitation. The issue of mining in A Class reserves is discussed more fully in Section 5 under "Assessment".

In assessing this proposal, the EPA also considered that there was a need for a rehabilitation programme to be developed for the former quarry, as did a number of people who made submissions. This rehabilitation programme was required to be developed and submitted to the EPA as part of its assessment of the proposal to continue mining to the west. The rehabilitation programme has been developed by the Denmark Environment Centre (DEC) working in consultation with the Shire. The DEC raised several concerns in its submission to the Shire's CER. It is commendable that a cooperative approach has been adopted by the Shire and members of the community to achieve a desirable outcome for the greater benefit of the region.

Subsequent to the publication of the CER the Shire modified its commitment on rehabilitation of the former pit to be more specific about aspects of the revegetation and the timeframe for implementation. An extensively expanded list of commitments is provided in Appendix 1.

The CALM Priority Flora database for the location "Denmark" lists fourteen species. Some of these are associated with calcareous dune sands and may in fact exist in the area, but were not in evidence at the time the survey was carried out. However, the landform, vegetation and flora are common along the coast and well represented in conservation lands. The 12 hectares of the proposed quarry compares with the 554ha of the reserve A24913, which is itself located within a 25 kilometre stretch of conservation reserves with similar vegetation between West Cape Howe and the Kent River.

For the proposed extension the Shire proposes to revegetate the site using native vegetation. A detailed rehabilitation plan will be developed, with key elements being the progressive re-use of topsoil, re-contouring, supplementary seeding and planting, rabbit and weed control and monitoring.

The EPA has recommended a condition which requires an environmental management plan to be submitted and approved prior to the commencement of ground-disturbing activity. The intention is for the EMP to incorporate the Shire's proposed rehabilitation plan. The EMP should indicate the final landform and rehabilitation design and how the mine plan has been developed for progressive rehabilitation and achievement of the final landform. If approval is given for the quarry to proceed the EPA recommends regular checks be made, the first formal review being 12 months after startup. It should be necessary to demonstrate a satisfactory performance in this initial period to allow continuation of the quarry's operation. Further formal reviews are recommended to be held annually for five years and subsequently at three year intervals, with interim visits by DEP and DME staff. In addition the EPA has recommended the preparation of a decommissioning plan at least six months prior to closure of the quarry.

The EPA believes that, with appropriate planning, management of topsoil resources and careful monitoring, the proposed rehabilitation has a very good chance of success. Rainfall is high, there is good quality undisturbed dune vegetation adjacent to the area to act as a seed source and there is only moderate pressure from grazing animals. The proposed rabbit and weed controls will play an important part in the overall success of the programme.

Summary

Having particular regard to the proponent's commitments for:

(a) the proponent's commitments for:

- progressive quarrying;
- effective topsoil management;
- rehabilitation using appropriate native species;
- weed and rabbit control;
- rehabilitation of the former quarry; and
- monitoring of rehabilitation works, with follow up work where necessary; and

(b) the EPA's recommended conditions regarding an EMP, progressive implementation of rehabilitation, and a decommissioning plan;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for vegetation communities.

3.2 Declared Rare and Priority Flora

Description

The vegetation and flora survey carried out for the preparation of the CER spanned only two visits in spring and was described as an incomplete survey, with species other than perennials likely to be recorded if surveys were to be done at other times of the year. Advice was sought from the CALM office as to what Declared Rare or Priority Flora species might be expected to be found in a coastal limestone /dune environment. CALM responded (Appendix 4) with a list of ten Priority Flora.

Submissions on the CER

There were no submissions received on this environmental factor.

Assessment

The area considered for assessment of this factor is the 12ha to be excised from the reserve.

The EPA's environmental objective for this factor is to protect Declared Priority Flora consistent with the provisions of the *Wildlife Conservation Act 1950*. The CALM list of Priority and DRF species was passed on to the Shire for a specific check to be made as part of the environmental management plan which has been recommended as a condition of approval for the proposal.

A subsequent search of the proposed area by the proponent has recently found several *Thomasia quercifolia* shrubs (a Priority 2 species) within an area of about 500m^2 in the area proposed to be mined. This species is recorded growing in a few locations in coastal limestone from Walpole to Albany (CALM Roger Hearn pers. comm., 15.4.99). Its Priority 2 classification means that it is a poorly known species, from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat.

The Shire has committed to protection of the shrubs and has written that the specific steps to achieve this will be addressed in the environmental management plan to be prepared for the mining and environmental management of the area proposed to be mined.

Summary

Having particular regard to the proponent's commitment to address protection of this shrub species in the environmental management plan, which is a recommended condition of approval for the proposed mining area, it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for Declared Rare and Priority Flora.

Summary

Having particular regard to the proponent's commitment to address protection of this shrub species in the environmental management plan, which is a recommended condition of approval for the proposed mining area, it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for Declared Rare and Priority Flora.

3.3 Landform and Visual Amenity

Description

The proposal will require clearing of native vegetation and the creation of a new landform covering up to 12ha. The site lies in a slight depression, much of which is unable to be seen from areas to the north (ie the town of Denmark).

Submissions on the CER

Concerns were raised that proposals to expand the current pit would create an increased visual impact. It was stated that the operations to date have resulted in significant degradation of the ecology of the reserve and that any further expansion would constitute an unacceptable incursion on this coastal landscape.

The lack of effective rehabilitation of the former quarry was cited as an example of the potential damage which could occur with the new proposal if an appropriate rehabilitation/environmental management plan is not formulated prior to startup, and carried

out. It should address the use and appropriate management of stockpiled topsoil (to maximise the viability of contained seedstock) and quarry walls, bearing in mind that the landscape was shaped by the prevailing winds. Regular reviews of the progress of rehabilitation and appropriate updates to the EMP are sought.

A plan to reduce the visual impacts of the former quarry was requested. It was submitted that management of the exposed southern face should invoke minimum disturbance of the surrounding vegetation except for the application of clean, appropriately sourced topsoil to expedite rehabilitation. A preferred option would be to backfill the site with inert fill, as discussed in the CER. Any fill proposed for the former quarry should be quarantined or otherwise sanitised before being used. Fill should be concentrated against the walls to minimise the slopes. A closure date to prevent unauthorised dumping of fill (to prevent undue disturbance and the spread of weeds) and dates for stages in the progress of rehabilitation should be negotiated.

Rehabilitation should be carried out by suitably experienced personnel including the Shire's nursery manager and the Denmark Environment Centre.

A request was made for provisions to ensure that, during high intensity rain events, water and water-borne soil material do not leave the site in a concentrated manner and cause offsite damage.

If the area is designated a mining lease the conditions of operation would provide mechanisms to monitor and review ongoing mining, rehabilitation and environmental impacts. The Management Order from DOLA on the new mining reserve could incorporate management and land care conditions adapted from the Shire's commitments as summarised in the CER. If the proposal is approved, these provisions, together with the Minister for the Environment's conditions of approval and any set by the DME are expected to ensure that quarry operations will proceed responsibly in the future.

Submissions indicate that, whilst there is relief in the community that the EPA and the DME will be able to set conditions for the satisfactory operation and rehabilitation of the quarry, the ultimate success of the operation will depend on how well the conditions are applied and enforced. The ongoing key role of agencies such as the DEP, Department of Minerals and Energy (DME) and CALM in ensuring that conditions of approval are complied with was highlighted.

Assessment

The area considered for assessment of these factors is the 12ha to be progressively quarried over the life of the project and the view shed for the quarry.

The EPA's environmental objectives for these factors are: to establish a stable, sustainable landform consistent with the surroundings; and for the visual amenity of the area of the quarry and its surroundings not to be unduly affected by the proposal.

It is clear that a mine plan is needed to allow proper management and sequencing of the proposed pit. A necessary component of that Plan is start and completion dates for the various stages of work proposed.

The quarry would be considerably shallower than the former pit (5m versus >10m), and the creation of tall, steep to vertical faces would be avoided. Together with a well planned and executed environmental management programme, this would enable easier rehabilitation. The proponent intends to re-contour the proposed pit and revegetate it with appropriate native

species, paying particular attention to screening of the former and proposed quarries with appropriate native vegetation (the taller shrubs which grow on the area) around the top.

The site is free-draining and water does not run off cleared surfaces to any significant degree. The current access road, which is hidden from view because of overhanging shrubs and trees, would continue to be used. Despite its position on the slope of the dune it showed no signs of runoff and erosion at the time of the DEP's visit.

Summary

(a) the proponent's commitments for the former pit area; and

(b) the EPA's recommended conditions regarding an EMP, progressive implementation of rehabilitation, and a decommissioning plan;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for landform and visual amenity.

3.4 Groundwater quality

Description

Any activity which contaminates the soil could ultimately contribute to increased levels of groundwater pollution. The proposed quarry is not expected to intersect the water table (it was not reached in the deeper former quarry) but oil or fuel spills and leaks from machinery in the quarry, if not dealt with responsibly, could in time infiltrate to the water table.

Submissions

The Water and Rivers Commission (WRC) noted that the CER referred to management of spills via appropriate contract requirements and controls. The WRC wants any above-ground fuel storage facility to be constructed and operated in accordance with its Guidelines for the Siting and Installation of Above Ground Bulk Chemical Facilities. It stated that the servicing of machinery involving liquids such as coolants, hydraulic oils, brake fluid or lubricants should not occur on site unless there is an effective system for the capture and export of such liquids for recycling or approved disposal.

Assessment

The area considered for assessment of this factor is the area of the former and proposed quarries and subsurface areas down the hydraulic gradient.

The EPA's environmental objective for this factor is: to maintain or improve the quality of groundwater to ensure that existing and potential uses, including ecosystem maintenance, are protected.

In the CER the proponent committed to store fuel in appropriately bunded areas, manage the potential for fuel and oil spills, remove any contaminated material should a spill occur, and hand clear or selectively use herbicides in the disturbed area of the quarry when weeds colonise. Subsequent to the submission from the WRC the Shire has amended its commitment to include compliance with the WRC's abovementioned guidelines, which require the storage area to be sealed and bunded.

Stormwater on the sloping access road to the site needs to be managed. No problems were evident during the site visit.

Summary

Having particular regard to:

(a) the proponent's commitment to abide by the Guidelines for the Siting and Installation of Above Ground Bulk Chemical Facilities;

(b) the proponent's method of management of contaminated material should a spill occur; and

(c) sensitive weed management practices;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for groundwater quality.

