Dampier Marine Services Facility
Noise Screening Assessment

301012/01121
27-Nov-09
EXECUTIVE SUMMARY

This report aims to undertake a “screening procedure” for determining whether the noise emissions from the DMSF proposal are likely to require more detailed analysis to ensure it conforms to the Environmental Protection (Noise) Regulations 1997.

The key construction activities relevant to noise generation are; seawall construction, dredging and reclamation, land-backed wharf construction, jetty construction, and access road construction.

To maintain the aspirational goals of Hearson Cove a cumulative level of 45dBA at the beach is recommended by the EPA.

Estimated worst case scenarios for noise during construction and operation are detailed below:

<table>
<thead>
<tr>
<th>Noise Receiving Premises</th>
<th>Distance from Source (m)</th>
<th>7am to 7pm Mon-Sat</th>
<th>Outside Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Noise Limit/Goal</td>
<td>Estimated Maximum</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mermaid Marine</td>
<td>1000</td>
<td>90 $^1$</td>
<td>65</td>
</tr>
<tr>
<td>Hearson Cove</td>
<td>5000</td>
<td>45 $^2$</td>
<td>51</td>
</tr>
<tr>
<td>Dampier</td>
<td>6000</td>
<td>65 $^1$</td>
<td>49</td>
</tr>
<tr>
<td>Operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mermaid Marine</td>
<td>1000</td>
<td>90 $^1$</td>
<td>56</td>
</tr>
<tr>
<td>Hearson Cove</td>
<td>5000</td>
<td>45 $^2$</td>
<td>42</td>
</tr>
<tr>
<td>Dampier</td>
<td>6000</td>
<td>65 $^1$</td>
<td>40</td>
</tr>
</tbody>
</table>

$^1$ LA max (Table 1), no influencing factor added. $^2$ EPA Aspirational Objective for Hearson Cove (guideline only)

Note: All noise limits and estimated maximums are in dB(A).
The proposal is not considered to be “particularly sensitive within the community” as defined within EPA Guidance Statement 8 (EPA 2007). Stakeholders concerns have been addressed within this document ant the API document, no specific issues were identified with the proposal by the parties consulted during DPA’s extensive stakeholder engagement.

The increase in traffic volumes associated with construction has been assessed in a detailed report (GHD 2009). The report predicts that under a worst case scenario, traffic volume on Mof Road would increase by 760vpd due to construction of the proposed DMSF and an additional 500vpd due to other projects on the Burrup Peninsula. A conservative assumption of a similar increase by 1,260vpd on the Karratha-Dampier Road would result in a future traffic volume of 11,021vd.

The proposal is expected to comply with the Environmental Protection (Noise) Regulations 1997 during both construction and operation. Noise levels are not predicted to exceed the maximum assigned noise level in the worst case during construction or operation, either for neighbouring industry sites or for the closest noise-sensitive receptor (the town of Dampier);

Noise levels at Hearson Cove may exceed the non-mandatory EPA Aspirational Objective of 45 dB(A) during piling operations, which will only be undertaken during the day and at certain times of the construction schedule. Noise emissions at Hearson Cove are not expected to exceed 45 dB(A) at other times;
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APPENDIX 2– RECEIVING NOISE PREMISES
APPENDIX 3– TRAFFIC ROUTES
1. INTRODUCTION

1.1 Purpose of this Report

Dampier Port Authority proposes to expand the existing Dampier Port facilities, creating a new Dampier Marine Services Facility (DMFS). This report aims to undertake a “screening procedure” for determining whether the noise emissions from the DMSF proposal are likely to require more detailed analysis to ensure it conforms to the Environmental Protection (Noise) Regulations 1997. It has been prepared in conjunction with the Assessment on Referral Information (WorleyParsons 2009).

1.2 Project Proponent

The proponent, Dampier Port Authority (DPA), is a state government owned corporation that operates under the Port Authorities Act 1999. Under this act DPA facilitates trade and commerce within and through the port, and maintains several wharf and berth areas, shipping channels and swing basins within the port.

