ENVIRONMENTAL MANAGEMENT PLAN (EMP)

DRILLING ACTIVITY

PSC TL-OT-17-08

APPENDIX G - NOISE MANAGEMENT PLAN

TR-HSE-PLN-00-000-012
REVISION HISTORY

<table>
<thead>
<tr>
<th>REVISION</th>
<th>DATE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rev 0</td>
<td>10/3/20</td>
<td>Issued for use</td>
</tr>
<tr>
<td>Rev 00</td>
<td>24/9/20</td>
<td>Issued for internal review</td>
</tr>
<tr>
<td>Rev 1</td>
<td>29/12/20</td>
<td>Issued for use</td>
</tr>
</tbody>
</table>

MANAGEMENT APPROVAL

<table>
<thead>
<tr>
<th>POSITION TITLE</th>
<th>NAME</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Executive Officer</td>
<td>Suellen Osborne</td>
<td>[Signature]</td>
<td>29/12/20</td>
</tr>
<tr>
<td>GM Exploration</td>
<td>Jan Hulse</td>
<td>[Signature]</td>
<td>29/12/20</td>
</tr>
</tbody>
</table>

DISTRIBUTION LIST

<table>
<thead>
<tr>
<th>AUTHORITY/COMPANY’S NAME</th>
<th>DATE</th>
<th>REVISION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autoridade Nacional do Petroleo e Minerais</td>
<td>29/12/20</td>
<td>Rev 1</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS

TABLE OF CONTENTS...........................................................................................................3
APPENDICES.........................................................................................................................3
FIGURES...............................................................................................................................3
ACRONYMS ............................................................................................................................4
1 INTRODUCTION .................................................................................................................5
  1.1 CONTEXT .......................................................................................................................5
  1.2 PURPOSE ......................................................................................................................5
  1.3 SCOPE ..........................................................................................................................5
  1.4 LEGAL REQUIREMENTS ..............................................................................................5
2 POTENTIAL NOISE IMPACTS .............................................................................................8
3 MANAGEMENT OF IMPACT ..............................................................................................9
4 MONITORING .....................................................................................................................10
5 RESPONSIBILITIES ..........................................................................................................10
  5.1 TIMOR RESOURCES ......................................................................................................10
  5.2 CONTRACTORS .............................................................................................................11

APPENDICES

APPENDIX 1 - SENSITIVE RECEPTEORS IDENTIFIED IN THE EIA...........................................12
APPENDIX 2 - NOISE SURVEY FORM ....................................................................................14

FIGURES

FIGURE 1 - ATTENUATION RATE OF SOUND LEVEL IN AIR ....................................................7

TABLES

TABLE 1 - NOISE LEVEL GUIDELINES ...................................................................................6
TABLE 2 - TYPICAL NOISE LEVELS Emitted BY RIG EQUIPMENT .........................................6
ACRONYMS

EIA    Environmental Impact Assessment
EMP    Environmental Management Plan
HSE    Health Safety Environment
IFC    International Finance Corporation
TR     Timor Resources
WHO    World Health Organisation
1 INTRODUCTION

1.1 CONTEXT

Timor Resources Pty Ltd (TR) acquired onshore PSC No.: TL-OT-17-08 in Suai Municipality on 7 April 2017. The licence covers 1445.2 km², comprising 1,057.8 km² onshore and 387.4 km² in the near offshore to an average distance of 7km from the coastline, which is 64km long, and up to 34.5 km inland.

1.2 PURPOSE

This project was determined to require a Category A Licence under Decree Law No. 5/2011.

The TR Noise Management Plan fulfills a requirement under the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP). The EIA identified potential impacts from the project and various plans have been developed to supplement the EIS and EMP. The Plan presented here details monitoring activities and actions aimed to measure and mitigate potential noise impacts from operational activities, as well as assigning responsibilities to ensure the Plan is implemented.

This document is an appendix to the EMP – Appendix G.