3.5 Road transport

Description

The movement of trucks carrying lime product along Ocean Beach Road is related to road safety, particularly because the southern end of the road during summer carries holiday traffic (in cars and on foot from the nearby caravan park). The summer period coincides with the lime transporting season.

Submissions

It was stated that road trains carrying limesand could be operating in season around the clock. As well as creating noise, the passage of trucks generates dust, and it was claimed that various Shire Councillors had received complaints about quarry traffic, despite the statement in the CER that no complaints had been received. Ocean Beach Road is winding and in places narrow, especially near its southern end where it is constricted between an arm of the inlet and limestone cliffs. Quarry trucks share the road with tourist traffic at times, increasing the risk of accidents. The CER stated that hours of trucking would be restricted.

In response to a request for more detail about truck movements the proponent has indicated that:

- the quarry is never used at night. Truck movements for the quarry will occur during daylight hours only;
- trucks will be restricted to outside the times when school buses are on the road on school days (8-9am and 3-4pm);
- road trains are not allowed on public holidays;
- a speed restriction of 60km/h will apply over the full length of Ocean Beach Road; and
- the Shire has placed traffic calming devices (speed humps) near the narrow south end of the road where there are pedestrian movements. A 30km/h limit has been signposted near these recreational areas. Since the new restrictions have been imposed the Shire states that no further complaints about quarry-related traffic have been received at its office.

A submitter queried the stated number of truck movements in the CER, in which up to 3 per day/400 per season was quoted. It was claimed that this number should have been doubled to reflect truck movements each way. In its response the Council recalculated movements (ie 2

movements to one round trip) to be around 4 per day (actually 4.4, based upon a liming season of six months, for an annual rate of 10,000 tonnes and using trucks with an average capacity of 25 tonnes). The actual number depends on the size of the trucks used and other variables, as shown in Table 4 .

Concerns were also raised about dust generated by truck movements.

The WRC suggested that truck movements should be monitored periodically to determine whether further road restrictions may be required. The Council has agreed to conduct monitoring.

Assessment

The area considered for assessment of this factor is related to truck movements along Ocean Beach Road and beyond as trucks disperse to farms north, west and east of the quarry.

The EPA's environmental objective for this factor is: to ensure that an adequate level of service, safety and public amenity is maintained.

The southern section of the road carries significant numbers of children on foot in season as people walk to and from the inlet and beaches. This situation is not ideal but there appears to be no feasible alternative. Any re-routing of the access road to the quarry to minimise the degree of contact with traffic and pedestrians would result in other unacceptable environmental impacts and is likely to be prohibitively expensive. Similarly, widening of the southern portion of Ocean Beach Road would pose problems where the road is squeezed between the inlet and the cliffs (in which it is understood the Katelysia Rock Shelter is located-see Section 3.6).

With respect to dust from truck movements all loads are required to be covered and this is expected to minimise the amount of dust created by the passage of the vehicles.

Actions which should reduce the likely undesirable effects of the continued use of the road by quarry trucks include traffic-calming speed humps and 30km/h speed limit at the southern end of Ocean Beach Road, the time restrictions on truck movements, the 60km/h limit along the entire remainder of Ocean Beach Road and the Council's commitment (in its response to submissions) to carry out monitoring of trucks to determine whether further restrictions may be required.

The six month lime spreading season used as a basis for calculations in the CER is considered by the EPA to be longer than the typical lime-spreading season. It appears that 130-140 days (mid November to March) is the case in recent years. However, calculations for three different lengths of carting season (90 days, 135 days and 180 days) have been used in Table 4 to show how this variable affects numbers of truck movements on a daily and hourly basis.

Table 4. Factors affecting numbers of truck movements. (two movements=one round trip)

Tonnes per year	*Length of lime-spreading season (days)*	*Truck size (tonnes)*	*Average truck movements /day*	*Average truck movements /hour*
10,000	180	42.5	2.6	0.3
^	^	30	3.7	0.4
^	^	20	5.5	0.6
^	^	10	11.1	1.1
	135	42.5	3.5	0.4
^	^	30	4.9	0.5
^	^	20	7.4	0.7
^	^	10	14.9	1.5
	90	42.5	5.3	0.5
^	^	30	7.4	0.7
^	^	20	11.1	1.1
^	^	10	22.2	2.2
15,000	180	42.5	3.9	0.4
^	^	30	5.5	0.6
^	^	20	8.3	0.8
^	^	10	16.6	1.7
	135	42.5	5.3	0.5
^	^	30	7.4	0.7
^	^	20	11.0	1.1
^	^	10	22.2	2.2
	90	42.5	7.8	0.8
^	^	30	11.1	1.1
^	^	20	16.7	1.7
^	^	10	33.4	3.3

The EPA has considered the consequences of transporting larger amounts of limesand from the quarry (see Table 4). As truck numbers are related to the amount of lime sold and transported the EPA considers that there should be an upper limit of 15,000 tonnes per year imposed. At this level there is room for a certain amount of expansion over amounts sold compared to the past few years but the amount of truck movements on average would not be excessive (see Table 4). Under the maximum recommended production scenario with sales of 15,000tpy, on average approximately 5 to 23 truck movements a day (for 42.5t and 10t trucks, respectively) could be expected, or up to 2.3 movements an hour on average for a 10 hour day.

The EPA considers that the level of truck movement is acceptable provided that the other restrictions on vehicle speed and avoidance of school bus times and public holidays are closely observed.

Summary

Having particular regard to:

(a) the 30km/h limit and traffic calming devices in place near the southern end of the road;

(b) the blanket speed limit of 60km/h along Ocean Beach Road;

(c) restrictions on truck movements on certain days and at specific times;

(d) the relatively low average daily truck numbers;

(e) Council's commitment to traffic monitoring; and

(f) the EPA's proposed condition on an upper limit of 15,000t/a limesand for transport from the quarry;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for road transport.

3.6 Aboriginal culture and heritage

Description

Clearing of the site for quarrying is likely to destroy potential sites within the proposed quarry. None is known from within the area and, it is thought that, given the dense vegetation, lack of overhanging shelter and water it is unlikely that sites, if they exist, would have been frequently used. However, no survey of the site has been carried out yet. The Katelysia Rock Shelter was mentioned but is understood to be located some distance to the north of the proposed mining lease.

Submissions

The Department of Aboriginal Affairs commented that it could not make an effective submission until the completion of a survey for sites. Correspondence from the Aboriginal Affairs Department to the Shire in March 1998 noted that because of the dense vegetation in the area a surface survey would be unlikely to find sites. It recommended that consultation takes place between the Shire and the Aboriginal community concerned with the area and that in addition the area should be monitored during ground disturbing studies (eg clearing and initial quarrying) so that Aboriginal sites, especially burial sites which may exist, are not

affected. The Department recommended that these considerations should be a part of the environmental management plan for the site.

The proponent committed to carrying out a survey of the proposed area and to abiding by the provisions of the Aboriginal Heritage Act.

Assessment

The area considered for assessment of this factor is the 12ha proposed for quarrying.

The EPA's environmental objective for this factor is to ensure that the proposal complies with the objectives of the *Aboriginal Heritage Act 1972* and to ensure that changes to the biological and physical environment resulting from the project do not adversely affect cultural associations with the area.

The Aboriginal Affairs Department in Albany has more recently reiterated to the DEP the need for a survey of the site to be completed but has suggested that, if the proponent prefers, the survey could be done in stages immediately prior to the phased clearing of portions of the site for quarrying. This acknowledges that the area is thickly vegetated and that recognition of significant Aboriginal sites could be difficult under these circumstances.

The Shire has recently advised that it has been in contact with the Albany branch of the Aboriginal Affairs Department (AAD)-see letter from Shire dated 28.5.99 in Appendix 5. It is proposed to convene a meeting between the Shire and the AAD to determine the extent of a survey for sites.

Summary

Having particular regard to the proponent's commitments:

(a) the advice of the AAD regarding the acceptability of staging surveys prior to phased clearing;

(b) the proponent's commitments:

- to meet with the Aboriginal Affairs Department to determine the extent of a sites survey;
- to abide by the requirements of the Aboriginal Heritage Act;
- to carry out a survey for sites prior to clearing; and

(c) the EPA's recommended condition for the preparation of a management plan for the protection of aboriginal sites;

it is the EPA's opinion that the proposal is capable of being managed to meet the EPA's environmental objective for aboriginal culture and heritage.

3.7 Public health and safety

Description

This factor relates to aspects of the former quarry and mining of the proposed site, and the operation of associated machinery and trucks within the lease area.

The steep faces of the former pit are the chief cause of concern because they are not closed off to the public, nor are there signs warning of the danger of falling in. The CER states that the

steep walls will be rendered safe to the requirements of the Department of Minerals and Energy. Access to the tops of the walls will be prevented by installing secure fencing to DME requirements. Vehicular entry to the quarry outside of operating hours is currently prevented by closing and locking the boom gate near the start of the dedicated quarry access road. This access road would also be used for the proposed quarry.

The quarry would be developed from the outset to DME requirements for safe mining. It would be shallower than the former pit and the walls would be laid back to a gentler angle to create less of a personal hazard and to enable easier rehabilitation. Dust is generated within the quarry during the course of operations but a site inspection confirmed that this is not causing significant impacts to the surrounding vegetation. Other aspects of operating a mine, such as the requirements for safe operation of machinery, would be prescribed by the DME. The DEP would work cooperatively with the DME to ensure that mining and environmental outcomes are optimised.

Submissions

In response to the proponent's commitment to fencing off the former quarry the DME stated that while safety appears to be satisfactorily addressed it would nevertheless be the responsibility of the Shire as proponent to maintain any fencing erected for this purpose. The proponent accepts this requirement.

Assessment

The area considered for assessment of this factor is the area of the former and proposed quarries and the dedicated access road.

The EPA's environmental objective for this factor is to ensure that the safety of the public is not compromised. This can be achieved by appropriate safety fencing around the former quarry and warning signs where entry is possible via the access road. The option of cutting back the walls of the pit to create a gentler slope has been considered but rejected. It would cause unacceptable impacts from the loss of currently intact vegetation surrounding the pit, and from the high degree of extra visual disturbance along the southern margin of the pit which would be seen from many areas to the north. The proponent intends to retain the existing sand bund along the top of the northern wall of the quarry, on which some vegetation has become established.

The proponent committed to preparing a Rehabilitation Plan for the long term future of the old quarry, with community consultation and EPA approval. The Plan would have to address the safety of any proposals for the subsequent usage of the area. The EPA requested that this Plan be prepared and submitted for this assessment of the proposed extension to the quarry. The Shire commissioned the Denmark Environment Centre to prepare the Rehabilitation Plan for the former quarry.

