REVIEW OF THE
ESPERANCE PORT AUTHORITY
IRON ORE EXPORT PROPOSAL
CONSULTATIVE ENVIRONMENTAL REVIEW

PREPARED ON BEHALF OF

THE ESPERANCE CHAMBER OF COMMERCE
AND INDUSTRY
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1 INTRODUCTION

1.1 THIS SUBMISSION

This review of the Esperance Port Authority Iron Ore Export Proposal Consultative Environmental Review has been prepared by LeProvost Environmental Consultants on behalf of the Esperance Chamber of Commerce and Industry as part of a public submission by the Chamber to the Environmental Protection Authority. The review has been jointly funded by the Chamber and the Shire of Esperance.

The Esperance Chamber of Commerce and Industry has a membership of 115 and represents the majority of commercial and industrial businesses operating in the town of Esperance. The businesses represented by the Chamber employ approximately 2,200 people.

The Shire of Esperance has a population of 11,300 persons some 8,500 of whom reside in Esperance, which is the largest town and only port of the region.

Both the Chamber and the Shire support the introduction of new industries to the town where it can be shown that those industries complement the existing development of the town and will not adversely impact on the lifestyle or existing industries. In this context the protection of the environment is accorded the highest priority by both the Shire and the Chamber of Commerce, in recognition of the importance of the environment to the future growth and development of the town and the shire.

1.2 THE PROPOSAL

The Esperance Port Authority (the Port Authority) proposes to undertake the export of 1.5 million tonnes per annum of iron ore from Koolyanobbing through the port of Esperance. The Port Authority’s environmental responsibility for the project includes the rail transport of the ore through Esperance, unloading and stockpiling of the ore on Port Authority land at the port, and the loading of bulk ore carriers.
Further to the description of the proposal presented in the CER, the Port Authority has announced that it is investigating two amendments to the proposal which would extensively modify the scale of the potential impacts of the project. The amendments under consideration are:

- the enclosure of the stockpile; and
- the extension of the railway line onto the port breakwater to allow complete ore trains to enter the port area.

1.3 THE IMPACTS

The following impacts of the project have been identified from the CER, discussions with local residents, and from the previous experience of the consultants with iron ore export facilities.

Impacts on the social environment:

- visual pollution, including staining and dust coating of natural features such as beaches and vegetation, and of buildings and vehicles, adverse effects on lifestyle through avoidance of dust affected areas, increased maintenance costs to maintain the appearance of buildings, reduced property values, and adverse impacts on the tourist trade and the potential for further growth of the town as a retirement area;
- increased noise levels and greater frequency and duration of noise impact in the port area;
- increased danger at rail crossings due to increased train frequency;
- extended delays at rail crossings;
- visual impact of the stockpile as viewed from the town and adjacent residential areas;
- effects of port illumination on adjacent residents; and
- effect of potential upgrading of electricity supply to the port to meet the requirements of this project.

Impacts on the natural environment:

- impact of dust on vegetation in the vicinity of the railway and the port;
- staining of natural features, particularly the white sand beaches of Esperance (This is also one of the principal social impacts);
• accumulation of iron ore dust and fines in the waters and on the seafloor in the port area;

• iron contamination of the groundwater leading to staining of the beaches at the seawater interface; and

• increased risk of introduction of exotic marine organisms in ballast water.

1.4 STRUCTURE OF THIS REPORT

Section 2 of this report contains an appraisal of the CER, focussing on the impacts and their proposed management. Section 3 contains an appraisal of modifications to the proposal put forward by the Port Authority since the release of the CER, while the implications of future expansion of the project, suggested by Portman Mining on a number of occasions, are discussed in Section 4.

The conclusions drawn from the review of the CER are presented in Section 5, followed by LEC's recommendations on the proposal, which are presented in Section 6.
2 APPRAISAL OF THE CONSULTATIVE ENVIRONMENTAL REVIEW

The CER identifies the majority of the impacts of the proposal, the exceptions being the impact of groundwater extraction, the possible need for additional electricity generating capacity to meet the needs of the port and the increased risk of introduction of marine organisms in ballast water.

A comprehensive list of commitments is made, e.g. ‘contain fugitive dust emissions of iron ore to within the Port Authority boundary through adoption of efficient dust control measures’ (Commitment 8.3), however, no performance standards are stated in a number of cases, e.g. ‘minimise noise to a best possible degree’ (Commitment 8.4), nor are alternatives stated, should the proposed measures prove not to be effective.

2.1 INTRODUCTION

The introduction identifies (by inference only) the Esperance Port Authority as the proponent for a proposal to receive, stockpile and export 1.5 million tonnes of iron ore per annum for Portman Mining Ltd. The aims of the CER are outlined and the proposal is described.

However, it is not clear from the description of the project at what point the Port Authority takes over environmental responsibility (as Proponent) for the transport of the ore from Koolyanobbing. The CER refers only to impacts on Esperance and the port, and it is therefore assumed that the impacts of ore transport on other centres the railway passes through will be the responsibility of Portman or a third party (e.g. Westrail).

The impacts of ore trains on other centres would be similar to those at Esperance, i.e. noise and potential dust emissions.