Their office is located in Dampier, Western Australia:

Dampier Port Authority
MOF Road
Burrup Peninsula
DAMPIER 6713
Western Australia

The nominated proponent contact for this proposal is:

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Environment Manager
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Wayne.Young@dpa.wa.gov.au

Further information on Dampier Port Authority can be found at their website, www.dpa.wa.gov.au.
1.3 Scope

This report aims to undertake a “screening procedure” for determining whether the noise emissions from the DMSF proposal are likely to require more detailed analysis to ensure it conforms to the Environmental Protection (Noise) Regulations 1997.
2. PROJECT DESCRIPTION

2.1 Dampier Marine Services Facility Proposal

The Dampier Port Authority (DPA) currently owns and operates the Dampier Cargo Wharf (DCW).

The DCW facility will reach the end of its design life in 2021, and is currently experiencing elevated maintenance costs to maintain and operational state. The facility is also experiencing problems with capacity: current waiting time for ships accessing the DCW is between 8 and 14 days, and demand is predicted to increase. Further, associated laydown area in the Port is beyond capacity, leading to a congested and inefficient work area.

DPA proposes to expand the current facilities to create a Dampier Marine Services Facility (DMSF), as shown in Figure 1 below (also shown in Appendix 1). The proposed works will involve dredging, land reclamation, the construction of a new jetty and the construction of minor access tracks.

Figure 1: Proposed Dampier Marine Services Facility
2.2 Construction Schedule

The proposed schedule for construction of the DSMF is described below.

STAGE 1: SEAWALL, DREDGING AND RECLAMATION

- Seawall Construction: Q2 2010 to Q3 2011;
- Capital Dredging: Q3 2010 to Q3 2011;
- Reclamation: Q3 2010 to Q3 2011;
- Construction of Land Backed Wharf: Q2 2010 to Q3 2011;
- Construction of Laydown Area Civil and Drainage: Q2 2011 to Q1 2012;
- Construction of Access road – Civil and Drainage: Q2 2011 to Q1 2012;

STAGE 2: JETTY, ROLL-ON/ROLL-OFF AND LAYDOWN AREA

- Construction of 300m Jetty: Q4 2011 to Q4 2013;
- Construction of Buildings in Laydown Area: Q1 to Q4 2012;
- Construction of Roll-on / Roll-off Facility: Q4 2012 to Q3 2013

2.3 Relevant Activities

The key construction activities relevant to noise generation are:

- **Seawall construction**: using rock material (rock dumping) and sheet piles; Piling activities will only be undertaken during the day (between 7am and 7pm), within the following schedule:
  - Seawall Construction (Q2 2010 to Q3 2011);
  - Jetty Construction (Q4 2011 to Q4 2013); and
  - Construction of Roll-on / Roll-off Facility (Q4 2012 to Q3 2013).
Dredging and reclamation: 2.2 million m$^3$ sediment material will be dredged using a cutter suction dredge and pumped into a reclamation area contained within the seawall;

Land-backed wharf construction: the reclamation area surface will be compacted, cut to level and sealed with concrete; construction will require graders, rollers, excavators, loaders, road vehicles and water trucks;

Jetty construction: foundations will be piled, and sliding steel ramps will be progressively laid out to support the piling rig as installation moves away from the land-backed wharf. Cranes and excavators will be required for this work, and concrete will be progressively laid behind the piling operations;

Access road construction: trucks, rollers, graders and other road-grade vehicles will be used to cut and level the access road, followed by asphalt tipping and chip seal.

The operational DMSF will serve as a loading and offloading facility for major industry in the Pilbara.

Typical activities will include the docking, loading and unloading and refuelling of vessels up to 65,000 DWT, rail cars, semi-trailers and trucks. Loading and unloading activities may include the use of large excavators, articulated trucks, semi-trailers and crawler cranes.
3. LEGISLATION, GUIDELINES AND STANDARDS

The following legislation, guidelines and standards apply to construction and operation noise in Western Australia.

3.1 Environmental Protection (Noise) Regulations 1997

The WA Environmental Protection (Noise) Regulations 1997 were gazetted on 31 October 1997. The regulations specify maximum noise limits (“assigned levels”) according to the type of premises receiving the noise. The regulations also specify requirements relating to tonality, modulation and impulsiveness, and to emissions that may “significantly contribute” to an exceedance.

3.1.1 Special Provision for Construction Work

The regulations make special provision for construction work on construction sites (regulation 13). The assigned noise levels (Table 1) do not apply to noise emitted from a construction site as a result of construction work between 7am and 7pm on Mondays to Saturdays, under certain conditions.