1.3 SCOPE

Noise levels during construction and decommissioning phase may have a short-term effect but will be low level and transient. In contrast, the noise levels during the drilling phase may pose a problem if disturbance is caused to wildlife or human inhabitants close to the facility. A key priority will be the implementation of noise control measures at each source point (see Appendix 1). The selected methods will depend on the source type and the proximity of sensitive receptors, and can include, but not limited to, equipment selection, acoustic enclosures, cladding, traffic route selection, etc.

This document will address noise monitoring for the PSC: TL-OT-17-08 drilling programme.

1.4 LEGAL REQUIREMENTS

Timor-Leste does not have specific guidelines for the control and management of noise, therefore, this plan will refer to the International Finance Corporation (IFC) Environmental, Health and Safety General Guidelines, and in the case of noise are based on World Health Organisation (WHO) guidelines as shown in Table 1.
Table 1 - Noise Level Guidelines
(Source: WHO Guidelines for Community Noise - Berglund et al. 1999)

<table>
<thead>
<tr>
<th>RECEPTOR</th>
<th>DAYTIME 07:00 - 22:00</th>
<th>NIGHT TIME 22:00 - 07:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential; institutional; educational</td>
<td>55</td>
<td>45</td>
</tr>
<tr>
<td>Industrial; commercial</td>
<td>70</td>
<td>70</td>
</tr>
</tbody>
</table>

The typical sound levels for rig components and locations are given in Table 2. The actual sound levels during the operation will be subject to the type of activity being conducted (e.g. drilling, tripping, circulating).

Table 2 - Typical Noise Levels Emitted by Rig Equipment
(from (Radtke, 2016\(^1\)), (Abadi et al, 2015\(^2\)) & (SLR Consulting, 2011\(^3\))

<table>
<thead>
<tr>
<th>SOUND LEVEL (DBA)</th>
<th>TYPICAL SOURCE</th>
<th>SUBJECTIVE EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>N/A</td>
<td>Intolerable without PPE</td>
</tr>
<tr>
<td>100-120</td>
<td>Engine Generators, Desander / Desilter</td>
<td>Extremely Noisy</td>
</tr>
<tr>
<td>80-100</td>
<td>Mud Pumps, Compressors, Shakers</td>
<td>Very Noisy</td>
</tr>
<tr>
<td>60-80</td>
<td>Rig noise in camp offices</td>
<td>Loud</td>
</tr>
<tr>
<td>40-60</td>
<td>Rig Noise at site perimeter</td>
<td>Moderate to Loud</td>
</tr>
<tr>
<td>30-40</td>
<td>Rig Noise 350m from Source</td>
<td>Quiet</td>
</tr>
<tr>
<td>20-30</td>
<td>Rig Shut down, background</td>
<td>Almost Silent – Very Quiet</td>
</tr>
</tbody>
</table>

---

The percentage drop in sound level with distance from source may be calculated using Free Field Inverse Square Law. Using $dB_2 = dB_1 + 10 \ln(d_1/d_2)$ where $dB_2$ is the sound level at a given point at a distance of $d_2$ from the sound level $dB_1$ at a distance of $d_1$ from the source, see Figure 1.

![Sound Attenuation](image)

**Figure 1 - Attenuation Rate of Sound Level in Air**

The recommended noise limits for the project are based on the existing noise levels in the area and, for noise sensitive premises such as a dwelling, ranging from 55 to 62 db (A) during daylight hours to 45 to 52 db (A) during the night period (from 2200 hrs). Commercial premises (75db (A)) and industrial premises (80dB(A)) always have higher limits due to their lower sensitivity. The limit for this project is set at 80dB(A) for daytime work in non-residential areas.
2 POTENTIAL NOISE IMPACTS

Noise can become an environmental nuisance when it negatively affects environmental values, including human health and wellbeing. A negative impact can include disturbance to sleep or recreational activities, impacts on the health and biodiversity of ecosystems, and reduced community amenity. Factors leading to potential noise emissions associated with this project are:

- The use of heavy vehicles during camp construction and vegetation clearing.
- Accommodation camp (e.g. vehicle use to and from the camp at peak times, personnel activity, use of generators, construction and decommissioning).
- Increase in light vehicle movements to and from site/camp, particularly at the start and end of daily shift.