A draft of this Plan was submitted for comment to the DEP. The DEP suggested some minor modifications, and the revised Plan was subsequently passed by Council and is considered to be acceptable by the EPA. The EPA considers this revised Plan is an appropriate strategy for the satisfactory management of safety issues (and rehabilitation) associated with the former pit. The Plan also commits to addressing the issue of what the final land use of the former quarry might be, with full community consultation, within six months of approval of the proposal. This must take into account any ongoing DME safety requirements.

Summary

Having particular regard to:

(a) the proponent's commitments to address safety requirements, (plus full rehabilitation) and subsequent performance monitoring of this work in the former pit, to the requirements of the EPA and the DME;

(b) the requirement to observe good mining practices in the operation of the proposed quarry, to the requirements of the DME; and

(c) the involvement of staff of the DME in setting standards and ensuring that these are met;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for public health and safety.

4. Conditions and commitments

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

In developing recommended conditions for each project, the EPA's preferred course of action is to have the proponent provide an array of commitments to ameliorate the impacts of the proposal on the environment. The commitments are considered by the EPA as part of its assessment of the proposal and, following discussion with the proponent, the EPA may seek additional commitments.

The EPA recognises that not all of the commitments are written in a form which makes them readily enforceable, but they do provide a clear statement of the action to be taken as part of the proponent's responsibility for, and commitment to, continuous improvement in environmental performance. The commitments, modified if necessary to ensure they are enforceable, then form part of the conditions to which the proposal should be subject if it is to be implemented.

The EPA may, of course, also recommend conditions additional to those relating to the proponent's commitments.

4.1 Proponent's commitments

The proponent's commitments as set out in the CER and subsequently clarified and expanded, as shown below in Table 5 and included in Appendix 1 should be made enforceable conditions.

4.2 Recommended conditions

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the proposal by the Shire of Denmark to quarry limesand is approved for implementation. These conditions are presented in Appendix 1. Matters addressed in the conditions include:

(a) that the proponent be required to fulfill the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 1;

(b) a maximum quarrying rate of 15,000 tonnes per year;

Table 5. Summary of proponent's commitments

The Shire of Denmark commits to the following:

Issue	*Objective*	*Commitment*	*Timing*	*Whose advice*
Rehabilitation of the former quarry	Reduce visual impacts and assist in stabilising the slope	(1) The top of the pit walls and its surrounding lip will be revegetated with appropriate endemic species, and brushed. (2) Screening vegetation will be introduced on the northern lip of the former quarry to progressively screen any exposed section of the southern wall. (3) Benches will be constructed, seeded and brushed in areas where increased wall stability is possible and required. (4) Placement of seedlings into eroded pockets of the wall (depending on accessibility) will occur. (5) Parts of the top of the N, E and S walls that are below a critical slope (approx. 60^0) will be planted with cuttings of *Pelargonium capitatum*.	Within three months of the Minister granting environmental approval	EPA and DME
	Ensure the long term safety of the site	(6) The quarry walls and surrounds will be made safe with appropriate fencing and signage.	Within three months of the Minister granting approval	DME
	Create a plan for an appropriate end use	(7) All possible uses will be examined and the community consulted.	Within 6 months of approval	EPA and DME
Monitoring of works in the former quarry	Ensure the long term safety of the site	(8) The safety fence will be maintained in a condition which effectively excludes unauthorised public access to the site and monitoring results will be recorded in the Mine Record Book.	Monthly following fence construction	DME
	Ensure the long term success of the rehabilitation of the site	(9) The success of revegetation efforts will be monitored.	Every six months for two years, then annually	DEP, CALM and DME
		(10) The Shire will collect seed from the adjacent reserve for use in rehabilitation.	For the duration of rehabilitation works and monitoring	Shire Nursery-man

Issue	*Objective*	*Commitment*	*Timing*	*Whose advice*
Monitoring of works in the former quarry	Ensure the long term success of the rehab-ilitation of the site	(11) Submission of rehabilitation progress monitoring reports.	Annually	EPA and DME
	To restrict the presence and spread of weeds	(12) Any weeds identified on site will be removed by hand.	Six monthly	DEP and DME
		(13) Materials required for rehabilitation of the site will preferentially be sourced from within the site boundary. Materials needing to be imported will first be checked to ensure they are weed-free.	Over the course of rehabilitation works and monitoring	DEP and DME
Impacts on flora and fauna	Protect rare species; minimise the impact on all species	(14) Site will be rehabilitated to native vegetation. Weeds will be controlled by removal.	As soon as areas become available	EPA and DME
Landform restoration	Restore the site to a landform compatible with the surroundings	(15) The quarry will not be excavated as deeply as previously. The land will be re-contoured after mining and revegetated with appropriate native species of vegetation.	Progressively during the life of the quarry	EPA and DME
Impacts on groundwater	Protect groundwater quality and levels	(16) Contaminated soil arising from fuel and oil spills will be removed and disposed of appropriately.	Throughout the life of the quarry	DEP
Noise, and dust from truck movements	Reduce the impacts to acceptable levels	(17) Truck movements will be restricted to outside the times when school buses are on the road ie not permitted between 8am to 9am and 3pm to 4pm on school days, and never at night. Road trains are not allowed on public holidays. Vehicles engaged in the transport of lime will be monitored for frequency of movements, adherence to proposed speed restrictions on Ocean Beach Rd., and compliance with curfews on times of movements.	Throughout the life of the quarry	DEP
Visibility of the quarry	Reduce the visibility from areas to the north	(18) The quarry will be shallower than the existing pit so there will be no exposed walls visible from areas to the north of the quarry. Walls will be screened by a bund growing appropriate endemic vegetation.	Prior to clearing and quarrying, and progressively during the life of the quarry	DEP
Heritage values	Protect significant Aboriginal sites	(19) A heritage survey will be carried out and the provisions of the Aboriginal Heritage Act will be followed.	Prior to clearing	DEP and AAD
Rehabilitation of the site	Restore the site to native vegetation	(20) Develop a detailed rehabilitation plan.	Immediately after approval, with regular reviews	DEP, DME

(c) preparation by the proponent of an Environmental Management Plan which addresses, but is not limited to:

- a schedule of progressive works to be carried out;
- a rehabilitation plan which is used as the basis for mine planning and progressive rehabilitation;
- re-contouring schedules and diagrams;
- management of topsoil:-location, schedules for its removal and replacement;
- proposals to improve visual amenity;
- type and frequency of monitoring and proposed completion criteria for the proposed work above;
- parks and recreation reserve management to protect the values of the reserve surrounding the proposed quarry;

(d) preparation by the proponent of a Decommissioning Management Plan;

(e) the requirement for Rehabilitation Performance Reviews which are to be undertaken annually for the first five years and subsequently every three years;

(f) the requirement for an Aboriginal Sites Survey.

5. Other Advice

The EPA offers comment here that is additional to advice on relevant environmental factors and refers to responsibilities which are not those of the proponent.

5.1 Supply and demand of limesand

To reduce the potential for soil acidification which occurs under current farming practices, Agriculture Western Australia (AgWA), through its "Time to Lime" policy, is encouraging farmers to increase the amounts of lime they spread on farm soils (Fisher et al. 1999).

Realising that demand for limesand is likely to increase consequent to this campaign the EPA sought advice from the DME on its assessment of the probability of likely alternate sources of limesand in the region of Denmark. In response to the EPA's request a brief report was compiled by the DME (Freeman, 1999), the main points of which are:

- limesands are commonly formed from the breakdown of seashells by waves on beaches. The sands are then blown inland and form dunes. These dunes can become cemented through solution and precipitation of the lime within the sand. Quartz sand is also usually present in the limesands and the proportion of lime to quartz is a critical factor in assessing the quality of the lime;
- the region has been mapped (by the Geological Survey) to identify the units which contain lime. The data, at a scale of 1:250,000, is too generalised to define sites that contain economic occurrences and can only be used as a key to the favourable geological units where limesand deposits occur. Potentially economic accumulations occur in a narrow strip extending inland from the coast for a distance of 1-3 kilometres. Within this zone lime quality is highly variable. The acquisition of site-specific sampling information is a necessary next step, either by backhoe sampling or drill sampling;

- the Shire of Denmark commissioned a survey (Masters, 1993) to identify a potential source of at least 1 million cubic metres of first grade agricultural lime. "First grade" is defined as having an acid neutralising value of at least 75%, with more than 80% passing through a 600 micron mesh. The survey consisted of enquiries to 36 properties (only eight owners gave permission for access to explore) and led to the drilling of 18 holes in five areas, including the Ocean Beach site, the subject of this current proposal and assessment. This culminated in a subsequent detailed reserves drilling programme at the Ocean Beach site to outline a measured resource of 743,500m^3 averaging 76.2% calcium carbonate (some of which is cemented and therefore not free-flowing limesands) or 257,800m^3 averaging 78.4% $CaCO_3$ which is considered to be free-flowing sand.
- a statement made in Masters' report, and endorsed by the DME, was that "there may be no substitute for a comprehensive drilling programme into virtually every potentially lime-bearing dune within the study area." (Clearly this level of information on the extensive mapped areas potentially containing limesands has not begun to be approached). The main conclusion from the Masters' report was that the only potential site (of those assessed) was at Ocean Beach. This appears to conflict with the earlier statement. A key to this might be in the limited access for exploratory work granted by landowners;
- it is possible that if the target size of the limesands resource had been smaller or lower grade, the choice may not have been restricted to only the Ocean Beach Quarry. However, the DME believes that the effect of exploiting a smaller or lower grade target would be to increase the capital or operating costs, resulting in higher costs for the product;
- the survey also indicated that the search could have been extended to the east or west along the coastline but that tenure of those areas is national park. There is little to be gained therefore from extending the boundaries of the area investigated.

5.2 Soil acidification and the importance of lime

Returning to the issue of soil acidification, AgWA has prepared a number of Farmnotes and Research and Development Updates (listed in Bibliography) on the topic of soil acidity. These have been used to prepare the following information.

Soil acidification has the potential to affect more currently productive land in WA than even encroaching groundwater salinity by decreasing the productivity of agricultural soils and causing reduced crop yields. This in turn would result in increased water infiltration through the soil profile, raising water tables and exacerbating salinity problems. As the soil becomes more acid, some nutrients such as phosphorus and molybdenum become less available and essentially deficient. Conversely, aluminium contained within the soil becomes more available and can increase to levels toxic to plants. Soil balance is important: too much lime can induce trace element deficiencies.