3.1.2 Assigned Noise Levels

The Environmental Protection (Noise) Regulations 1997 provide limits for maximum noise levels (“assigned levels”), which are the highest noise levels that can be received by noise sensitive premises, commercial premises and industrial and utility premises. For noise sensitive residences, the time of day also affects the assigned levels.

The regulations define three types of assigned noise level:

- LA max assigned noise level means a noise level which is not to be exceeded at any time;
- LA 1 assigned noise level which is not to be exceeded for more than 1% of the time;
- LA 10 assigned noise level which is not to be exceeded for more than 10% of the time.

For noise sensitive premises, an “influencing factor” is incorporated into the assigned noise levels. The “influencing factor” takes into account the amount of industrial and commercial land and the presence of major roads within a 450m radius around the noise receiver. The influencing factor will range from zero to about 20 in most cases.

The assigned noise levels are presented in Table 1.
Table 1: Assigned noise levels in dB(A)

<table>
<thead>
<tr>
<th>Type of premises receiving noise</th>
<th>Time of day</th>
<th>Assigned Level dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LA 10</td>
</tr>
<tr>
<td>Noise sensitive premises 1</td>
<td>0700 to 1900 hours Monday to Saturday</td>
<td>45 2</td>
</tr>
<tr>
<td></td>
<td>0900 to 1900 hours Sundays and public holidays</td>
<td>40 2</td>
</tr>
<tr>
<td></td>
<td>1900 to 2200 hours all days</td>
<td>40 2</td>
</tr>
<tr>
<td></td>
<td>22 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays</td>
<td>35 2</td>
</tr>
<tr>
<td>Noise sensitive premises 1</td>
<td>All hours</td>
<td>60</td>
</tr>
<tr>
<td>Commercial premises</td>
<td>All hours</td>
<td>60</td>
</tr>
<tr>
<td>Industrial and utility premises</td>
<td>All hours</td>
<td>85</td>
</tr>
</tbody>
</table>

1 At locations further than 15 metres from a building directly associated with a noise sensitive use

2 Add influencing factor

Noise levels are subject to adjustments if the noise is considered to be intrusive or dominating. Intrusive or dominating noise characteristics include tonality, modulation and/or impulsiveness, and penalty adjustments are cumulative to a maximum of 15 dB. The relevant adjustments for noise that is not music are presented in Table 2.

Table 2: Adjustments for intrusive or dominant noise characteristics

<table>
<thead>
<tr>
<th>Where tonality is present</th>
<th>Where modulation is present</th>
<th>Where impulsiveness is present</th>
</tr>
</thead>
<tbody>
<tr>
<td>+5 dB</td>
<td>+5 dB</td>
<td>+10 dB</td>
</tr>
</tbody>
</table>

3.2 EPA Guidance Statements and Objectives

3.2.1 Environmental Objective for Noise

To protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring the noise levels meet statutory requirements and acceptable standards.
3.2.2 Aspirational Goal for Hearson Cove

The Environmental Protection (Noise) Regulations 1997 do not apply to Hearson Cove. However, EPA Bulletin 1077 regarding the Methanol Complex on the Burrup Peninsula stated that:

“The principle of “all reasonable and practicable measures” under the Environmental Protection Act 1986 requires proponents to get impacts down as low as reasonably practicable within the definition in the Act. A cumulative level of 45dBA at the beach is recommended by the EPA as an aspirational goal to help maintain the amenity at Hearson Cove. While this aspirational goal is not mandatory, it provides some guidance on a target for all proponents to strive to achieve.” (EPA 2002)

3.2.3 Draft Guidance Statement No 8

Draft GS8 (EPA 2007) provides guidance to proponents submitting proposals of projects producing environmental noise for environmental impact assessment. The guidance material covers EPA policy on a range of types of proposals that may emit noise, and guidance on the assessment of noise.

3.2.4 Guidance Statement No 3

EPA Guidance Statement No 3 (GS3) sets separation distances between industrial and sensitive land uses, based on potential impacts from gas, noise, dust, odour and risk.

Separation distances between Port sites and sensitive land uses, where operation involves the loading and unloading of bulk material onto vessels, are decided on a case by case basis according to EPA Guidance Statement No 3 (EPA 2004).

Industry involving the bulk material loading or unloading from vessels, where the material consists of clinker, coal, ore, ore concentrate or any other bulk granular material, requires a separation distance of 1000-2000 metres between the industry and sensitive receptors (EPA 2004).