The relative areas of responsibility therefore need to be clarified and the impacts of the project on other areas assessed, either by the Port Authority or a separate proponent, as appropriate.

2.2 ALTERNATIVES

The CER identifies two potential bulk export ports to serve the Portman iron ore export project, Esperance and Kwinana.

Other than comment on the financial benefits of the project to Esperance (CER, Section 5) no assessment of the relative environmental impacts or benefits of the two alternatives is made. Such an assessment would be considered appropriate as the Kwinana site is located within a heavy industrial zone with a substantial (>1 km) buffer to residential development and has previously been used for the
stockpiling and export of iron ore, while the Esperance port facilities are located in close proximity to residential development (<100 m) and, while used for bulk export, have not previously been used for the export of iron ore.

The CER argues against the use of Kwinana citing a requirement for the extensive repair and upgrading of equipment required to manage iron ore transfer at Kwinana (reference is made to a review by Portman Resources N.L.), and that Esperance is capable of handling deeper draft vessels (CER Section 2).

Reference to current marine navigation charts shows that the depth of the harbour at Esperance is 11.6 m below the Lowest Astronomical Tide (LAT) depth (Chart AUS 119, Approaches to Esperance) while that of the Stirling Channel, which is the approach channel to the jetty at Kwinana, is dredged to a depth of 11.8 m below LAT while the jetty berth (North Jetty) and turning basin, which covers an area approximately 1,000 m by 500 m, is dredged to 11.2 m below LAT (Chart AUS 117, Gage Roads and Cockburn Sound), confirming that the berths at Esperance are 0.4 m deeper than the BHP North Jetty at Kwinana.

There are alternate bulk terminal facilities at Kwinana capable of handling deeper draft vessels, however these are not at present supported by the same level of rail infrastructure.

The relative costs of repairing and upgrading the equipment and berth at Kwinana as opposed to the provision of new equipment at Esperance versus the cost advantages of shorter shipping distances from Kwinana to receiving ports in China, as compared to Esperance, are not discussed.

### 2.3 EXISTING ENVIRONMENT

#### 2.3.1 General

The CER locates the port within the context of existing development of the town and refers also to the residential development to the south and south-west.

Residential development in this area is on-going and therefore is likely to be a continuing source of conflict with any future uses of the port. Planning for the area does not take into consideration the unavoidable impacts of port activities and incorporate a suitable buffer between the port and residential development.

#### 2.3.2 Groundwater/Marine

The CER provides information on pre-pumping groundwater contours and flow directions for the town and port area but does not indicate if these have been modified by subsequent pumping.
The proposed stockpile area is located on low-lying land between 2 m and 4 m AHD (Esperance CG29/07.05W Orthophotomap) and consequently the depth to water table within the port area is estimated to be between 1.5 and 3.5 m, assuming modifications to groundwater contours in the port area have not changed substantially.

The floors of the proposed soakage pits would therefore be located close to the water table and, due to the proximity of the port area to the ocean, leaching time from the soakage pits to the ocean would be expected to be comparatively short.

No data is provided on the composition of the groundwater and its potential reactivity with iron ore fines which would be deposited in the soakage pits, information that is considered relevant to determining whether or not iron in solution would be carried by the groundwater toward the adjacent beaches, where iron staining of the beach sands could occur.

### 2.3.3 Meteorology

The CER provides a brief description of climatic factors, including a comment on prevailing winds, with a wind rose showing percentage wind direction occurrence for the whole year.

A more detailed interpretation of wind data is provided in an earlier report by the Port Authority dated January 1993 (Esperance Port Authority, Proposal to Export Iron Ore Through the Port of Esperance, January 1993).

This data clearly shows that during spring and summer winds from the south and south-east predominate and typically exceed 10 km/h, with the majority in the range between 20 and 50 km/h. Winds from this direction potentially affect the greatest area of the town and local beaches.

The January 1993 report also acknowledges that 'it is the south-east winds which are most prevalent and strongest, particularly in the summer months, that have the potential to carry dust over the town'.

This relationship between wind speed and direction and potential dust transportation, and the implications for the management of dust impacts is not explored in the CER.

### 2.3.4 Noise

The CER presents a summary and assessment of the results of a study commissioned by the Port Authority and undertaken by KENRAC Consultancy on background noise levels at three sites in the vicinity of the port.
The CER acknowledges, on the basis of this investigation, that port activities impact on these locations to varying degrees depending on the activity being undertaken in the port, and on weather conditions.

The report quotes noise levels at Bostock Street during nickel loading on 20 March 1993 as having $L_{eq}$ values of between 44 and 46 dB(A) with a peak value of 59 dB(A).

Reference to the KENRAC report however shows that the peak value recorded on this day was 90 dB(A), a value which occurred during the period that soda ash was being unloaded. The peak value measured during the period that nickel may have been being loaded was 82 dB(A), however, the notes accompanying the KENRAC report indicate that due to start-up problems with the new shiploader nickel loading was minimal, and only took place over about 2 hours in the period 0800 to 2400 on that day. As a consequence it cannot be confirmed that noise readings were taken during periods when nickel loading was actually taking place.

As a background study, the KENRAC report provides only limited data on noise levels in the vicinity of the port and on the relationship between specific port activities and their contribution to overall noise levels.