Many light textured soils in the State's cropping areas were slightly acid even before they were cleared, but with the introduction of agriculture their acidity is increasing. The main causes are: (a) the removal of alkaline produce (grain, seed, feedstock for grazing); (b) leaching of nitrate out of the root zone; and (c) application of acidifying fertilisers.

Removing produce from the paddock can be thought of as equivalent to removing lime, leaving the soil more acid. Nitrogen-fixing legume plants take up more cations than anions and consequently produce acid. The amount of acidity produced by the plant is equivalent to the

content of excess cations or ash alkalinity of the plant. Leaching of nitrogen will cause acidification, irrespective of whether the nitrogen came from growing legumes or was applied as fertiliser. Fertilisers which increase the growth of legumes, for example superphosphate, will increase the rate of acidification of the soil. Nitrate levels are high at the break of the season when rains begin. At this time plants are not usually growing quickly, resulting in drainage which flushes nitrate away with it.

Lime to mitigate these affects can be spread at any time of the year, but must be well mixed with the soil before it neutralises it. Situations where it may be subject to wind erosion should be avoided.

To satisfy the demand for more lime, pressure to produce more is being applied to existing resources such as the Ocean Beach Quarry, which has in the last year catered to the needs not only of farmers in the Shire of Denmark but to areas up to 150km west, north and east. It points to the need for a lime strategy to better plan for future supplies (at least in the short to medium term) and suggests that future farming practices, in order to become sustainable, need to change, so as to no longer rely on imports of lime.

Submissions

Some submitters are concerned that the life of the quarry will be significantly shortened if limesand supplies are made available to all potential buyers, particularly if they are located outside of the immediate district, and especially if AgWA's drive to increase the amount of lime applied to pastures is successful. This would be a loss to the farmers of the Shire because there are at this stage no other high grade limesand resources known in the Shire. A decision had been taken in 1996 by the Shire to limit sales to users in the Wilson Inlet Catchment, the Walpole Ward of the Shire of Manjimup and the Shire of Denmark but it was effectively rescinded in 1998. Production in the last couple of years has significantly exceeded the nominal 10,000 tonne limit and there are particular concerns that this finite resource may be used for purposes other than amelioration of soil acidity; for example, as a stockfeed supplement. In 1996-7 the total amount of limesand sold was estimated to be 14,000 tonnes and in 1997-8 around 13,000t. If the "Time to Lime" policy gains greater commitment from farmers (AgWA believes that 20,000t should be applied annually within the Shire of Denmark alone) the quarry's life would be considerably shorter than the planned 40 years.

The Shire in its response to these issues stated that it has set a limit of 10,000 t/a which could be adjusted upward at its discretion to 20,000 t/a and that it had determined not to restrict the distribution area. While the matter of distribution is not strictly a part of the scope of the EPA's environmental assessment, the EPA believes it has a role to consider the supply of limesand and the need for it, and to provide advice accordingly.

Submissions refute the claim in the CER that the 1993 study by Masters indicated there are no alternative sources, apart from others in the same coastal environment with the same environmental concerns, citing the limited nature of that study. Some submitters believe that agencies such as AgWA and the DME should carry out surveys on already cleared farmland to locate alternate sources for the South Coast. They do not support sourcing of limesand from reserves and remnant native vegetation and believe this should be phased out. In response the Shire said it would consider closing down the Ocean Beach Quarry if there were a suitable alternative.

Advice

Pressures on the environment of the South Coast from the extraction of limesand will continue to grow if current landuse practices which require ongoing, and in many cases, increased applications of lime, continue. Lime-spreading reduces acid buildup in the soil profile for 1-10 years depending on several variables.

This is an unsustainable practice in the longer term. More appropriate, sustainable farming practices, which do not rely on the importation of increasing amounts of products such as fertilisers and lime to maintain production and soil balance, need to continue to be developed and implemented by farmers and AgWA.

In the interim the EPA notes that Government has taken steps to initiate the development of a draft State Lime Supply Strategy. A steering committee comprising DRD (the coordinator of the study), DEP, CALM and DME has been set up to manage the process and to liaise with other involved agencies. Amongst its terms of reference (DRD 1998) are to:

- "prepare and cost a study programme which defines proven, known and inferred resources of calcium carbonate ..within the State's land and near shore marine areas";
- "identify strategic resources offering distinct economic potential for the State, taking into account economic, social, environmental and other relevant issues"; and
- "define long term accessibility of strategic resources from environmental, heritage and planning perspectives...and where possible develop a programme for timely extraction."

The scope of this work is broad and includes supplies of lime for industrial purposes.

The EPA considers there should be efforts to reduce the current reliance on a single source of limesand, occurring in an environmentally sensitive coastal area within a conservation reserve, so that it can ultimately be phased out.

The EPA considers that quarrying operations ought not to occur in areas reserved for conservation, parklands and recreation, preferring to see them established in less environmentally sensitive environments and where there is no conflict in the vested purpose of the land. However, it sees little benefit in closing the Ocean Beach Quarry in the short term if that closure leads to the establishment of one or more new quarries in a similar, sensitive, coastal setting. The EPA believes that the current operation should be allowed to extend west into the proposed area under strict conditions which include a maximum annual limit of 15,000 tonnes limesand production (Section 3.4). This level has been imposed to allow for a limited increase over recent production tonnages but recognises that the number of trucks carrying limesand needs to be regulated on Ocean Beach Road for reasons of public safety and amenity.

A further reason for capping production is to ensure that the quarry life is not unduly shortened by large production increases. The EPA believes that ideally the quarry should be phased out over a period of years, during which time other commercial limesand deposits can be delineated to eventually take over from the Ocean Beach Quarry. This period will also facilitate rehabilitation of the former quarry, with funding from royalties from past and proposed limesand sales. Given the lack of adequate information regarding alternative sources of limesand the EPA commends the proposal by Government to develop a State Lime Supply Strategy for the orderly supply of limestone or limesand to address agricultural needs and to protect vegetation and ecosystems in coastal dunes on public land.

Whilst the strategy to find more deposits may seem to contradict the EPA's comment about the unsustainability of current farming practices (with their requirements for lime in the longer

term) the EPA recognises that (a) a programme to delineate new lime reserves may take time to take effect, perhaps in part due to lack of access to prospective privately owned lands; and (b) any changes to broadacre farming practices are likely to require a considerable period of time to develop and implement alternatives which do not depend on applications of lime.

6. Conclusions

The EPA has considered the proposal by the Shire of Denmark to mine limesand and concluded that it can be managed to meet the EPA's environmental objectives, provided that the conditions summarised in Section 4 and set out in detail in Appendix 1, are imposed.

The EPA considers that the key environmental factors associated with this proposal are landform and visual amenity, vegetation communities with respect to rehabilitation and road transport issues. The supply of and the demand for limesand is also a key issue for strategic consideration at State level.

Loss of vegetation communities in an A class reserve; groundwater and soil contamination; and public health and safety; were also considered to be relevant environmental factors, but of lesser importance in this particular proposal. For broader consideration by farmers and government is the supply and demand of limesand.

Because of the sensitive location of the quarry site, successful rehabilitation is particularly important. The EPA has therefore recommended a condition requiring an annual performance review of rehabilitation for the first five years. If rehabilitation is found to be inadequate the EPA considers that approval to continue quarrying should be revoked.

The issue of demand for limesand is being predominantly driven by current farming practices which require soils under crops (which have a tendency to become increasingly acid) to be neutralised by the application of lime. With acid soils having the potential to compromise two thirds of the State's agricultural areas if left untreated the problem of acid soils is potentially even bigger than salinisation in relation to agricultural production (Porter and Miller, 1998; Fisher, Diggle and Bowden, 1999). The EPA supports the development of a State Lime Supply Strategy for the orderly supply of limestone or limesand to address agricultural needs, and the development by farmers and AgWA of more sustainable farming practices which do not rely on the importation and application of lime.

7. Recommendations

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes that the project being assessed is for an expansion of a quarry for limesand in A Class Reserve 24913 vested in the Shire of Denmark for the purpose of parkland and recreation.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3;
3. That the Minister notes that the recommended conditions include a constraint on the annual amount of limesand quarried to a rate not exceeding 15,000 tonnes per annum.

4. That the Minister notes that the EPA has been concerned about rehabilitation work undertaken to date, and has included in the environmental conditions a requirement for an annual review of rehabilitation performance for the first five years, and thereafter every three years and the need for the rehabilitation to be satisfactory.

5. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 1, including the proponent's commitments.

6. That the Minister imposes the conditions and procedures recommended in Appendix 1 of this report.

Appendix 1

Recommended Environmental Conditions and proponent's consolidated commitments

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
(PURSUANT TO THE PROVISIONS OF THE
ENVIRONMENTAL PROTECTION ACT 1986)

CONTINUATION OF LIMESAND MINING, OCEAN BEACH QUARRY.
PORTION OF RESERVE A24913, OCEAN BEACH ROAD, DENMARK

Proposal: The mining of limesands within an extension to the existing quarry, situated in A Class reserve 24913 reserved for the purpose of parkland and recreation and vested in the Shire of Denmark. Rehabilitation of both the worked-out areas of the existing quarry and new areas following future quarrying will also be carried out. Mining is by front end loader and, where necessary, a bulldozer with a ripper. The product is passed through a mobile sieve/crusher unit for a rate of production of up to 15,000 tonnes per year. The proposal is documented in schedule 1 of this statement.

Proponent: Shire of Denmark

Proponent Address: Strickland Street, Denmark WA 6333

Assessment Number: 1049

Report of the Environmental Protection Authority: *Bulletin 941*

The proposal to which the above report of the Environmental Protection Authority relates may be implemented subject to the following conditions and procedures:

1 Implementation

1-1 Subject to these conditions and procedures, the proponent shall implement the proposal as documented in Schedule 1 of this statement.

1-2 Where the proponent seeks to change any aspect of the proposal as documented in Schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.

1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

2 *Proponent Commitments*

2-1 The proponent shall implement the consolidated environmental management commitments documented in Schedule 2 of this statement.

2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of the fulfilment of conditions and procedures in this statement.

3 *Rate of Mining*

3-1 The rate of limesand mining shall not exceed 15,000 tonnes per annum.