3.3 WAPC State Planning Policy for Transport Noise

The Western Australian Planning Commission (2009a) State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning addresses transport noise from within major transport corridors, including primary freight routes and its impact on nearby noise-sensitive land uses. The Implementation Guidelines provide guidance on the application of the Policy (WAPC 2009b).
3.4 Australian Standard for Noise Control AS 2436:1981

Standards Australia (1981) provides guidance on noise control in construction, maintenance and demolition sites as it affects persons working on these sites and also those living and working in the neighbourhood. The standard includes guidance in investigation and identification of noise sources, measurements of sound and guidance in assessment with a view to planning measures for noise control and monitoring of their effectiveness.

AS 2436-1981 (Standards Australia 1981) provides a method for estimating cumulative emissions from several sources and provides an equation (1) for estimating sound level $L_{P(A)}$ at a given distance $R$ metres from a source emitting a sound $L_{W(A)}$:

$$L_{P(A)} = L_{W(A)} - 20 \log_{10} R - 8$$

The equation (1) assumes that the receiving position is at a distance $R$ from the geometric centre of a machine or process if sound is radiated uniformly in all directions over flat, open ground. The equation is an estimate only, and does not consider the effect of barriers or sound reflection, wind, air turbulence, temperature inversion effects, ground attenuation or any other allowances.
4. EXISTING ENVIRONMENT

4.1 Noise Receiving Premises

The project site is located within the Burrup Industrial Estate, on the western side of the Burrup Peninsula. A detailed site map is provided in Appendix 2, showing the location of the proposed DMSF and all potential noise receiving premises.

The closest noise sensitive site is the town of Dampier, located approximately 6 km south of the site. There are no other noise sensitive premises within 10 km.

Hearson Cove (a swimming and recreation beach; see Section 3.2.2) is located 5 km east of the site.

Industrial premises within 10 km of the site are:

- Mermaid Marine (1 km south)
- Woodside Pluto LNG gas plant (2 km north east)
- Burrup Fertilisers (3 km south east)
- Hamersley Iron (two facilities; 4 km south west and 8.5 km south west)
- Rio Tinto Dampier Salt Loadout Facility (10 km south west)

4.2 Ambient Noise Levels

Woodside Petroleum Limited (WPL 2006) undertook background noise monitoring at Hearson Cove and at the town of Dampier (Table 3). Typical activities related to sound pressure levels are provided in Table 4 for the purposes of comparison.

The monitoring indicated that ambient noise levels at Hearson Cove were dominated by recreational users on the beach in the evening between approximately 6pm-10pm, and that background levels were very low at other times. Noise levels at Dampier were found to be influenced by local traffic and activities at Pilbara Iron’s Dampier Port operations.
Table 3: Ambient noise levels at Dampier and Hearson Cove (WPL 2006)

<table>
<thead>
<tr>
<th>Location</th>
<th>L90(^1) of LA90 Noise Levels period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day (7am-7pm)</td>
</tr>
<tr>
<td>Hearson Cove</td>
<td>24</td>
</tr>
<tr>
<td>Dampier</td>
<td>37</td>
</tr>
</tbody>
</table>

\(^1\) LA90 is the level of noise exceeded for 90% of the time based on noise level monitoring at 15 minute intervals. The 90\(^{th}\) percentiles of these readings (the L90 of LA90 values) are extracted to determine the underlying background noise, i.e. the LA90 level that is exceeded for 90% of the total monitoring period.

Typical sound pressure levels are provided as a comparison (Table 4).

Table 4: Typical sound pressure levels for comparison purposes (Alcan 2004)

<table>
<thead>
<tr>
<th>Sound Pressure Level (dB)</th>
<th>Typical Environment</th>
<th>Average Subjective Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>140</td>
<td>30m from jet aircraft</td>
<td>Intolerable</td>
</tr>
<tr>
<td>130</td>
<td>Pneumatic chipping and riveting (operator’s position)</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>Boiler shop (maximum levels)</td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>Chainsaw</td>
<td>Very noisy</td>
</tr>
<tr>
<td>100</td>
<td>Disco</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Heavy lorries at 6m</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>Kerbside of busy road</td>
<td>Noisy</td>
</tr>
<tr>
<td>70</td>
<td>Loud radio</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Restaurant</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Conversational speech at 1m</td>
<td>Quiet</td>
</tr>
<tr>
<td>40</td>
<td>Residential area at night</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Quiet bedroom at night</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Background in TV and recording studios</td>
<td>Very quiet</td>
</tr>
<tr>
<td>10</td>
<td>Threshold of hearing</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.3 Existing Traffic Volumes