Excessive noise may lead to the following impacts:

- Disturbance to sensitive receptors (e.g. residential areas, breeding/nesting fauna).
- Degradation of public utilities.

During the construction phase of the proposed project, there is expected to be an increase in the noise levels within the area due to machinery and equipment including generators, vehicular traffic, and other construction activities. These may contribute to noise levels above the background within the site and along the roads to the site.

Drilling operations produce limited noise from drilling machinery and vehicular movement.

Most of the well sites are sparsely populated with limited infrastructure in place, resulting in less potential noise impact. In areas where residential receptors are more frequent and/or identified fauna exist, the localised and temporal nature of this project will ensure noise emissions impacts are limited. The following provides a summary from the EIA of the environment at each well location taken:

**Karau-1**: The area within 350m of the well site is sparsely populated, the Suai Prison lies 151m to the west of the perimeter fence, where noise levels may be expected to be in the region of 40db, however this is within the IFC guidelines for night-time.

**Kumbili-1**: No infrastructure exists within 350m of the location so disturbance impacts will be minimal.

**Lafaek-1**: no infrastructure is present within 350m of the location apart from the Suai Expressway.

**Laisapi-1**: approximately 1km from the township of Kuluan, but with no existing infrastructure within 350m.
Raiketan-1: several dwellings are situated within the 350m radius of the location. If these are impacted by noise, then temporary noise barriers may be required, or the occupants may be relocated temporarily during operations.

Haemanu Camp: The noise levels from the camp will be low, the main contributions being from heavy vehicle movement (daylight hours only) and a small generator to provide camp power if the EDTL supply is interrupted.

3 MANAGEMENT OF IMPACT
The noise impacts will be mitigated throughout the project phases by implementing the following mitigation strategies:

Construction
- Restrict construction activities to normal working hours 0800hrs to 1700hrs
- Inform local residents beforehand, via notices and advisories, of pending noisy periods and solicit their tolerance well before the commencement of demolition works.
- Machinery should be maintained regularly to reduce noise resulting from friction during operations.
- Drivers to adhere to speed limits within the project site access roads and vicinity
- A grievance procedure will be established whereby noise complaints by neighbours are recorded and responded to.
- Restrict hooting of vehicular horns.
- Locate all stationary construction equipment (i.e., compressors and generators) as far as practicable from any nearby sensitive receptors.
- Shielding the area to reduce noise propagation at Raiketan as necessary.

Operations
- Machinery should be maintained regularly to reduce noise resulting from friction during operations.
- A grievance procedure will be established whereby noise complaints by neighbours are recorded and responded to.
- Muffle and maintain all equipment used.
- Using modern machinery equipment with noise suppressing technologies in order to reduce the noise-rating as much as possible.
Decommissioning

- Restrict decommissioning activities to normal working hours 0800hrs to 1700hrs.
- Inform local residents beforehand, via notices and advisories, of pending noisy periods and solicit their tolerance well before the commencement of demolition works.
- Machinery should be maintained regularly to reduce noise resulting from friction during operations.
- Drivers to adhere to speed limits within the project site access roads and vicinity.
- A grievance procedure will be established whereby noise complaints by neighbours are recorded and responded to.
- Restrict hooting of vehicular horns.
- Locate all stationary equipment (i.e., compressors and generators) as far as practicable from any nearby sensitive receptors.
- Limit pick-up trucks and other small equipment to an idling time, observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible.
- Shielding the area to reduce noise propagation at Raiketan as necessary.

4 MONITORING

The Operations Manager will implement noise monitoring levels on a monthly basis at the rig and camp fence and at sensitive receptors recording the following (see Appendix 2 - Noise Survey Form):

- Date and time.
- Location.
- Equipment to be monitored as applicable.
- Proximity to the rig site, buildings, officer and nearby community.