4 *Environmental Management Plan*

4-1 In order to manage the environmental impacts of the project, and to fulfil the requirements of the conditions and procedures in this statement, prior to ground-disturbing activity, the proponent shall demonstrate to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection, the Department of Conservation and Land Management and the Department of Minerals and Energy that there is in place an Environmental Management Plan which includes the following elements:

(1) Rehabilitation management to address the rehabilitation of various areas of the quarry as they are scheduled for mining, and which contains:

- a schedule of the work to be carried out progressively, including location maps for the various elements of the Plan;
- a rehabilitation management plan which is used as the basis for mine planning and progressive rehabilitation;
- re-contouring schedules and diagrams;
- topsoil management - its location, schedules for stockpiling and timely redistribution to ensure seed viability;
- strategies to improve visual amenity;
- species of native vegetation to be used in replanting and supplementary seeding;
- weed and rabbit controls to be imposed;
- type and frequency of monitoring for the rehabilitation;
- completion criteria for the rehabilitation; and
- a process for review of the Environmental Management Plan.

(2) Parks and Recreation Reserve management to protect the environmental values of the surrounding Parks and Recreation Reserve from quarry impacts, including:

- methods to control human and vehicular access from the quarry areas to environmentally sensitive portions of the Parks and Recreation Reserve; and

- minimisation of the impacts of quarrying activities on native fauna in the adjacent reserve.

4-2 The proponent shall implement the Environmental Management Plan referred to in condition 4-1.

4-3 The proponent shall make the Environmental Management Plan referred to in condition 4-1 publicly available, to the requirements of the Environmental Protection Authority.

5 Rehabilitation Performance Review

5-1 Within 12 months following the commencement of quarrying then annually for five years and every three years thereafter, the proponent shall prepare Rehabilitation Performance Reviews:

- to document the outcomes, beneficial or otherwise;
- to review the success of goals, objectives and targets;
- to evaluate rehabilitation performance over the preceding interval; and
- to outline corrective actions required, if any;

relevant to the following:

1. rehabilitation objectives reported on in Environmental Protection Authority Bulletin 941;
2. the agreed Environmental Management Plan;
3. proponent's consolidated environmental management commitments documented in Schedule 2 of this statement and any subsequent commitments arising from the fulfilment of conditions and procedures in this statement; and
4. environmental performance indicators;

to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

Note: Continuation of mining will depend upon satisfactory rehabilitation work in the proposed and former quarry areas over the previous twelve month period. The Environmental Protection Authority may recommend changes and actions (including shutdown of the quarry) to the Minister for the Environment following consideration of each Rehabilitation Performance Review.

5-2 The proponent shall implement corrective actions required as a result of the annual review (see Commitment 11).

6 *Aboriginal Sites*

6-1 Prior to commencement of quarrying, the proponent shall prepare an Aboriginal Sites Management Plan to the requirements of the Environmental Protection Authority on advice of the Aboriginal Affairs Department and the Department of Environmental Protection.

6-2 The proponent shall implement the Aboriginal Sites Management Plan required by condition 6-1.

7 *Decommissioning Plan*

7-1 At least six months prior to decommissioning, the proponent shall prepare a Decommissioning Plan to ensure that operational parts of the quarry, associated infrastructure and surrounding areas are rehabilitated, to the requirements of the Environmental Protection Authority on advice of the Department of Minerals and Energy and the Department of Environmental Protection.

This Plan shall address:

- removal or, if appropriate, retention of plant and infrastructure;
- final rehabilitation of all disturbed areas to a standard suitable for agreed new land uses consistent with the Environmental Management Plan required by condition 4-1; and
- identification and remediation of any contaminated areas, including provision of evidence of notification to relevant statutory authorities.

7-2 The proponent shall implement the Decommissioning Plan required by condition 7-1.

7-3 The proponent shall make the Decommissioning Plan required by condition 7-1 publicly available, to the requirements of the Environmental Protection Authority.

8 *Proponent*

8-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the Environmental Protection Act 1986 is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person in respect of the proposal.

8-2 Any request for the exercise of that power of the Minister referred to in condition 8-1 shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the proposal in accordance with the conditions and procedures set out in the statement.

8-3 The proponent shall notify the Department of Environmental Protection of any change of proponent contact name and address within 30 days of such change.

9 Commencement

9-1 The proponent shall provide evidence to the Minister for the Environment within five years of the date of this statement that the proposal has been substantially commenced.

9-2 Where the proposal has not been substantially commenced within five years of the date of this statement, the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment will determine any question as to whether the proposal has been substantially commenced.

9-3 The proponent shall make application to the Minister for the Environment for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement at least six months prior to the expiration of the five year period referred to in conditions 9-1 and 9-2.

9-4 Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years for the substantial commencement of the proposal.

10 Compliance Auditing

10-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit program prepared in consultation between the proponent and the Department of Environmental Protection.

10-2 Unless otherwise specified, the Chief Executive Officer of the Department of Environmental Protection is responsible for assessing compliance with the conditions, procedures and commitments contained in this statement and for issuing formal, written advice that the requirements have been met.

10-3 Where compliance with any condition, procedure or commitment is in dispute, the matter will be determined by the Minister for the Environment.

Schedule 1

The Proposal

The proposal seeks to extend the current Ocean Beach limesands quarry operation to the west as well as to carry out rehabilitation of the worked-out areas of the existing quarry. Most of the proposed quarry area will occupy a slight hollow immediately to the north of a fixed sand dune, located in A class reserve 24913. The proposal will require the clearing of a further 12ha of the reserve. The pit depth will be about 5 metres. The first grade resource (average 78.4% calcium carbonate) is calculated at 257,800 cubic metres or 400,000 tonnes and at the proposed annual mining rate of 10,000 tonnes would have a life of about 40 years.

A front end loader will be used for the mining and loading. A bulldozer with a ripper attachment may be used to break up more cemented blocks. An excavator and truck may also be used within the quarry. The product is passed through a sieve/crusher before being stockpiled for sale and subsequent road transport to farms. Truck sizes to transport the product vary from less than 10t up to semi trailers carrying over 40 tonnes. At the quarrying rate of up to 15,000 tonnes per year and during the liming season from approximately November to mid-March, on average, between five and 23 truck movements per day are expected. Loading and transportation of the product will take place during the times shown in Table 1 below.

Site infrastructure will consist of an overhead power line to run the sieve and conveyor belt, dirt access road, loading ramp,. open-sided storage shed and a fuel storage tank. Refuelling of earth moving machinery would be on site from a tanker truck which visits when necessary.

Table 1. Key proposal characteristics - includes modifications and clarifications made during the environmental impact assessment

Characteristic	*Description*
Land tenure	Mining Lease application for excision from A Class reserve 24913 for parklands and recreation
Area	12ha.
Area of disturbance	up to 12ha.
Quarry depth / resource reserve	approximately 5m / 257,800m^3 of lime averaging 78.4% $CaCO_3$
Rate of clearing	up to 0.45ha/year, based on 15,000tpy production
Production rate	Ave.10,000t/a, 15,000t/a max.
Life of quarry	up to 40 years (at 10,000t/a)
Method of mining	front end loader, dozer with ripper as necessary
Processing	mobile sieve / crusher
Infrastructure	existing overhead power supply for crusher; gravel access road
Transport of product	by truck (sizes vary from <10t to >42.5t)
Frequency and timing of truck (carrying 42.5t and 10t resp.) movements for 15,000tpy	between approx. 5 and 23 daily during liming season (Nov. to March), up to 7 days a week, except between 8am to 9am and 3pm to 4pm on school days. Road trains are not permitted on public holidays
Workforce	1-2

Abbreviations: *ha=hectares; m^3=cubic metres; CaCO3=calcium carbonate; tpy=tonnes per year; t=tonnnes*

Schedule 2

Proponent's Consolidated Environmental Management Commitments

6 June 1999

LIME SANDS MINING, OCEAN BEACH QUARRY, PORTION OF RESERVE A24913, DENMARK

SHIRE OF DENMARK

Schedule 2: **Summary of Proponent's commitments**

The Shire of Denmark commits to the following:

Issue	*Objective*	*Commitment*	*Timing*	*Whose advice*
Rehabilitation of the former quarry	Reduce visual impacts and assist in stabilising the slope	(1) The top of the pit walls and its surrounding lip will be revegetated with appropriate endemic species, and brushed. (2) Screening vegetation will be introduced on the northern lip of the former quarry to progressively screen any exposed section of the southern wall. (3) Benches will be constructed, seeded and brushed in areas where increased wall stability is possible and required. (4) Placement of seedlings into eroded pockets of the wall (depending on accessibility) will occur. (5) Parts of the top of the N, E and S walls that are below a critical slope (approx. 60^0) will be planted with cuttings of *Pelargonium capitatum*.	Within three months of the Minister granting environmental approval	EPA and DME
	Ensure the long term safety of the site	(6) The quarry walls and surrounds will be made safe with appropriate fencing and signage.	Within three months of the Minister granting approval	DME
	Create a plan for an appropriate end use	(7) All possible uses will be examined and the community consulted.	Within 6 months of approval	EPA and DME
Monitoring of works in the former quarry	Ensure the long term safety of the site	(8) The safety fence will be maintained in a condition which effectively excludes unauthorised public access to the site and monitoring results will be recorded in the Mine Record Book.	Monthly following fence construction	DME
	Ensure the long term success of the rehabilitation of the site	(9) The success of revegetation efforts will be monitored.	Every six months for two years, then annually	DEP, CALM and DME
		(10) The Shire will collect seed from the adjacent reserve for use in rehabilitation.	For the duration of rehabilitation works and monitoring	Shire Nursery-man