Current traffic volumes for roads along the proposed traffic route (Appendix 3) have been assessed in a detailed report (GHD 2009) and are listed below:

- Mof Road: 1,453 vpd (1% heavy vehicles);
- Karratha-Dampier Road: 9,761 vpd (1.2% heavy vehicles);
- Madigan Road: 3,090 vpd (7.2% heavy vehicles);
- North West Coastal Highway: 1841 vpd (10.2% heavy vehicles); and
- Burrup Peninsula Road: 5,024 vpd (1.6% heavy vehicles),

4.4 Land Use Separation Distances

The nearest sensitive noise receptor is the town of Dampier located 6 km south of the site, which is well outside the separation distance for bulk material loading and unloading (Section 3.2.4).
5. COMMUNITY PERCEPTION OF THE PROPOSAL

EPA Guidance Statement 8 (EPA 2007) suggests that a detailed noise assessment should be undertaken if a proposal is deemed to be “particularly sensitive within the community”, even if the noise emissions are not expected to exceed the “assigned levels” (Section 3.1.2).

DPA have undertaken extensive consultation with community groups and industry in the region. Stakeholders included the Shire of Roebourne, Dampier Community Association, neighbouring industries, the Department of Planning, the Department for Environment and Conservation (DEC) and the Department of Water.

The Pilbara branch of the DEC, and the Dampier Community Association, indicated that DPA should address the impacts and management of noise during construction. However DEC noted that noise issues are unlikely to be significant given the location of the project.

Consultation with neighbouring industry and the Shire of Roebourne revealed some concerns with impacts upon traffic by the proposal. Predictions of changes to traffic volumes and safety issues have been addressed in a separate report (GHD 2009), and road upgrades will be undertaken where necessary as a result of this report. DPA will ensure that all neighbouring industry is informed of relevant traffic planning.

All other concerns that were raised during consultation (i.e. indigenous heritage) have been addressed in the Assessment on Referral Information document prepared by WorleyParsons and/or in separate consultant reports. No specific issues were identified with the proposal by the Department of State Development, the Coastal Communities Environmental Forum, the Department of Planning or the Pilbara Sea Country Initiative.

The proposal is therefore not considered to be “particularly sensitive within the community” as defined within EPA Guidance Statement 8 (EPA 2007).
6. SCREENING METHODOLOGY

The screening methodology used in this report is based upon the EPA Guidance Statement 8 on Environmental Noise (EPA 2007) and aims to address whether:

- The proposal is considered “particularly sensitive within the community”;
- Any noise-sensitive premises are within the buffer distances indicated in Guidance Statement No. 3 for this type of proposal;
- The proposal will comply with the *Environmental Protection (Noise) Regulations 1997*, i.e.:
  - Construction noise is likely to be above the relevant screening criterion; or
  - Operational noise is likely to be above the relevant screening criterion.
- There is any requirement for blasting during construction or operation;
- Transport noise during construction will be within acceptable levels as set by the Western Australian Planning Commission (2009a) *State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning*; or
- Any other premises with amenity and recreational importance will be impacted by noise emissions from the proposal during construction or operation.

The screening assessment also identifies management measures will be implemented in accordance with the *Environmental Protection (Noise) Regulations 1997* and AS 2436-1981 to ensure that noise emissions are as low as reasonably practicable.

7. POTENTIAL IMPACTS

7.1 Construction

7.1.1 Potential Construction Sound Power Level

The potential construction sound power levels emitted from the equipment used during the construction process have been identified by applying the equipment type and specification to AS 1436-1981 (Standards Australia 1981) or manufacturer specifications. The estimated output sound power level is outlined in Table 5 below.