Intrusive noise from two port activities were, however, identified during this study, reversing 'beeper' noise and hammering. The use of alternative warning devices (discussed in the CER) and confinement of maintenance activities to daytime working hours wherever possible are strategies which would assist in reducing these types of annoying noise.

2.3.5 Dust

A summary is presented, and reference is made, to a baseline survey undertaken between 8 March 1993 and 27 March 1993. Although referred to as Appendix 2 of the report the detailed results of the dust survey are not presented in the CER. A copy was however, obtained from the Esperance Port Authority for the purposes of this review.

No relationship between existing and proposed port activities is claimed or can be assumed from this investigation.

As with the noise study, the baseline dust studies provide limited information due to the short period over which the data was collected. Consequently, annual mean values for Total Suspended Particulates, on which the National Health and Medical Research Council goals are based, could not be calculated.

The study results for the four locations tested were based on sequential testing and thus it is not possible to relate dust generated by port activities to dust levels at other monitoring points.
For the period of the test:

- ambient dust levels at the town site (Shire offices) were low (0.008 to 0.018 mg/m³); and

- dust levels at the port boundary from existing operations exceeded the USEPA 24 hour standard on one occasion;

It is relevant to note that the highest daily rainfall recorded during the dust monitoring period (20.4 mm) occurred on the 19th of March, the same day that the highest dust level was recorded. The benefits of local climatic factors, such as rainfall and humidity, as aids to controlling dust must therefore be questioned.

### 2.4 ENVIRONMENTAL MANAGEMENT

#### 2.4.1 General

The CER identifies the environmental issues requiring management as the control of dust, noise, drainage, visual impact and light spill during construction and operation of the facility.

Impacts arising from the supply of groundwater and electricity to the project, the effects of leaching of iron contaminated groundwater at the seawater interface, and the increased potential for the introduction of exotic marine organisms via ballast water are not discussed.

#### 2.4.2 Dust

The CER identifies the following potential sources of dust associated with the project:

- during transportation (i.e. from loaded ore wagons);
- during transfer of iron ore to the Receival Hopper (i.e. from the rotary car dumper unit);
- during transfer to the stockpiles via the Double Arm Stacker;
- wind blown dust from the stockpiles;
- during transfer of the ore from the stockpile to the Portable Feed Hopper;
- during conveying to the ship;
- during loading operations into the ship; and
- as a result of vehicular movement within and outside the stockpile area.

The potential for the generation of dust during the transfer of ore to the stockpiles via the Radial Arm Stacker (which is not mentioned in the CER as a source of dust generation) is presumably the same as for the Double Arm Stacker. Since the two
stackers will not be operated simultaneously, short term dust generation from stacking operations would not be increased by the presence of the second stacker.

The potential impacts of iron ore dust emission are:

- staining of beaches;
- dust coating, and in extreme cases, physical damage to vegetation;
- accumulation of dust on surfaces and staining of residential and commercial buildings;
- accumulation of dust on motor vehicles, vessels moored in the adjacent marinas, and on other static surfaces;
- increased maintenance costs;
- adverse impacts on property values; and
- reduced attractiveness of the town to potential residents and tourists, with consequent loss of revenue to the town.

Because of its ability to bond both physically and chemically with a wide range of surfaces iron ore dust tends to be persistent in the environment and may produce a significant impact when present at quite low levels over an extended period, producing an effect similar in some respects to bore water staining.

Details of the dust suppression measures to be implemented for each of the identified impact areas are presented in Sections 4.2.1 to 4.2.6 of the CER. However, no estimates of the individual or cumulative level of dust emissions that could be expected from these operations are provided, nor is there any documented evidence of the effectiveness of the proposed control methods in achieving the containment of dust emissions to within the Port Authority Boundary (Commitment 8.3).

The dust emission standard to be adopted, stated as 'no emission of iron ore dust beyond the port boundaries', needs to be reviewed as it is inevitable that some dust will escape the site and therefore that this commitment could not be met in its present form. For regulatory purposes it is important to define at what point such levels are 'legally' unacceptable and to describe the action to be taken in the event that such levels are exceeded, e.g. suspend activities until such time as the dust source is contained.

The dust standard for this operation needs to take into account the impacts caused by this particular type of dust, the receiving environment, the proximity of adjacent development and climatic factors, particularly the effects of persistent strong winds.

With the strong winds experienced in Esperance the sometimes quoted standard of 0.090 mg/m³ may well prove to be unacceptably high.

There is no review or assessment of whether or not the proposed (or any alternative) measures are capable of achieving the levels of dust suppression stated in the commitment. As dust control to this level is not presently achieved for any
similar operation in Australia such a study should be undertaken by the Port Authority to support the commitment that they have given.

No indication is given of what action will be undertaken in the event that the Port Authority, after taking all feasible measures, is unable to meet the very stringent standards that it has set itself.

2.4.2.1 Supply of water for dust suppression

The Water Authority of Western Australia has indicated that sufficient groundwater is available to meet the requirements of the project. It is anticipated that the Environmental Protection Authority will seek confirmation of this statement from WAWA, together with an assessment of the long term affect on future groundwater requirements for the town of Esperance resulting from water use by this project.