5 RESPONSIBILITIES

5.1 Timor Resources

Timor Resources is to guarantee the availability of the economic, human and technical resources needed to manage the mitigation measures as described in this document. It is Timor Resources’ responsibility to:

- Ensure that the requirements of this Noise Management Plan are satisfied.
- Ensure that all contractors and sub-contractors are aware of their responsibilities to undertake their activities in accordance with this Plan.
5.2 **CONTRACTORS**

- Understand their responsibilities as per this Plan, and ensure they have the capacity to carry out those responsibilities and that all personnel under their care are made aware of responsibilities and requirements.
- Recommend changes to this Plan if appropriate and in discussion with TR personnel.
- Ensure appropriate records are kept and maintained on-site.
- Verifying any specific training/awareness sessions to employees involved in operations that may impact on the noise environment.
Appendix 1 - Sensitive Receptors Identified in the EIA
### SENSITIVE LOCATIONS IN AND AROUND THE WELL SITES

<table>
<thead>
<tr>
<th>No</th>
<th>Locations</th>
<th>Distance</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Public road via Camenasa area to Karau and Kumbili Wells</td>
<td>1.3 km from Kumbili Well site</td>
<td>Movement of equipment to the wells site can increase noise.</td>
</tr>
<tr>
<td>2</td>
<td>The closet settlements in Karau area</td>
<td>0.9km from the well site</td>
<td>Well activity</td>
</tr>
<tr>
<td>3</td>
<td>The closet settlement (MDG House) in Kumbili site</td>
<td>1 km from the well site</td>
<td>Well activity</td>
</tr>
<tr>
<td></td>
<td>The closet school (Eskola Basicu Sanfuk)</td>
<td>1.8 km from the well site</td>
<td>Well activity</td>
</tr>
<tr>
<td>4</td>
<td>The closet settlement to Laisapi well (Kulu oan)</td>
<td>0.9 km from the well site</td>
<td>Well activity</td>
</tr>
<tr>
<td></td>
<td>The closet school (Eskola Basicu Raimea)</td>
<td>3 km from the well site</td>
<td>Well Activity</td>
</tr>
<tr>
<td>5</td>
<td>The closet settlements Hasain and MDG house Hasain) in Raiketan Well</td>
<td>1.2 km and 2.5 km from the well site</td>
<td>Well activity</td>
</tr>
<tr>
<td>6</td>
<td>The closet school (Eskola Basicu Holbelis) in Lafaek Well</td>
<td>0.7 km from the well site</td>
<td>Well activity</td>
</tr>
</tbody>
</table>

### MAX DISTANCE FROM WELL SITE TO SENSITIVE LOCATORS

<table>
<thead>
<tr>
<th>Wellsite</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karau</td>
<td>1.8 km</td>
</tr>
<tr>
<td>Kumbili</td>
<td>1.0 km</td>
</tr>
<tr>
<td>Lafaek</td>
<td>0.7 km</td>
</tr>
<tr>
<td>Laisapi</td>
<td>3.0 km</td>
</tr>
<tr>
<td>Raiketan</td>
<td>2.5 km</td>
</tr>
</tbody>
</table>
Appendix 2 - Noise Survey Form
## Noise Survey Form

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Date &amp; Time of Noise Level Test</th>
<th>Specific Location of Equipment to be Tested</th>
<th>Equipment to be Tested</th>
<th>Proximity in Meters to nearest Rig work area/ Workshop/ Store/ Building/ Office/ sleepers etc.</th>
<th>1st test Noise Level Reading - to be taken 10 meter from source of noise</th>
<th>2nd test Noise Level Reading - to be taken 20 meter from source of noise</th>
<th>3rd test Noise Level Reading - to be taken 30 meter from source of noise</th>
<th>Are any personnel exposed to a peak level dose &gt; 140dB for &gt; 15 minutes continuously</th>
<th>Are any personnel exposed to a peak level dose &gt; 80dB from a noise source</th>
<th>Are hearing protection required - what type - angu or double &amp; at what distance from the source</th>
<th>Are hearing protection warning signs displayed in the area of the noise source</th>
<th>Additional Precautions i.e. consider job rotation to reduce exposure time to the noise source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>