Table 5: Estimated noise from construction equipment (including adjustments)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Sound Power Levels dB(A) at Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic Piling Hammer</td>
<td>132 (^{1,2})</td>
</tr>
<tr>
<td>Excavators</td>
<td>120</td>
</tr>
<tr>
<td>Loaders</td>
<td>120</td>
</tr>
<tr>
<td>Dozers</td>
<td>118</td>
</tr>
<tr>
<td>Articulated Trucks</td>
<td>120</td>
</tr>
<tr>
<td>Semi-Trailers</td>
<td>112</td>
</tr>
<tr>
<td>Crawler Cranes (up to 150T)</td>
<td>118</td>
</tr>
<tr>
<td>Graders (15-18T)</td>
<td>118</td>
</tr>
<tr>
<td>Rollers (15-18T)</td>
<td>&lt;110</td>
</tr>
<tr>
<td>35T Multi-Wheel Roller</td>
<td>117</td>
</tr>
<tr>
<td>25Kl Water Truck</td>
<td>105</td>
</tr>
</tbody>
</table>

\(^1\) Source: Watson and Hillhouse (2009), CG300 Hydraulic Hammer (20 T)

\(^2\) Includes an adjustment for impulsive noise (+10 dB)

Terrestrial noise emissions from the cutter suction dredge are expected to be less than or equal to the equipment listed above. The WA Environmental Protection (Noise) Regulations 1997 do not apply to dredging equipment.

Construction of the seawall will require the dumping of heavy rock material. Activities associated with rock dumping are expected to be less than or equal to the emissions estimated above. Rock
dumping may be undertaken during the day (between 7am and 7pm) and at night (between 7pm and 7am), on Sundays and on Public Holidays.

**DAY (7AM-7PM)**

Based on the method of estimating cumulative noise emissions described in AS 1436-1981, in the worst case (assuming all equipment is used simultaneously), cumulative noise emissions during daytime (including piling) could reach 133 dB(A) at the source.

**NIGHT (7PM-7AM), SUNNADAYS AND PUBLIC HOLIDAYS**

No piling will be undertaken on Sundays or Public Holidays. Piling activities will only be undertaken during the day (between 7am and 7pm).

The remainder of the equipment listed in Table 5 could be used during the day (between 7am and 7pm) or at night (between 7pm and 7am), on Sundays and on Public Holidays.

Therefore in the worst case (assuming all equipment except the hydraulic piling hammer is used simultaneously), cumulative noise emissions outside 7am and 7pm Monday to Saturday could reach 127 dB(A) at the source.

### 7.1.2 Estimated Maximum Noise Levels at Receiving Sites

The noise levels at receiving premises during construction were estimated using the equation in Section 3.4. Noise levels at the source were assumed to be the “worst case” as described above. A comparison between estimated maximum operation noise and noise limits or goals (the maximum allowable assigned noise levels in Section 3.1.2 and the EPA Aspirational Objective for Hearson Cove in Section 3.2.2) is presented in Table 6.

As discussed in Section 3.4, the predicted noise levels in Table 6 are an estimate and do not consider the effect of barriers or sound reflection, wind, air turbulence, temperature inversion effects, ground attenuation or any other allowances. They are included only for screening purposes and are not intended as a prediction of potential noise levels.
Table 6: Estimated worst case noise levels at receiving premises during construction

<table>
<thead>
<tr>
<th>Noise Receiving Premises</th>
<th>Distance from Source (m)</th>
<th>7am to 7pm Mon-Sat</th>
<th>Outside Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Noise Limit/Goal</td>
<td>Estimated Maximum</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mermaid Marine</td>
<td>1000</td>
<td>90 (^1)</td>
<td>65</td>
</tr>
<tr>
<td>Hearson Cove</td>
<td>5000</td>
<td>45 (^2)</td>
<td>51</td>
</tr>
<tr>
<td>Dampier</td>
<td>6000</td>
<td>65 (^1)</td>
<td>49</td>
</tr>
</tbody>
</table>

1 LA max (Table 1), no influencing factor added. 2 EPA Aspirational Objective for Hearson Cove (guideline only)

Note: All noise limits and estimated maximums are in dB(A).

7.1.3 Construction Traffic Noise

During construction, rock material will be sourced from one of four potential sites: the Woodside Pluto stockpile, BGC Quarry, Cemex Quarry or Mt Regal Quarry. The transport route to be used during construction and the location of all noise-receiving premises are shown in Appendix 3.

The increase in traffic volumes associated with construction has been assessed in a detailed report (GHD 2009). The report predicts that under a worst case scenario, traffic volume on Mof Road would increase by 760 vpd due to construction of the proposed DMSF and an additional 500 vpd due to other projects on the Burrup Peninsula. A conservative assumption of a similar increase by 1,260 vpd on the Karratha-Dampier Road would result in a future traffic volume of 11,021 vpd.