Enclosure of the stockpile would potentially reduce the volume of water required for dust suppression, thereby releasing groundwater for other purposes. This would also have the benefit of reducing the operational costs of the Port Authority.

2.4.3 Noise

The principal sources of noise associated with the project are described in the CER as rail noise and as a result of increased activity within the port.

Noise impacts are determined by:

- sound levels (volume);
- composition (frequency mix) of sound;
- duration; and
- time of day of noise impact.

However, as response to noise varies from individual to individual and to some extent by the same individual at different times depending on circumstances and activity being undertaken at the time, it is not possible to provide a figure which determines whether or not noise levels will be acceptable to everyone affected.

The impact of rail noise is discussed under Section 2.4.4, Rail Operations. The remainder of this section is a discussion of noise resulting from activities within the port area.

There are a number of discreet sources of noise associated with the port related activities of the project. In summary these are:

- rotary car dumper unit;
- ore transfer systems (conveyors);
- ore stackers - travelling and radial;
- front end loaders;
- shiploader; and
- dust spray sprinklers and ancillary equipment - pumps, sweepers etc.

No noise levels have been quoted for these operations, however, the Port Authority has made a commitment to 'minimise noise to a best practicable degree' (Commitment 8.4) and has identified strategies to assist in this regard including:

- purchase of equipment with a low sound power rating;
- installation of sound attenuation measures; and
- minimising late night rail movement.

A separate report, Environmental Noise Report for Esperance Port Authority, on background noise levels associated with some facets of current port activities has been prepared by KENRAC Consultancy on behalf of the Port Authority.

The activities covered by this report, however, are dissimilar to those associated with the current proposal and hence no direct comparisons can be drawn.

Noise levels associated with iron ore transfer, however, can be expected to be higher, particularly for the transfer of lump ore, than for finer grain materials such as nickel concentrate, fertilizer or wheat. The rotary car dumper and ore stacker operations will be new to the port and will be additional noise sources. Stacking and loading operations will also be conducted on a more frequent basis and over longer periods than current port activities.

The reflection of noise from Dempster Head, located immediately to the south of the Port Authority area has also been observed and this may affect noise levels in parts of Esperance, either generally or by focussing and amplifying noise levels in particular locations, depending on the locations of the various facilities to be constructed.

The CER states that there will be an increased level of noise as a result of the project but does not provide any information by way of actual sound levels or a description of the level of impact that can be anticipated.

As there are no comparable operations currently carried out within the port area it is not possible for potentially affected individuals to judge for themselves what impact the current proposal may have on their commercial activities or private lives.

2.4.4 Rail Operations

The perceived impacts of the rail operation on the town of Esperance are dust, noise, crossing safety and delays at crossings.
2.4.4.1 Dust

The project calls for an average of one train per day of 65 open wagons containing a total of 4,000 tonnes of iron ore.

The Port Authority has stated, on the basis of discussions with Westrail and Portman, that any loose dust in the wagons will be blown off the wagons in the first few kilometres after leaving the Koolyanobbing minesite and will not therefore pose a problem by the time the train reaches Esperance. This opinion has been supported by Westrail staff based on personal experience of working with ore trains (J. Goodall, Westrail, pers. comm.). This viewpoint has, however, been contradicted in press statements and at the Esperance public meeting by people who have visited or lived at Dampier or Port Hedland and claim that dust is visible above wagons arriving at the port facilities in those towns, from the minesites.

No measurement of dust has been presented or obtained from other sources which supports either conclusion.

The CER makes no reference to the management of dust retained on the empty wagons once they have passed through the dumper.

The perceived impacts of dust generated by rail transport are a general increase in the levels of iron ore dust in the atmosphere in Esperance, accumulation of dust on commercial and residential premises and property in the vicinity of the railway line and death or visual degradation of vegetation within or adjacent to the railway reserve. The principal impact identified is therefore degradation of the visual environment, although additional costs in maintenance and cleaning, and reduction of property values in affected areas are also concerns. Values of certain types of business close to the railway line, for example the caravan park, may be reduced.

2.4.4.2 Noise

Differing noise regimes will be associated with loaded trains travelling toward the port, empty trains travelling away from the port and with train halts (braking), shunting operations and trains under acceleration.

The potential options are for the train to travel directly through Esperance to the port, and for the train to be split at the Esperance siding. The former would be the quietest option but under the current proposal it appears that the train would have to be split due to space limitations within the port authority site.

With the split train option the two halves would proceed to the port in sequence from the siding before returning empty, to be rejoined for the return journey to Koolyanobbing. The additional noise generated at the Esperance siding would depend on the make-up of the train and on whether it can be separated without the need for shunting and re-arrangement of engines, etc. The need to split the train would also result in overall decreases in train speed over the whole of the
Esperance sector due to the additional stop and associated braking and acceleration times.

The CER provides no data on the noise levels which might be associated with any of these activities.

A commitment by the Port Authority to implement noise control measures, for example the construction of noise bunds, to reduce the impacts at specific locations in the event that noise levels are considered excessive, should be provided.