Issue	*Objective*	*Commitment*	*Timing*	*Whose advice*
Monitoring of works in the former quarry	Ensure the long term success of the rehab-ilitation of the site	(11) Submission of rehabilitation progress monitoring reports.	Annually	EPA and DME
	To restrict the presence and spread of weeds	(12) Any weeds identified on site will be removed by hand.	Six monthly	DEP and DME
		(13) Materials required for rehabilitation of the site will preferentially be sourced from within the site boundary. Materials needing to be imported will first be checked to ensure they are weed-free.	Over the course of rehabilitation works and monitoring	DEP and DME
Impacts on flora and fauna	Protect rare species; minimise the impact on all species	(14) Site will be rehabilitated to native vegetation. Weeds will be controlled by removal.	As soon as areas become available	EPA and DME
Landform restoration	Restore the site to a landform compatible with the surroundings	(15) The quarry will not be excavated as deeply as previously. The land will be re-contoured after mining and revegetated with appropriate native species of vegetation.	Progressively during the life of the quarry	EPA and DME
Impacts on groundwater	Protect groundwater quality and levels	(16) Contaminated soil arising from fuel and oil spills will be removed and disposed of appropriately.	Throughout the life of the quarry	DEP
Noise, and dust from truck movements	Reduce the impacts to acceptable levels	(17) Truck movements will be restricted to outside the times when school buses are on the road ie not permitted between 8am to 9am and 3pm to 4pm on school days, and never at night. Road trains are not allowed on public holidays. Vehicles engaged in the transport of lime will be monitored for frequency of movements, adherence to proposed speed restrictions on Ocean Beach Rd., and compliance with curfews on times of movements.	Throughout the life of the quarry	DEP
Visibility of the quarry	Reduce the visibility from areas to the north	(18) The quarry will be shallower than the existing pit so there will be no exposed walls visible from areas to the north of the quarry. Walls will be screened by a bund growing appropriate endemic vegetation.	Prior to clearing and quarrying, and progressively during the life of the quarry	DEP
Heritage values	Protect significant Aboriginal sites	(19) A heritage survey will be carried out and the provisions of the Aboriginal Heritage Act will be followed.	Prior to clearing	DEP and AAD
Rehabilitation of the site	Restore the site to native vegetation	(20) Develop a detailed rehabilitation plan.	Immediately after approval, with regular reviews	DEP, DME

Appendix 2

List of submitters

Organisations:

Aboriginal Affairs Department
Agriculture Department of WA
Conservation Council of WA
Denmark Conservation Society
Denmark Environment Centre
Department of Land Administration
Department of Minerals and Energy
Water and Rivers Commission

Individual:

Appendix 3

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Appendix 4

Priority And Declared Rare Flora possibly present at the site

Department of
CONSERVATION and LAND MANAGEMENT
Southern Forest Region

TO	*Douglas Betts*	***FROM***	*Roger Hearn*
	DEP	***Email***	*rogerh@calm.wa.gov.au*
Phone		***Phone***	*(08) 97 717 936*
Fax		***Fax***	*(08) 97 771 363*
Date	*15/04/99*	***No.pages:***	***1***

OCEAN BEACH QUARRY - DENMARK

Douglas,

My apologies for the delay in responding to your inquiry of 19/3/1999.

Several taxa of Priority Flora should be addressed in the Ocean Beach Quarry area.

Corybas limpidus (DRF) is known from Peppermint shrubland/low woodland not far west (Parry Inlet) of the area and should be considered in any analysis.

Austrofestuca pubinervis, a Priority 1 native grass, has been seen in the Ocean Beach area, but not recently, the exact location of the population not known. It is known from populations growing on the ocean edge of dunes and in typical interdune/limestone and sand based grasslands and heaths. It appears to occupy the role and niche now extensively occupied by the exotic and (in conservation reserves) weed species *Ammophila arenaria* (Marrum grass). In the species list provided for the site it is surprising that *Poa poiformis* and *P.drummondiana* were not found to be present.

Melaleuca ringens is a Priority 2 species currently known from and associated with coastal limestone between Walpole and Windy Harbour. It has not been searched for in the vacinity of Denmark. *Melaleuca.diosmifolia*, a Priority 3 species has a coastal distribution from Windy Harbour to East of Albany (and extending North to the Stirlings), occurring in similar coastal locations but often with exposed granite or shallow sands over granite.

Thomasia quercifolia is a Priority 2 species recorded from Walpole to Albany and growing on coastal limestone. Care needs to be taken in identification of this taxon as it is close in appearance to the common *T.hetrophylla* ms.

Caladenia arrecta ms (Priority 2) is known from consolidated dunes in the William Bay area, and *Caladenia interjacens* ms (Priority 4) from similar habitat is known from further west. Both are possible taxa to be found in this habitat type.

Dryandra sessilis var. *cordata* (Priority 2) is known from similar habitat west of this area in William Bay NP.

Other DRF and Priority taxa associated with the coast are typically not associated with these type of communities.

Roger Hearn

Appendix 5

Shire correspondence with the Aboriginal Affairs Department

COPY

SHIRE OF DENMARK

Strickland Street, Denmark, Western Australia 6333

Tel (08) 9848 1106 Fax (08) 9848 1985

Our Ref: *MON-24913 PD/VLL*
Enquiries: *Pascoe Durtanovich*

28th May 1999

Regional Manager
Dept of Aboriginal Affairs
129 Aberdeen Street
ALBANY WA 6330

Dear Sir

Recently I spoke to officers of your department concerning the procedure for the completion of an Aboriginal Heritage Survey for the Ocean Beach Lime Quarry in Denmark.

It was advised to me that in the first instance you would convene a meeting of relevant people to determine the extent of the survey. Council requests that this meeting be held as soon as possible in order that the licensing of the quarry and the issue of a mining license can be proceeded with.

For your information enclosed is a copy of the Consultative Environmental Review prepared by Council's consultant.

Please contact me if you require further information.

Yours faithfully

P Durtanovich
Chief Executive Officer

enc

Appendix 6

Summary of submissions and proponent's response

Shire of Denmark
CONSULTATIVE ENVIRONMENTAL REVIEW
OCEAN BEACH LIMESAND PROJECT (ML70/908) DENMARK (1049)
QUESTIONS TO PROPONENT FROM PUBLIC SUBMISSIONS

1. Summary

1. The Denmark Conservation Society stated that if formalising the operation of the quarry will ensure that future operations are undertaken in a responsible way, in strict accordance with conditions, that is to be commended. However, if formalisation simply rubber stamps a continuation of what has occurred for the past 20 or more years, and is not enforced, it will be meaningless. How does the proponent respond to this?

Response
The old operation started in the days when few conditions were imposed and that was normal. The proposed operation will be on a Mining Lease and will have been through the formal environmental impact assessment process, so that the proponent's commitments and any conditions imposed become enforceable. The DEP has a role to play to ensure environmental compliance once the project has been approved.

2. The Denmark Conservation Society indicated that the EPA will be aware of correspondence dating back many years, from this organisation among others, dealing with the unacceptable way that operations at the quarry have been conducted in the past - to the point where the Minister for Lands in 1990 actually closed the quarry down. In making her decision Minister Kay Hallahan said she was concerned that conditions laid down by the Minister Wordsworth in 1981 '... have been substantially disregarded'; and that the pit '... is a commercial enterprise [on public land] with most of the income going to a private operator'. To date nothing has changed. How does the proponent respond to this?

Response
The Shire is seeking to upgrade the management of the quarry, and that is why it is being transferred to a Mining Lease. As part of the condition for approval by the Minister for the Environment, Ministerial conditions will be placed on the project. These will cover specific areas of environmental management.

3. The Denmark Conservation Society stated that the usefulness of agricultural lime as an aid to farming has never been disputed by the society. The central concern has always been that a finite resource exists on public land, in a district which could, on its own and in a favourable economic climate, consume the total annual allowable output. Should this high-grade but limited resource then be available to all takers? Notwithstanding some self-limitation through the cost of transport, a carte blanche approach will ultimately be a loss to farmers in the Shire of Denmark. Whether that loss occurs sooner or later will depend on the willingness by all parties to honour the terms and conditions associated with the granting of a mining tenement, and a realistic attitude to using the resource wisely and well. How does the proponent respond to this?

Response
The cost of transport limits the area over which the lime can be used. In addition Council has set a maximum extraction of 10,000 tonne per annum. This can be increased by Council, but only to a maximum of 20,000 tonne per annum.

4. The Denmark Conservation Society indicated that following DCS representations the Denmark Shire Council resolved in 1996 to limit distribution of agricultural lime from the Ocean Beach quarry to the Wilson Inlet catchment, the Shire of Denmark and the Walpole Ward of the Shire of Manjimup. This decision was taken on the basis that contemporary estimates gave the quarry a life expectancy of 40 years at an annual extraction rate of 10,000t as recommended by the DEP. In each year since more than 10,000t has been extracted – an estimated 14,000t in 1996/97 and about 13,000t in 1997/98. As a result Council in March this year effectively rescinded its 1996 decision, by permitting 13,000t to be extracted and sold. In doing so it ignored evidence that some lime from the Ocean Beach quarry had been used for purposes other than amelioration of soil acidity – as stockfeed supplement, for example – or questioning whether lime was being used responsibly or effectively. How does the proponent respond to this?

Response
The Council has set a limit of 10,000 tonnes/year. Council can increase this to up to 20,000 tonne per year, but would not exceed 20,000 tonne. The Council believes lime is being used responsibly and effectively. Short of policing every user's property it is difficult to prove otherwise.

5. The Denmark Conservation Society stated that on current extraction rates, and if AgWA's 'Time to Lime' campaign gains wide acceptance among farmers, the quarry's lifespan will be considerably less than 40 years: AgWA's estimates are that the Shire of Denmark alone should be applying 20,000t of agricultural lime per annum (A Miller, AgWA: Briefing Notes, 17/9/97). As well, pressures on the south coast environment from the extraction of limesand will continue to escalate if current landuse practices continue. How does the proponent respond to this?

Response
It is unlikely that all farmers will use the full rate, but the Shire cannot make any realistic estimate of the long-term demand. The present proposal seeks approval only for a maximum extraction of 20,000 tonne per annum. Council, at present, has restricted the extraction rate to 10,000 tonne per annum. The current proposal is seen as having an environmental benefit.

6. The Denmark Conservation Society strongly recommended that immediate research be undertaken by the DEP/AgWA into acid sulphate soils, and the identification of additional lime resources – preferably on private land. How does the proponent respond to this?

Response
The Shire supports this.

7. The Water and Rivers Commission pointed out that the CER indicates that there is some debate over the demand for lime sand. Future proposals to increase the extraction rate should be reviewed to assess the potential impacts. How does the proponent respond to this?

Response
Any change would automatically need separate approval. The present proposal seeks approval only for a maximum extraction of 20,000 tonne per annum. Council, at present, has restricted the extraction rate to 10,000 tonne per annum.

8. The Department of Land Administration explained that subject to the proposed excision from Class A Reserve 24913 "Parklands and Recreation" passing (via the tabling process as provided for under the provisions of section 43 of the Land Administration Act 1997) successfully through both Houses of Parliament a new reserve can be created for the purpose of "Mining". How does the proponent respond to this?

9. The Department of Land Administration pointed out that a Management Order (s46 of LAA 1997) can be issued to the Shire of Denmark over the new Reserve. An opportunity exists to incorporate management and land care conditions in the Management Order. The Shire of Denmark's commitments as summarised in the CER can accordingly be tailored and incorporated. How does the proponent respond to this?