The Burrup Road intersection with the Karratha Dampier Road represents the shortest distance for the traffic route from the town of Dampier (approximately 1.5km). The Madigan Road intersection with the Karratha Dampier Road represents the shortest distance for the traffic route from the town of Karratha (approximately 1km).

Table A3.2 of the *Implementation Guidelines* (WAPC 2009b) shows that on rural roads of up to 110km/h and for traffic volumes of up to 15,000 vpd with 10% heavy vehicles, the day noise level at 300m from the carriageway would be 53dB(A), which is within the LA\(_{eq}(Day)\) limit of 55dB(A) specified in the Planning Policy (WAPC 2009a).

7.1.4 Summary of Predicted Construction Noise Impact

The proposal is expected to comply with the *Environmental Protection (Noise) Regulations 1997* during construction. Noise levels are not predicted to exceed the maximum assigned noise level in
the worst case, either for the closest noise-sensitive receptor (the town of Dampier) or the neighbouring industry sites.

Noise levels at Hearson Cove may exceed the non-mandatory EPA Aspirational Objective of 45 dB(A) during piling operations, which will only be undertaken during the day and at certain times of the construction schedule. Noise emissions at Hearson Cove are not expected to exceed 45 dB(A) at other times.

Traffic noise from the proposed DMSF is expected to have negligible impacts upon sensitive noise receiving premises in Dampier and Karratha.

7.2 Operation

7.2.1 Potential Operational Sound Power Level

Based on AS 1436-1981, predicted sound power levels for operational activities have been estimated in Table 7. The equipment in Table 7 may be used at during the day (between 7am and 7pm) and at night (between 7pm and 7am), on Sundays and on Public Holidays.

Port operations will require the movement of tugs and vessels of up to 65,000 DWT. Terrestrial noise emissions from these vessels are expected to be minimal.

Table 7: Predicted Noise Emissions from On-Site Equipment during Operation

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Typical Noise dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Excavators (up to 100T)</td>
<td>120</td>
</tr>
<tr>
<td>Large Loaders</td>
<td>120</td>
</tr>
<tr>
<td>Semi-Trailers</td>
<td>112</td>
</tr>
<tr>
<td>Crawler Cranes (up to 150T)</td>
<td>118</td>
</tr>
</tbody>
</table>

Based on Table 7 and using the method of estimating cumulative noise emissions described in AS 1436-1981, the worst case cumulative noise emissions are expected to reach 124 dB(A) at the source.

7.2.2 Estimated Maximum Noise Levels at Receiving Sites

The noise levels at receiving premises during operation were estimated using the equation in Section 3.4. Noise levels at the source were assumed to be the “worst case” as described above. A comparison between estimated maximum operation noise and noise limits or goals (the maximum
allowable assigned noise levels in Section 3.1.2 and the EPA Aspirational Objective for Hearson Cove in Section 3.2.2) is presented in Table 8.

As discussed in Section 3.4, the predicted noise levels in Table 8 are an estimate and do not consider the effect of barriers or sound reflection, wind, air turbulence, temperature inversion effects, ground attenuation or any other allowances. They are included only for screening purposes and are not intended as a prediction of operation noise levels.

### Table 8: Estimated worst case noise levels at receiving premises during operation

<table>
<thead>
<tr>
<th>Noise Receiving Premises</th>
<th>Distance from Source (m)</th>
<th>7am to 7pm Mon-Sat</th>
<th>Outside Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Noise Limit/Goal</td>
<td>Estimated Maximum</td>
</tr>
<tr>
<td>Mermaid Marine</td>
<td>1000</td>
<td>90(^1)</td>
<td>56</td>
</tr>
<tr>
<td>Hearson Cove</td>
<td>5000</td>
<td>45(^2)</td>
<td>42</td>
</tr>
<tr>
<td>Dampier</td>
<td>6000</td>
<td>65(^1)</td>
<td>40</td>
</tr>
</tbody>
</table>

\(^1\) LA max (Table 1), no influencing factor added. \(^2\) EPA Aspirational Objective for Hearson Cove (guideline only)

Note: All noise limits and estimated maximums are in dB(A).

#### 7.2.3 Operational Traffic Noise

No significant increase in traffic volumes is expected during operation.