2.4.4.3 Safety at rail crossings

Current rail crossings are protected by warning signs and either flashing lights (town crossings) or stop signs. Westrail considers that these provisions are adequate for the level of additional traffic which will be generated by this project (J. Goodall, Westrail, pers. comm.).

Two sites of specific concern have been identified in discussion with Esperance residents where there are potential problems at intersections adjacent to rail crossings. These are:

- Pink Lake Road crossing; and
- The Esplanade crossing

The Pink Lake Road/Harbour Road intersection is of concern because Pink Lake Road is the major road linking east and west Esperance, providing access to the commercial centre, high school, TAFE and tourist attractions. As such it carries significant traffic loads at the start of the work day and end of the school and working day. A train at these times causes a back-up of traffic which is compounded in its effect by a road (Harbour Road) running parallel to the railway line which causes traffic backup at the adjacent intersections.

This impact can be reduced provided that rail schedules can be adjusted to avoid crossings at peak traffic times. However, this cannot be confirmed.

The Esplanade crossing is of concern because, in addition to its residential and tourist traffic loads, it is also on the main route for road trains carrying grain and other bulk materials into and out of the port. There is a concern that road trains will block the intersection at these times because of the right turning movements required at the Harbour Road/Esplanade intersection.

It may be possible for the Port Authority to modify its internal road network with a view to removing the need to cross the rail line outside of the port area and thereby eliminate traffic congestion at the Esplanade crossing.

These are however existing problems which will be exacerbated by, but are not confined to the iron ore export proposal. A combined review of road and rail traffic
management by the Shire, Westrail and the Port Authority to determine a strategy for resolving this issue prior to further increases in road or rail traffic is therefore warranted.

2.4.4.4 Delays at rail crossings

The CER has stated that the average speed of the train between Koolyanobbing and Esperance will be 30 km/h (CER p.18) and that delays at rail crossings will be approximately 2 minutes for a 65 wagon train carrying 4,000 tonnes of ore (CER p.44).

However, as trains will be slowing and braking as they approach Esperance, and accelerating as they leave, these averaged figures provide an inappropriate basis for an estimation of the delays which will be experienced at town crossings.

As previously discussed the frequency and duration of delays will vary depending on whether or not the train is split at the Esperance siding. However, as the Esplanade crossing could remain blocked for more than an hour during unloading of the leading wagons of a 65 wagon train with the lay-out of facilities as described in the CER, it may be assumed that the train would have to be split.

Westrail has confirmed that the train length will be approximately 700 m in length and therefore the half train length will be approximately 350 m. Taking the length as 700 m the following delays would be experienced at the nominated speeds:

<table>
<thead>
<tr>
<th>Speed (km/h)</th>
<th>Delay (min)</th>
</tr>
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<tbody>
<tr>
<td>30</td>
<td>1.4</td>
</tr>
<tr>
<td>20</td>
<td>2.1</td>
</tr>
<tr>
<td>15</td>
<td>2.8</td>
</tr>
<tr>
<td>10</td>
<td>4.2</td>
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<tr>
<td>5</td>
<td>8.4</td>
</tr>
</tbody>
</table>

Delays for the half train based on a length of 350 m would be:

<table>
<thead>
<tr>
<th>Speed (km/h)</th>
<th>Delay (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1.4</td>
</tr>
<tr>
<td>10</td>
<td>2.1</td>
</tr>
<tr>
<td>5</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Estimates of train speed at the Pink Lake Road and The Esplanade crossings are 20 km/h and 15 km/h respectively (John Goodall, Westrail, pers. comm.).

The delays at these crossings for a full train are therefore estimated to be 2.4 minutes at the Pink Lake Road crossing and 3.1 minutes at the Esplanade crossing, allowing an additional 20 seconds for the warning period at each crossing.
Crossing delays as a result of this project will occur twice per day (on average) in the case of the full train and four times per day in the case of the half train. In the latter case delays at the Pink Lake Road crossing will be modified by acceleration and deceleration times as a result of the halt at the Esperance siding.

With present rail traffic these will be the only delays due to trains for much of the year, however for 6 to 8 weeks each year there will be an average of one additional train each day carrying grain.

2.4.5 Drainage

The Port Authority has made a commitment to ensure that stormwater run-off from the stockpiles does not directly enter the marine environment (Commitment 8.8). In the text it is stated that three soakage pits with sufficient capacity to contain stormwater up to a 20 minute storm event will be provided.

The potential frequency of exceedence of such an event at Esperance has not been discussed, nor has the action that would be taken in the event that such an exceedence event was to occur. The proposed stormwater management strategy therefore needs to be evaluated to determine the safety factor required, the ability of the Port Authority to provide containment to this level and the action to be taken by the Port Authority in the event that spillage occurs.

A verbal commitment was subsequently made at the public meeting by the General Manager of the Port Authority that this proposal would be amended as necessary to ensure the containment of all run-off from the stockpiles, which is consistent with the commitment given in the CER. Further investigation is required to confirm that containment of the maximum storm event is feasible within the constraints of the available land area.

The Port Authority area is one of high water table with groundwater flow toward the port and adjacent beaches (see Figure 3.2 of the CER). The potential for the leaching of iron in solution from the stockpiles or soakage pits into the groundwater, with subsequent staining of beaches at the zone of discharge, which occurs within 100 m of the proposed soakage pits, needs to be reviewed.

