ENVIRONMENTAL MANAGEMENT PLAN (EMP)

DRILLING ACTIVITY

PSC TL-OT-17-08

APPENDIX G - NOISE MANAGEMENT PLAN

TR-HSE-PLN-00-000-012

REVISION HISTORY

REVISION	DATE	DESCRIPTION
Rev 0	10/3/20	Issued for use
Rev 00	24/9/20	Issued for internal review
Rev 1	29/12/20	Issued for use

MANAGEMENT APPROVAL

POSITION TITLE	NAME	SIGNATURE	DATE
Chief Executive Officer	Suellen Osborne		29/12/20
GM Exploration	Jan Hulse		29/12/20

DISTRUBUTION LIST

AUTHORITY/COMPANY'S NAME	DATE	REVISION
Autoridade Nacional do Petroelo e Minerais	29/12/20	Rev 1

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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 km^2, comprising 1,057.8 km^2 onshore and 387.4 km^2 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 fulfils 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)

NOISE LEVEL GUIDELINES		
	ONE HOUR L_{Aeq} (dBA)	
RECEPTOR	DAYTIME 07:00 - 22:00	NIGHT TIME 22:00 - 07:00
Residential; institutional; educational	55	45
Industrial; commercial	70	70

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]))

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

[1] Radtke. (2016). Noise Characterization of Oil and Gas Operation, MSc thesis. Colorado State University.

[2] Abadi et al. (2015). Noise Exposure of Workers on a Land Oil Rig Floor,. Journal of Health Research.

[3] SLR Consulting. (2011). Santos Drill Rig 103, Glasserton 2,3 & 4 Drill Sites, Consideration of Noise Emission. Unpublished Report.

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.

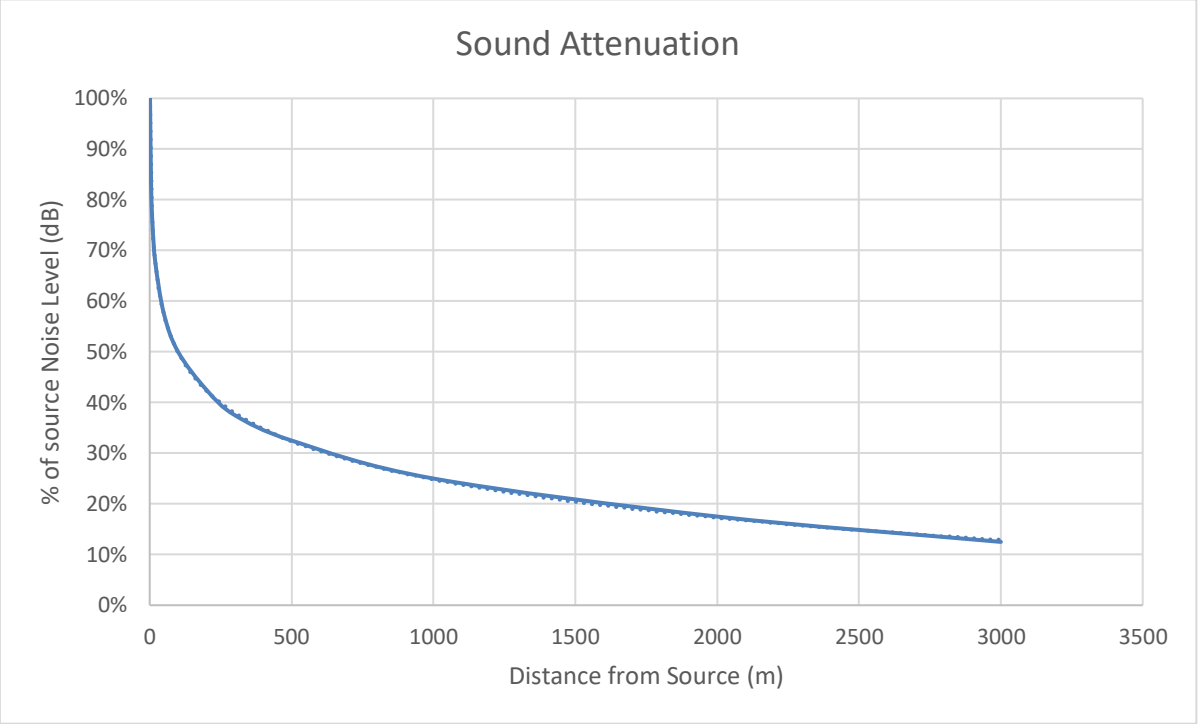

Figure 1 - Attenuation Rate of Sound Level in Air

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 to1700hrs
- 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 to1700hrs
- 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

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

MAX DISTANCE FROM WELL SITE TO SENSITIVE LOCATORS

Wellsite	Distance
Karau	1.8 km
Kumbili	1.0 km
Lafaek	0.7 km
Laisapi	3.0 km
Raiketan	2.5 km

Appendix 2 - Noise Survey Form

NOISE SURVEY FORM

Location:

Rig No.: ____________________

Weather Condition: Rain Dry Windy No Wind Low Cloud

Person Conducting the Test:

Noise Meter Type/model: ____________________

Rig No.:

Calibration Date: ____________________

Item No:	Date & Time of Noise Level Test	Specific Location of equipment to be tested	Equipment to be Tested	Proximity in Meters to nearest Rig work areas/ Workshop/ Store/ Building/ Office/ sleeper etc	1st test: Noise Level Reading - to be taken at the source of noise	2nd test: Noise Level Reading - taken 10 meter from source of noise	3rd test: Noise Level Reading - to be taken 20 meter from source of noise	Are any personnel continuously exposed to a 12 hour dose >83.2dB	Are any personnel exposed to a peak level dose > 140dB for >15 minutes continuously	Is hearing protection required - what type - single or double & at what distance from the source	Are hearing protection warning signs displayed in the area of the noise source	Additional Precautions i.e. consider job rotation to reduce exposure time to the noise source