#### 7.2.4 Summary of Predicted Operational Noise Impact

The proposal is expected to comply with the *Environmental Protection (Noise) Regulations 1997* during operation. Noise levels are not predicted to exceed the maximum assigned noise level in the worst case, either for neighbouring industry sites or for the closest noise-sensitive receptor (the town of Dampier).

Noise levels at Hearson Cove are not expected to exceed the non-mandatory EPA Aspirational Objective of 45 dB(A) during operation.
8. MANAGEMENT STRATEGIES

8.1 Daytime Construction

For construction work carried out between 7am and 7pm on any day which is not a Sunday or public holiday:

- The construction work must be carried out in accordance with control of noise practices set out in section six of Australian Standard 2436-1981 “Guide to Noise Control on Construction, Maintenance and Demolition Sites”;
- The equipment used for the construction work must be the quietest reasonably available; and
- The CEO\(^1\) may request that a noise management plan be submitted for the construction work at any time.

\(^1\) The CEO refers to the chief executive officer of the Department of Environmental Protection. As this power is delegated under these regulations to the chief executive officers of all local governments in the state, any references to the CEO also means the Town Clerk, Shire Clerk or City Manager of the local council, unless otherwise noted.

8.2 Construction out of Hours

For construction work done outside the hours shown above -

- The work must be carried out in accordance with section six of AS 2436-1981;
- The equipment used must be the quietest reasonably available;
- The proponent must advise all nearby occupants of the work to be done at least 24 hours before it commences;
- The proponent must show that it was reasonably necessary for the work to be done out of hours; and
- The proponent must submit to the CEO a noise management plan at least seven days before the work starts, and the plan must be approved by the CEO. The noise management plan must include details of -

- need for the work to be done out of hours
If the proponent failed to comply with these conditions, or with the approved noise management plan, the noise from the construction site would be treated the same as noise from any other premises and would need to meet the assigned levels.

8.3 Operation

Operational noise emissions are likely to be significantly lower than noise emissions during construction of the facility. Consequently there will be no adverse impacts at noise sensitive premises, or Hearson Cove. Noise impacts at adjacent industrial premises will also be lower than during the construction of the facility and should be able to comply with the assigned noise levels of the Environmental Protection (Noise) Regulations 1997. However, the levels of received noise will depend both on the equipment noise levels and locations within the site. Port operation is 24 hours aday which is very important to its logistical purpose.

Best practice management strategies will be implemented during operation, particularly activities that may be considered noisy (Table 4).
9. CONCLUSIONS

The conclusions of the noise assessment are:

- The proposal is not considered to be “particularly sensitive within the community” as defined within EPA Guidance Statement 8 (EPA 2007);

- The proposal is expected to comply with the *Environmental Protection (Noise) Regulations 1997* during both construction and operation. Noise levels are not predicted to exceed the maximum assigned noise level in the worst case during construction or operation, either for neighbouring industry sites or for the closest noise-sensitive receptor (the town of Dampier);

- Noise levels at Hearson Cove may exceed the non-mandatory EPA Aspirational Objective of 45 dB(A) during piling operations, which will only be undertaken during the day and at certain times of the construction schedule. Noise emissions at Hearson Cove are not expected to exceed 45 dB(A) at other times;

- No blasting will be required;

- Traffic noise is expected to have negligible impacts upon noise receiving premises during both construction and operation of the proposed DMSF; and

- The separation distance between the site and the town of Dampier is well within the requirements of the EPA (2004) for bulk material loading and unloading.

Management measures will be implemented in accordance with the *Environmental Protection (Noise) Regulations 1997* and AS 2436-1981 to ensure that noise emissions are as low as reasonably practicable.
10. REFERENCES


Environmental Protection Authority (2002). Methanol Complex, Burrup Peninsula - Report and recommendations of the Environmental Protection Authority.


Western Australian Planning Commission (2009a). State Planning Policy 5.4 - Road and Rail Transport Noise and Freight Considerations in Land Use Planning.

Western Australian Planning Commission (2009b). State Planning Policy 5.4 - Road and Rail Transport Noise and Freight Considerations in Land Use Planning - Implementation Guidelines.


WorleyParsons (2009). Dampier Marine Services Facility - Assessment on Referral Information.
Appendix 1– Proposed Dampier Marine Services Facility
Appendix 2– Receiving Noise Premises
Appendix 3– Traffic Routes