Staining of beach sands is a problem that in the past occurred extensively on the shoreline of the Leschenault Peninsula, as a result of iron effluent discharges into the dune system. It is noted that for such an event to occur at Esperance it would first be necessary for the iron to go into solution through a chemical reaction between the ore and the groundwater or other potential contents of the storage pits. However, this is a possibility that requires assessment in reviewing the proposed stormwater containment strategy.

Mechanisms for the collection of run-off containing dust from wash-down areas and from the wharf area also need to be reviewed.
2.4.6 Ballast Water

The increased potential for the introduction of exotic marine organisms as a result of the major increase in shipping which will occur as part of this project has not been reviewed.

The claim was made at the Esperance public meeting by a former Port Authority worker that the quality of ballast water discharged in Esperance harbour did not, at least on occasion, appear to conform with that which should be achieved if the current guidelines for ballasting were being followed. That this could occur on occasion is consistent with Australian Quarantine and Inspection Service (AQIS) estimates that compliance with the guidelines currently runs at about 80% Australia wide (P. Mills, AQIS, Canberra, pers. comm.). AQIS manages the discharge of ballast water, which has the potential to provide a mechanism for the introduction of exotic marine organisms, in Australian waters under international guidelines for the control of ballast water and sediment discharge. The international guidelines currently rely on voluntary compliance.

As the proposed iron ore trade will occur throughout the year between temperate ports located north and south of the equator the potential for the successful introduction of exotic marine organisms to the waters around Esperance will increase. Such introductions could impact on commercial and recreational fishing, on marine water quality and its suitability for recreational purposes, and on the potential for mariculture operations.

In view of the major increase in port use that will arise from the approval of this project, a baseline survey of marine organisms presently occurring within the Esperance port should be undertaken. This should be followed by regular monitoring of target organisms such as toxic dinoflagellates. Regular monitoring of the quality of discharged ballast water to confirm that it complies with International guidelines and AQIS regulations should also be undertaken.

2.4.7 Electricity Supply

SECWA has advised the Shire engineer that it may not be able to provide the total energy requirement of the port for the proposed operation, based on current estimates. This may either require reduction in proposed use by the port or an increase in generating capacity by SECWA. Options to meet the requirements of the port should therefore be reviewed and potential impacts addressed by the Port Authority or SECWA, as appropriate.

2.4.8 Vegetation Screening

The proponent proposes, following approval to construct the facility, to ‘provide sufficient vegetation around the stockpile area to screen the stockpiles thus reducing aesthetic impact’. On the basis of existing vegetation growth in the port
area it would appear that this is a realistic long-term expectation, however, no information is provided on:

- species to be planted
- success and growth rates of these species in similar locations in Esperance
- the timing of planting in relation to the date that stockpiling will commence

This information would assist in determining what delay might be anticipated between planting and the time at which an effective vegetation screen is established.

A review of this commitment will be required in the event that the stockpile is enclosed due to changed requirements. For example, construction of a shed which is taller than the presently proposed stockpile may require the use of different tree species to achieve the necessary height. It will be necessary to determine whether trees can be successfully established and grow to the required height in this location, and also that they will grow quickly enough to form an effective screen at an early stage of the project's life.

2.5 BENEFITS OF THE PROPOSAL

The benefits of the project are quoted as economic, including export income, and regional and local economic benefits, employment, and provision of port infrastructure.

No adverse economic impacts are forecast, provided that the management commitments made by the Port Authority can be met.

2.6 SOCIAL IMPACT AND PUBLIC CONSULTATION

2.6.1 Introduction

The CER highlights the importance of the port and tourist industries to Esperance.

Other aspects of the economic base which are not mentioned in this section and may be of equal or greater significance are the importance of the town as an agricultural service centre and as a retirement area.

2.6.2 Social Aspects of Esperance

2.6.2.1 General

The CER comments on the increasing age structure of Esperance.
Discussion with the local authority indicates that a substantial part of this increase is due to the attractiveness of the town as a retirement area, particularly for persons residing in the Goldfields Region.

2.6.2.2 The port

The CER summarises the history of port development at Esperance and the materials handled.

However, no information on materials or tonnages handled in recent times, which could be used to draw a comparison between the present and proposed levels of activity is provided.

2.6.2.3 Public consultation

The public consultation activities undertaken by the Port Authority in the lead-up to the release of the CER are described in this section of the report.

However, the Chamber in commissioning this review has expressed concern that the information provided by the Port Authority during the public consultation process has not included sufficient factual information on the scale of the impacts to allow members of the public to assess the likely effects of the project.

2.6.2.4 Summary of concerns related to the proposal

The summary of concerns presented in this section of the CER appears to accurately reflect the issues of concern as raised by Members of the Chamber and Shire, and the public at the Esperance public meeting.

2.7 RESPONSES TO COMMUNITY CONCERNS

This section provides some further comment on queries raised by members of the public during open days and through other consultation.