Response (8 & 9)
The Shire would seek the simplest process as the land and its management will remain the responsibility of the Shire.

2. Commitments

1. The Denmark Conservation Society stated that the EPA should require the Shire of Denmark's rehabilitation commitments to include utilising the expertise of the Shire revegetation nursery manager and the Denmark Environment Centre in achieving the appropriate standard of rehabilitation. How does the proponent respond to this?

Response
The Shire will certainly be using local expertise and resources as much as possible during the rehabilitation process. Rehabilitation will be ongoing and will be undertaken in accordance with conditions set.

2. The DEP - South West Regional Office indicated that a vegetation/ rehabilitation management plan needs to be presented prior to the project proceeding to ensure topsoil is protected, disturbance minimised, walls managed, etc. How does the proponent respond to this?

Response
The CER outlines the management of these, and it is expected that a formal plan will be a condition once approval has been gained.

3. The DEP - South West Regional Office stated that "hours of trucking restricted" should be defined as to 'what hours?' How does the proponent respond to this?

Response
The quarry is never used at night and it is intended to restrict trucks to outside the times when school buses are on the road, i.e. not permitted on public holidays and not permitted between 8am and 9am and 3pm and 4pm on school days.

A speed limit of 60km/h is to be observed over the full length of Ocean Beach Road.

4. The DEP - South West Regional Office pointed out that hydrocarbon management, dust suppression, noise and water management will be administered by license and EP Regulations. How does the proponent respond to this?

Response
There is no license, however the Shire of Denmark agrees to meet the requirements of the EP Act.

5. The DEP - South West Regional Office indicated that a mine plan to be assessed with rehabilitation needs in mind (Department of Minerals and Energy concern). How does the proponent respond to this?

Response
The CER outlines the management proposed and it is expected that this will become part of the conditions. The proposed operation is very small and the mine plan is very simple so that no problems are expected in meeting the commitments.

3. Justification

1. The Denmark Conservation Society stated that the claim that there is '... no local alternative supply available' has no basis in fact. No study has ever been done to determine the truth or otherwise of such a claim. The 1993 Masters report surveyed only the immediate area of the existing quarry, and made a superficial assumption about a quarry on private land two kilometres to the west. DCS believes that AgWA should take immediate steps to locate alternative resources on the south coast, as part of its promotion of lime use in agricultural areas. How does the proponent respond to this?

Response
A detailed study of alternate deposits within the Shire of Denmark was undertaken by B K Masters, Environmental and Earth Science Consultants, in 1993. A copy of this report has been given to the Dept of Environmental Protection.

2. The Conservation Council of Western Australia indicated that surveys to find alternative sources on already cleared farmland have not been carried out. It is absolutely essential that the Department of Minerals and Energy and AgWA carry out surveys to find alternative sources on already cleared farmland. How does the proponent respond to this?

Response
As per response for 3.1 for within the Shire of Denmark. Council would support any regional survey.

3. The Conservation Council of Western Australia indicated that sourcing of limesands from reserves and remnant native vegetation should be phased out. How does the proponent respond to this?

Response
Most would support this if alternative supplies can be found on private non vegetated land.

4. The Denmark Conservation Society raised the question that the distribution and lifespan of the resource will remain unresolved in the formalisation process, except as they relate to maximum permissible annual tonnages. How does the proponent respond to this?

Response
This is correct, but the Shire cannot resolve the wider issues. The present proposal seeks to upgrade the environmental management of the site only at the present allowable rates of extraction.

5. The Denmark Environment Centre indicated that AgWA continue to promote the use of lime sand but still rely on a source within this A Class reserve. The DEC strongly recommends that lime sand be sourced from private land. How does the proponent respond to this?

Response
The Shire does not know of any resources on private property, but would consider closing down its operation if there were an alternative as it is only an accident of history that the Shire is the manager of this operation.

6. The Denmark Environment Centre stated that it strongly opposes any future extension of the minepit or mining lease areas beyond the proposed expansion. Current operations have already lead to the significant degradation of the ecology of the reserve. Any further extraction would constitute an unacceptable incursion on this coastal landscape. How does the proponent respond to this?

Response
There is no proposal for any future expansion.

4.2 Vegetation

1. The Denmark Conservation Society indicated that the value of a flora and fauna survey conducted over two months is questionable. How does the proponent respond to this?

Response
While more work can always be done, the survey was adequate for the size and nature of the proposed operation.

2. The Denmark Conservation Society indicated that it is also made clear in this section that no serious attempt has ever been made at rehabilitation; and that what little has been done involves exotic vegetation - not to mention a diverse weed population. It is an indictment of previous Shire Councils and the current operator that the site has been allowed to degrade to such an extent. How does the proponent respond to this?

Response
This is the reason that the proposal is being made. It is not true that exotic vegetation has been used to any extent (limited to a few trees on the east end), or that there is a diverse weed population in the rehabilitated areas (the weeds are virtually restricted to the cleared areas).

3. The Conservation Council of Western Australia stated that it is very concerned about the current standard of rehabilitation and therefore believes that commitments to rehabilitation need careful assessment and if allowed to proceed, careful monitoring. A requirement for expert assistance should be built into the conditions. Given this is an area within an A Class Reserve, the Council believes this is extremely important. The EPA should also require the proponent to address existing rehabilitation needs. How does the proponent respond to this?

Response
These issues have been identified as important in the CER and commitments have been made, and it is expected that rehabilitation issues will be a significant part of the conditions of approval.

4.3 Fauna

1. The Denmark Conservation Society stated that one sentence in this section sums it up: 'No useful comments can be made on invertebrate fauna'. How does the proponent respond to this?

Response
No useful comments can be made because there is so little information available on invertebrates that a survey would produce no useful result. There is nothing the Shire can do about this.

4.5 Noise and Dust

1. The Denmark Conservation Society indicated that one of the major social impacts of current operations at the quarry is inherent in the quarry's location, at the end of a narrow winding section of public road. Roadtrains operating around the clock 'in season' (November - May) coincide with high traffic volumes of tourist and others using the road to access the popular

Ocean Beach, increasing the risk of accidents. How does the proponent respond to this?

Response
There is no proposal for "roadtrains operating around the clock" and the road is adequate for trucks. The proposed use of the quarry is very limited, and trucks have to obey the road rules like anyone else. The only specific requirement the Shire will have is to keep trucks off the road when school buses are on the road; i.e. 8am to 9am and 3pm to 4pm. In addition roadtrains and extra mass vehicles are not permitted to use Ocean Beach Road on public holidays.

2. The Denmark Conservation Society pointed out that as well, 24-hour use of the road by heavy vehicles disturbs adjoining residents and creates dust and noise nuisances. The observation that '... no complaints have ever been received...' indicates that the research is inadequate, or presumptuous: various Shire Councillors can attest to receiving complaints from residents affected by roading operations during the carting 'season'. How does the proponent respond to this?

Response
There is no proposal for 24-hour use of the road, and there is no dust problem with the present trucking. Normal truck use on the roads is permissible. There was a number of verbal complaints re trucks, however since Council introduced restrictions on the time roadtrains can be used on Ocean Beach Road, there have been no further complaints received at this office.

3. The Denmark Conservation Society indicated that the truck movement figures presented hold true for the tonnage being removed from the pit, assuming an average load weight of 30t. However, the figure fails to recognise that truck movements are two-way, and are therefore double the number and frequency presented. How does the proponent respond to this?

Response
The calculation in the CER (up to 3/day average) is correct. At 25t/load, 10,000 tonnes will give 400 loaded trips and 400 unloaded, which is less than 3/day (800/365 days = 2.2) and 14,000 tonnes gives 3/day. The actual daily numbers will vary greatly, but the average is correct. The actual season can vary depending on weather conditions, however an average carting season is approximately 6 months, therefore, based on the above calculation, the vehicle movement for that period would be around 4 per day.

4. The Water and Rivers Commission pointed out that the CER stated that road safety is controlled by normal road rules (p20). However, the access road to the quarry is an extension of Ocean Beach Road and is highly used throughout summer. Conflict of road users does exist and the Shire of Denmark has taken steps to alleviate this problem by installing traffic calming devices and imposing a 30km/hr speed limit near recreational areas north of the quarry. It is considered that if quarry activities increase, conflict with recreational beach users may also increase. Truck movements should be

monitored and reviewed periodically to determine whether further road restrictions are required. How does the proponent respond to this?

Response
Council will monitor truck movements to determine whether further restrictions are required.

4.6 Groundwater

1. The Water and Rivers Commission pointed out that the CER indicated that there is a potential for groundwater contamination as a result of fuel or oil spills, but that this threat could be addressed through contract requirements and controls (p18). Any above ground fuel storage facility should be constructed and operated in accordance with the Commission's *Guidelines for the Siting and Installation of Above Ground Bulk Chemical Facilities*. The servicing of mechanical components involving liquids such as coolants, hydraulic oils, brake fluid or lubricants should not occur on site, unless the site manager can demonstrate implementation of an effective system for the capture and export of such liquids for recycling or approved disposal. How does the proponent respond to this?

Response
Agreed, these are standard conditions. The proposed operation is very small and simple, and no problem is seen in complying.

2. The Water and Rivers Commission stated that the CER does not address stormwater management on the site. The site should be managed so that stormwater runoff is retained on site. How does the proponent respond to this?

Response
There is no need for stormwater management because the site is small and highly porous. There is no evidence of problems in the existing operation over some decades.

4.7 Landscape Amenity

1. The Denmark Environment Centre indicated that the old part of the quarry requires immediate regeneration to mitigate the current visual impact. The visual impact of the quarry has escalated, and is now highly visible from Ocean Beach Road and most elevated parts of the Denmark townsite. How does the proponent respond to this?

Response
The visual impact of the quarry has not "escalated, and is now highly visible from Ocean Beach Road and most elevated parts of the Denmark townsite", as shown in photographs in the CER. The proposed operation will be even less visible. Nevertheless, Council is committed to an ongoing rehabilitation process.

4.8 Heritage

1. The Aboriginal Affairs Department stated that it is unable to comment at this time until the Shire of Denmark has undertaken an Aboriginal survey. I understand that this will be carried out in the future. How does the proponent respond to this?

Response
This commitment has been made and must be met before approval can be given.

2. The Denmark Conservation Society indicated that the evidence presented here is contrary to the facts: The Aboriginal Affairs Department in undated correspondence to the Denmark Conservation Society records the existence of one known Aboriginal site, Katelysia Rock Shelter, and acknowledges the possibility of other, unrecorded sites. How does the proponent respond to this?