No additional data is provided on the major issues of dust or noise that assist in clarifying the level of impact that can be anticipated, or the capacity of the proposed management procedures to meet the commitments given by the Port Authority.
3 PROJECT MODIFICATIONS BEING CONSIDERED BY THE ESPERANCE PORT AUTHORITY

Since the release of the CER the Port Authority has released a statement identifying two modifications to the proposal that are being considered in an effort to reduce the impact of the project and make it more acceptable to the residents of Esperance. These are discussed below.

3.1 ENCLOSING THE STOCKPILE AND STACKERS

3.1.1 Potential Benefits of Enclosing the Stockpile

The following potential benefits may accrue from suggested proposals to enclose the stockpile:

- reduced potential for dust emissions from stockpile operations. This may include dust generated during the transfer of ore to the stockpile, dust from the static stockpile and dust from the transfer of ore to the ship loader. Sealing of the shed and dust management systems will be important factors in determining the overall effectiveness of this option;

- reduced noise from stockpiling and transfer to the shiploader due to containment effects of the shed. Construction materials will however have a significant impact in determining the success of this measure in containing noise. Sound generation and reflected sound patterns would be altered by a shed, and these modified impacts need to be assessed;

- reduced use of water for stockpile damping;

- reduced use of electricity to pump water for dust suppression;

- reduced need for chemical crusting agents;

- reduced run-off containing iron ore dust; and

- reduced downtime due to adverse weather conditions.

Note, that none of the benefits quoted above have been quantified and hence it is not possible to say that even if adopted this measure would resolve the concerns of Esperance residents.

3.1.2 Potential Disadvantages of Enclosing the Stockpile

The visual impact of the project would be changed by the enclosure of the stockpile in a shed structure which would be considerably larger than the proposed
stockpile. The greater size being due to the additional height necessary for the roof to clear the stockpile and stacker. Screening vegetation will therefore need to be higher to be effective in reducing the visual impact of the structure. The time needed to achieve the extra height will also be longer.

Proposed dust suppression measures would have to be modified to address the potential impacts of leakage of dust from the structure and the sealing of doors and accessways.

3.1.3 Operations Not Affected by a Decision to Enclose the Stockpile

Previously reviewed impacts which will not be affected by a decision to enclose the stockpile include:

- railway operations; and
- shiploading.

3.2 EXTENDING THE RAIL LINE WITHIN THE PORT AUTHORITY BOUNDARY AND MOVING THE ROTARY CAR DUMPER

3.2.1 Potential Benefits

Extending the rail line onto the port breakwater would allow for the complete train to be contained within the port boundary during the unloading process.

This would have the benefit of:

- reducing delays at the Esplanade railway crossing;
- substantially reducing noise levels in the vicinity of the Esperance siding by eliminating that component of the noise which would have been generated by a requirement to split the train at this point;
- reducing the overall unloading time for the trains;
- increasing train speed through the southern part of Esperance, and thus reducing delays at the Pink Lake Road crossing; and
- halving the number of delays at the Pink Lake Road, and Esplanade railway crossings;
3.2.2 Potential Disadvantage

Increased exposure to prevailing wind on the breakwater would give rise to a greater risk of dust generation from the ore wagons and the rotary dumper which could subsequently affect the town and adjacent beaches.
4 FUTURE EXPANSION

Newspaper reports have quoted the miner, Portman Mining, as variously proposing an increase in the annual tonnage of ore exported to 2 and 3 million tonnes.

The CER has, however, been based around the export of the specified tonnage of 1.5 million tonnes per annum. If future expansion options, to 2 million tonnes or more, were under consideration by the Port Authority at the time of preparing the CER then the additional impacts of such an expansion should have been assessed.

Alternatively, in addition to stating the approved volume, i.e. 1.5 million tonnes, the conditions under which an expansion would be considered should have been detailed.

Potential impacts of expanding the volume of iron ore exported from 1.5 to 2 million tonnes include:

- one third more frequent (increase from 7.2 to 9.6 trains per week on average) or longer (65 wagons to 88 wagons) ore trains, or a combination of both;

- a one third increase in the number of shipping movements (45 to 55 per annum as opposed to 35 to 40) or larger tonnage ships (increase from 40,000 to 60,000 tonne vessels) or a combination of both. The larger tonnage vessels would require that the harbour be dredged;

- noise impact over a longer period each day, but not necessarily any louder at any given time;

- increased potential for dust due to extended loading and unloading time i.e. more frequent working of the stockpiles and increased ship loading.

- more frequent or longer delays for motorists and pedestrians at rail crossings.
5 CONCLUSIONS

While the CER identifies most of the potential impacts and undertakes to manage these it has not identified (quantified) the scale of the impacts in relation to their potential effects on the receiving environment. The report does not provide an assessment of the capability of the proposed management measures to meet the given commitments, where these have been stated, e.g. dust, or identify the impact levels for the unquantified commitments, e.g. noise.

No example of a similar project, operating with the low level of impact predicted in a previously non-industrially developed area, has been located to support the assessment put forward by the Port Authority.

The example of Port Kembla, quoted in the CER, which is recognised for its efforts in controlling the iron ore dust problem, differs considerably from the situation at Esperance in that a pre-existing industry is in the process of improving its environmental management, rather than being in the situation of protecting an unpolluted environment. At Port Kembla, although stockpile moisture levels are not a consideration, as iron ore is imported rather than exported, dust emissions still occur and adjacent residents advised the President of the Chamber during a site inspection that dust problems, although reduced from previous years, are still experienced (M. Cattle, pers. comm.). The nearest residents are located some 1.5 km from the stockpile area. At Esperance the stockpile would be located less than 100 m from the nearest residents. Thus, although the scale of the Esperance proposal is much smaller than other examples quoted, the proximity of adjacent development tends to reduce the benefits of the smaller scale of the operation.

In addition to dust, which is perceived as possibly the most significant impact of the proposal, due to its potential to alter the character of the town and because of its cumulative long-term effects, the extent of noise impacts associated with the various options still under consideration have the potential to adversely impact on residents and businesses in the vicinity of both the port and the railway, and therefore requires further evaluation.

It is therefore recommended that once the Port Authority has finalised its proposal, the impacts associated with this option be assessed and a further round of public consultations be held, to inform the community of the revised proposal and its impacts. The public should also be provided the opportunity to make further submissions.
6 RECOMMENDATIONS

6.1 ADDITIONAL INVESTIGATIONS PRIOR TO APPROVAL

It is recommended that the following investigations be undertaken, and commitments sought, prior to the approval of the project:

1 The responsibility for the management of rail impacts on centres between Koolyanobbing and Esperance needs to be clarified and the impacts of the project on these other areas assessed, either by the Port Authority or a separate proponent, as appropriate.

2 The benefits and disadvantages, both environmental and financial, of exporting through alternative port facilities at Kwinana to be more fully addressed by the Proponent.

3 The Shire of Esperance should review the adequacy of buffers between the port and adjacent residential development, with a view to minimising future conflicts between the port and non-compatible uses.

4 The adequacy of proposed stormwater containment measures needs to be reviewed.

5 The potential for the contamination (staining) of adjacent beaches as a result of iron contaminated groundwater leaching from the stockpile area or soakage pits should be reviewed.

6 Since it is unlikely that an operation comparable to that proposed at Esperance and in a similar environment could be put forward as a model by which to assess potential impacts at Esperance, it is recommended that a computer-based model integrating wind measurements for Esperance with studies of the various components of the project be assembled to test predictions of dust levels put forward.

7 The information provided by the model be used in determining a standard for airborne dust that will ensure the protection of the Esperance environment.

8 The suppliers of dust suppression equipment to the project be required to provide a contractual guarantee as to the level of dust suppression that can be achieved at Esperance, which should be not less than the maximum airborne dust level approved for the project.

9 In the absence of monitoring data from similar operations conducted elsewhere it is recommended that a model integrating the noise levels produced by each of the operations proposed with the topographic features
of Esperance be developed to assess the potential noise impacts and to evaluate alternative sound control measures.

Such models have the benefit of allowing alternative project designs to be assessed prior to construction and thereby allow for the minimisation of future management costs. The models should also be used to assist in the selection of equipment and management strategies to minimise the impact of the project, and in planning the location of facilities, in order to achieve the minimum impact, prior to construction taking place.

10 In the absence of conclusive data on dust emissions from rail wagons, and given the proximity of residences and businesses to the railway as it passes through Esperance, this impact should either be quantified and clearly demonstrated not to be a problem, by undertaking studies on existing operations elsewhere, or a commitment be given to prevent the generation of dust from this source, identifying the proposed dust control measures to be implemented.

11 A commitment be given to provide noise containment measures in the event that train noise levels are found to be unacceptable.

12 The Port Authority should review its internal road network with a view to removing the need to cross the rail line outside of the port area and thereby reduce the need for road trains to cross the Esplanade crossing.

13 The shire, in conjunction with Westrail and the Port Authority, undertake a review of road planning and crossing safety issues associated with the rail line.

14 Confirmation be provided by the Port Authority that the proposed stormwater storage pits are capable of meeting the commitment to contain all stormwater from the stockpiles.

15 The potential for the leaching of iron contaminated groundwater be investigated.

16 Confirmation be sought from SECWA on its ability to supply electricity to the project.

17 Confirmation be sought on the availability of tree species suitable for screening of the stockpile shed if it is constructed, with an estimate on how long it will take for the trees to form an effective screen.

18 That the Port Authority provide details of the dust management strategies proposed to contain dust emissions in the event that the option to enclose the stockpile is adopted.
19 That the potential for, and proposed management of, increased dust emissions from the rotary car dumper and ore wagons, both full and empty, be evaluated, should the proposal to relocate the dumper to a more exposed location near the breakwater be adopted.

20 The potential for, and limits to, the future expansion of the project should be identified.

6.2 FURTHER MONITORING IF THE PROJECT IS APPROVED

In addition to the monitoring programmes identified in the CER the following studies are recommended in the event that the project is approved:

1 An investigation of dust levels generated from open ore wagons and the need for ameliorative measures such as wash-down facilities on the outskirts of town and at the port, or covering of the wagons.

2 Monitoring of groundwater in the area between the stockpiles and the ocean to identify the presence of contamination by iron.

3 A baseline survey of marine organisms in the harbour, with an emphasis on potential exotic species, and the development of a management plan which provides for on-going monitoring and a contingency plan to be put into operation in the event that such organisms are detected.