Response
There are various known sites in the area but none on the site considered here. This will be covered in the survey that is going to be undertaken.

5. Public Consultation

1. The Denmark Conservation Society stated that the Shire Council has reversed its 1996 decision to restrict the distribution area of limesand from the quarry, so the report's comment in that regard is invalid. How does the proponent respond to this?

Response
Council, in December 1997, resolved not to restrict the distribution area. The distribution area is, to a large degree, determined by the cost of freight.

It is also pointed out that the distribution area is a matter for the Shire of Denmark to determine, it is not part of the Environmental Assessment.

2. The Denmark Conservation Society pointed out that the AgWA comment is paradoxical, in that it advocates unlimited distribution of limesand but argues that the maximum allowable annual extraction rate of 20,000t could be taken up by Denmark alone. How does the proponent respond to this?

Response
AgWA promotes the use of lime sand and would promote any source available. This is not paradoxical. The environmental or other assessment of any specific site is a separate matter beyond their concern or control. In this case their concern was that this supply might be limited unnecessarily.

3. The Denmark Conservation Society indicated that the quarry operator's comments do not bear examination. How does the proponent respond to this?

Response
The operator stated that limits on tonnage and areas of sale created commercial problems. Council is not in a position to determine a commercial operator's viability. However, the present contractor has operated the quarry for many years with an average output of around 10,000 tonne per annum.

6. The Proposal

1. The Denmark Conservation Society indicated that rehabilitation at the site has never been adequately implemented, resulting in an increasingly-visible scar on the landscape and the possible loss of valuable seed and brush material. The Society states that to the best of its knowledge no attempt has every been made to revegetate the site, with the only concession to environmental management being the removal and separation of overburden, in the form of a bank on the northern, visible edge of the quarry. How does the proponent respond to this?

Response
This is the reason that the proposal is being made. It should be remembered that the operation is decades old and goes back to an era when rehabilitation was not often even considered.

2. The Denmark Conservation Society and the Conservation Council of Western Australia indicated that they would strongly oppose any expansion of the quarry or mining lease areas beyond the currently-approved extension. Current operations have already led to significant degradation of the ecology of the reserve, and any further expansion would constitute an unacceptable incursion on this valuable coastal landscape. How does the proponent respond to this?

Response
There is no proposal for any future expansion.

3. The Denmark Conservation Society pointed out that while the report contains some errors of fact and unsubstantiated assumptions, it is generally adequate in addressing the core management issues under a formal lease arrangement. However, making rules and implementing them can be two different things. It is the Society's view that a formal arrangement will dramatically improve operation of the quarry, provided the EPA has the wherewithal to oversee and enforce it. How does the proponent respond to this?

Response
This is the reason that the proposal is being made. No errors of fact and unsubstantiated assumptions have been identified, so no comment can be made.

4. The Department of Minerals and Energy (DME) indicated that the public safety aspect of the existing quarry is adequately addressed, however DME indicated that the Shire of Denmark must maintain the fencing. How does the proponent respond to this?

Response
Agreed. The Shire retains responsibility for the site and will have to maintain the fencing.

5. DME indicated that the Annual Environmental Reporting and Review process required under the Mining Lease conditions (and undoubtedly any EPA approval) will provide the necessary mechanism to monitor and review on-going mining operations, rehabilitation and environmental impact. DME has indicated that this process would include representatives from DEP, DME, CALM, Shire and the Operator. How does the proponent respond to this?

Response
Agreed. It is expected that this will be a condition of approval.

6. DME indicated that the Mining Lease 70/908 is still pending. It will require Parliamentary concurrence to be granted due to its location within an "A" – Class Nature Reserve. How does the proponent respond to this?

Response
The site is not an A Class Nature Reserve (see CER), it is actually an A Class Parklands and Recreation Reserve.

7. DME indicated that the Shire of Denmark has yet to enter the Native Title process. How does the proponent respond to this?

Response
This was not done earlier to allow the environmental management and local matters to be addressed first.

8. The Water and Rivers Commission indicated that rehabilitation using stockpiled topsoil, which is removed prior to extraction of lime sand will help to provide a similar diversity of flora species as existed prior to extraction. However, the delay in utilising topsoil for rehabilitation is of concern. The document indicated on page 17 that 'there will be limited scope for this initially because it will be years before any final surfaces are completed...'. Delays in utilising topsoil have the potential to greatly reduce the viability of the seed bank and the effectiveness of rehabilitation. This should be considered when preparing a rehabilitation plan. How does the proponent respond to this?

Response
Some delay cannot be avoided, but it will certainly be minimised because of the cost benefit in rehabilitation.

9. The Denmark Environment Centre states that it is concerned about the proposed extensions to the area that the quarry supplies. The productive life of the quarry will be reduced from 40 years to 20 years. How does the proponent respond to this?

Response
Whilst there is now no restriction on the area the quarry can supply, the maximum extraction rate is still 10,000 tonne per annum under Council policy. Council can increase this to up to 20,000 tonne per year, but would not exceed 20,000 tonne.

10. The Denmark Environment Centre indicates that the enormous demand for agricultural lime is related in part to the regional problem of soil acidification. Pressures on the environment of the South Coast from the extraction of limesand will continue to escalate if current landuse practices continue. How does the proponent respond to this?

Response
The Shire is well aware of the environmental issues, but cannot resolve such regional issues. The current proposal is seen as having an environmental benefit, but whether this will be true in the future is not known.

7. Environmental Management

1. The Commissioner for Soils and Land Conservation indicated that under Regulation 4 of the Soil and Land Conservation Act, anyone wishing to clear more than 1 hectare of native vegetation for a change in land use must notify the Commissioner of Soil and Land Conservation at least 90 days prior to the intended commencement of clearing. This requirement applies to the quarry operations just as it does to clearing for other purposes. Has the proponent submitted a Notice of Intent to Clear for this proposal?

Response
The notice will be submitted when the project is further advanced.

2. The Commissioner for Soils and Land Conservation indicated that in this instance, it is expected that land degradation will be addressed by the proponent and the Environmental Protection Authority will set conditions for approval. How does the proponent respond to this?

3. The Commissioner for Soils and Land Conservation indicated that in this instance, it is expected that the Commissioner will be invited to comment on the appropriateness of these conditions. How does the proponent respond to this?

4. The Commissioner for Soils and Land Conservation indicated that in this instance, it is expected that the Commissioner will then have no objection to the clearing when he receives a formal Notice of Intent to Clear. How does the proponent respond to this?

5. The Commissioner for Soils and Land Conservation indicated that in this instance, it is expected that the Department of Environmental Protection either directly or by delegation to the Shire, will ensure compliance with the conditions set by the EPA.

Response (2,3,4 & 5)
Agreed. It is expected that these issues will be covered by the conditions.

6. The Commissioner for Soils and Land Conservation indicated that in this instance, although the lime sands are highly porous, there may need to be a provision such that during high intensity rainfall events, the water does not leave the site in a concentrated manner and cause off site damage. Similarly, it should not be possible for any water borne soil material to leave the quarry site. How does the proponent respond to this?

Response
No problems are expected because the site is small and highly porous. There is no evidence of problems in the existing operation over some decades.

7. The Water and Rivers Commission indicates that the search for alternative uses for the existing deep quarry is supported. Future rehabilitation proposals for the existing deep quarry should be referred to the Commission for comment. The preferred option would be for the site to be back-filled with inert fill, as indicated in the CER. How does the proponent respond to this?

Response
Agreed. No decision has been made because there is no clear answer available. The Shire has made a commitment to further public consultation.

8. The DEP – South West Regional Office indicated that a due date of the rehabilitation plan is needed, also regular review and reporting of rehabilitation efforts/objectives in the future (only simple report required). How does the proponent respond to this?

Response
Agreed. These are standard conditions.

9. The DEP – South West Regional Office stated that management of exposed southern (vertical) face and sides should involve minimal disturbance of the surrounding vegetation, except the application of (clean) topsoil from the new quarry area or other similar landscapes (eg. prior to road building) to expedite rehabilitation. Although it would be preferable not to have any steep drops/exposed faces after final rehabilitation, the DEP – South West Regional Office agrees with the report's comments that it is more important to minimise future disturbance in this 'fragile?' area. How does the proponent respond to this?

Response
Agreed. No decision has been made because there is no clear answer available. The Shire has made commitments not to break down the walls because this will greatly increase the area of disturbance, and to fence off the top, but the final answer will depend on whether any fill can be found. Some other decision will have to be made if no fill can be found after some years.

10. The DEP – South West Regional Office indicated that prevailing winds have shaped the existing environment. The rehabilitation plan needs to recognise this. How does the proponent respond to this?

Response
The site is on the lee of a large aeolian dune, which is now cemented, and although the site is windy and exposed, no problems are expected because the natural vegetation grows well on these lee slopes.

11. The DEP – South West Regional Office indicated that any fill should be 'quarantined' or otherwise sanitised before being incorporated into the void rehabilitation. Fill should be concentrated against the void walls to minimise face sizes. How does the proponent respond to this?

Response
Agreed. At this stage the main problem is to obtain significant quantities of fill as there is a big demand and few supplies in the Denmark area.

12. The DEP – South West Regional Office stated that a completion date for rehabilitation needs to be negotiated – also a closure date to prevent unauthorised dumping of fill (weeds, disturbance, etc). How does the proponent respond to this?

Response
Agreed. This is expected to be part of the conditions. No problem is expected with unauthorised dumping as the site is locked.

13. The DEP – South West Regional Office points out that a fire management plan should be generated and put in place to protect the rehabilitated area from such disturbances as much as possible. How does the proponent respond to this?

Response
This is a difficult issue because cleared firebreaks are not desirable for the young vegetation. The best option may be slash down the surrounding vegetation and burn off these in winter to provide effective fire protection. This would be decided as areas become available for rehabilitation. Council is in the process, in conjunction with the Bush Fire Services Department, of preparing a fire management plan for the Shire of Denmark. This plan will specifically address this reserve.

14. The Denmark Environment Centre (DEC) stated that revegetation commitments at this site have not been adhered to in the past. The DEC stresses the importance of regeneration of the site to A Class Reserve status following extraction of the resource. The EPA must clearly require the Shire of Denmark's rehabilitation commitments (p.iii) to include the full utilisation of the expertise of the Shire revegetation nursery and the DEC in achieving this standard. How does the proponent respond to this?

Response

The Shire will certainly be using local expertise and resources as much as possible, but it is inappropriate to make such specific conditions for work which may not be carried out for some years.