



PTTEP International Limited (Yangon Branch), Yadana Asset

Six Monthly Environmental Monitoring Report (2023)

Yadana Asset, Block M5 M6

Yangon, Myanmar

February 2023

Environmental Monitoring Report for Yadana Asset Facilities

	<i>Prepared by:</i>	<i>Checked by:</i>	<i>Approved by:</i>
<i>Name</i>	Saw Hudson	Nyan Win Thu/Tun Win Tun	Myo Nyunt
<i>Function</i>	HSE/ENV	HSE	TS
<i>Date</i>			09-Mar-2023
<i>Visa</i>	Saw Hudson <small>Digitally signed by Saw Hudson DN: cn=Saw Hudson, o=MM, ou=PTTF, email=Saw Hudson, c=MM Date: 2023.03.09 15:20:03 +06'30'</small>	Digitally signed by Tun Win Tun Date: 2023.03.09 15:20:03 +06'30'	

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1. Executive Summary

This report is developed in line with the Myanmar government's environmental regulation of EIA procedure 2015. It is written following the format of the approved environmental management plan (EMP) of existing Yadana facilities in September 2018. This 6-monthly monitoring report explains the monitoring programs of offshore, onshore, Thaketa Logistics base, and Yangon head office in detail. The environmental monitoring measures are based on the EMP of existing Yadana facilities.

The monitoring parameters like noise, produced sand, wastewater analysis, etc., for all facilities are also detailed in this report. The verification audits like ISO 14001 audits, the company's significant improvements in installing ambient air quality monitoring devices, and Purple Air are highlighted. During the reporting period, no non-compliance and no major accidents or incidents related to environment and safety occurred in Yadana assets.

2. Introduction

After the withdrawal of the previous operator, TotalEnergies Exploration and Production Myanmar (TEEPM), from the country on 20th July 2022, Yadana asset was officially transferred to PTTEP International Limited on 20th July 2022, and it was named PTTEP International Limited (Yangon branch). Two partner companies joined PTTEP International Limited (Yangon branch) in this project: UNOCAL (41.1016%), MOGE (21.8142%), and PTTEP hold (37.0842%) of its interest and are the operator of this joint venture until the end of July 2028.

The first six monthly environmental monitoring report after the transfer was submitted to ECD via MOGE in August 2022. This is the second monitoring report prepared based on the available information and data collected over six months. This six-monthly environmental monitoring report entails the monitoring activities onshore and offshore of Yadana assets during December 2021 and July 2022. The monitoring activities will cover offshore activities like produced sand analysis and onshore activities such as Noise, Storm water drainage of PLC/MS, Thaketa logistics base, and Yangon Head Office as in previous reports. All these aspects monitored complied with NEQG based on the Environmental Management report approved in September 2018. Contact details of the Project proponent is provided below;

Name: Saw HUDSON

Position: Environment Engineer

PTTEP International Limited, Yadana Asset

Email: saw.hudson@pttep.com

Address: No. 5, Sacred Tooth Relic Lake Avenue,

Punn Pin Gone Quarter No.5,

Mayangone Township, Yangon,

The Republic of the Union of Myanmar.

Phone: 95 (1) 650977, 650989, 660466 ext.3129

3. Monitoring Activities in Offshore and Onshore

3.1 Monitoring in Offshore

In this monitoring report, the monitoring measures of produced water highlighted that the produced water is not discharged on board as they are injected into the injection well. The amount of produced sand is almost not available because only sludge came out from the sand removal package currently. The laboratory analysis results are attached for the record as in below table and figure.

Environmental Aspects	Monitoring Parameters	Duration / Frequency of Monitoring	Location of Monitoring	Implementation	Date of Monitoring	Remark
1. Cuttings (Water-Based Mud, WBM)	Two infill wells were drilled in Yadana offshore in May 2021. The samples analysis results were already included in previous monitoring report submitted in Dec 2021. There is no drilling campaign organized between December 2021 and this reporting period.					
2. Produced water	Produced water is reinjected in the well. There is no produced water discharge in the sea directly.					
3. Produced sand	Required by NEQG <ul style="list-style-type: none">• OOC %	<ul style="list-style-type: none">• Analysis/monitoring as required (i.e., frequency depends on sand production volumes and intervals)	<ul style="list-style-type: none">• Processing Platform	Method <ul style="list-style-type: none">• Record produced sand volume.• Produced sand samples will be collected for analysis according to international guidelines and requirements such as USEPA.	Yadana Asset	There is a negligible volume of sludge collected monthly from sand removal package. As per below test result, there is no indication of sand observed in the test.



PTTEP Myanmar

Yadana (Off-Shore) Laboratory

To: Production Superintendent




From: Lab Technician





CC: OY/P Supervisor

Subject: Sludge Sample from Sand Removal Package

Date: January 24, 2023

The sludge sample from Sand Removal Package-A was received on 18/01/23. The sample was analyzed, and the test results are as shown below:

Sludge from sand removal Package-A		
Test	Photo	Comment
Original sample		Dark, oily smell, wet at room temperature
Dried sample		Oily smell and fine, light grey
With magnet		Very little of sample was attracted by magnet

<p>In the water at RT</p>		<p>Some sample was floated in water at RT and some sample was sunk at the bottom</p>
<p>In Toluene at RT</p>		<p>Solvent turned to turbid, and some sample was dissolved in Toluene solvent</p>
<p>After treatment with Toluene at RT and filtering and drying in the oven</p>		
<p>In HCl solution at RT</p>		<p>A lot of bubbles were observed.</p>



After treatment with HCl acid solution at RT and the residue after filtering and drying in the oven.		
--	---	--

The below table describes the amount of sludge sample:

Sample	Sludge sample from Sand removal package A
% Xylene Soluble in original sample	2.5
% Acid Soluble in original sample	35
% Residue in original sample	62.5

Conclusion: Based on the visual inspection there is no sand indication from fine particle results. Further detail analysis can't be carried out in PP Lab due to the limitation of facilities.

Test done by:
Cherry Thwin
PP Lab Chemist.

W:\YDN\DivisionData\Div-oy\08-Laboratory\30 Sand Removal package monitoring-17\2023\ Sand removal package solid sample-A 180123.docx

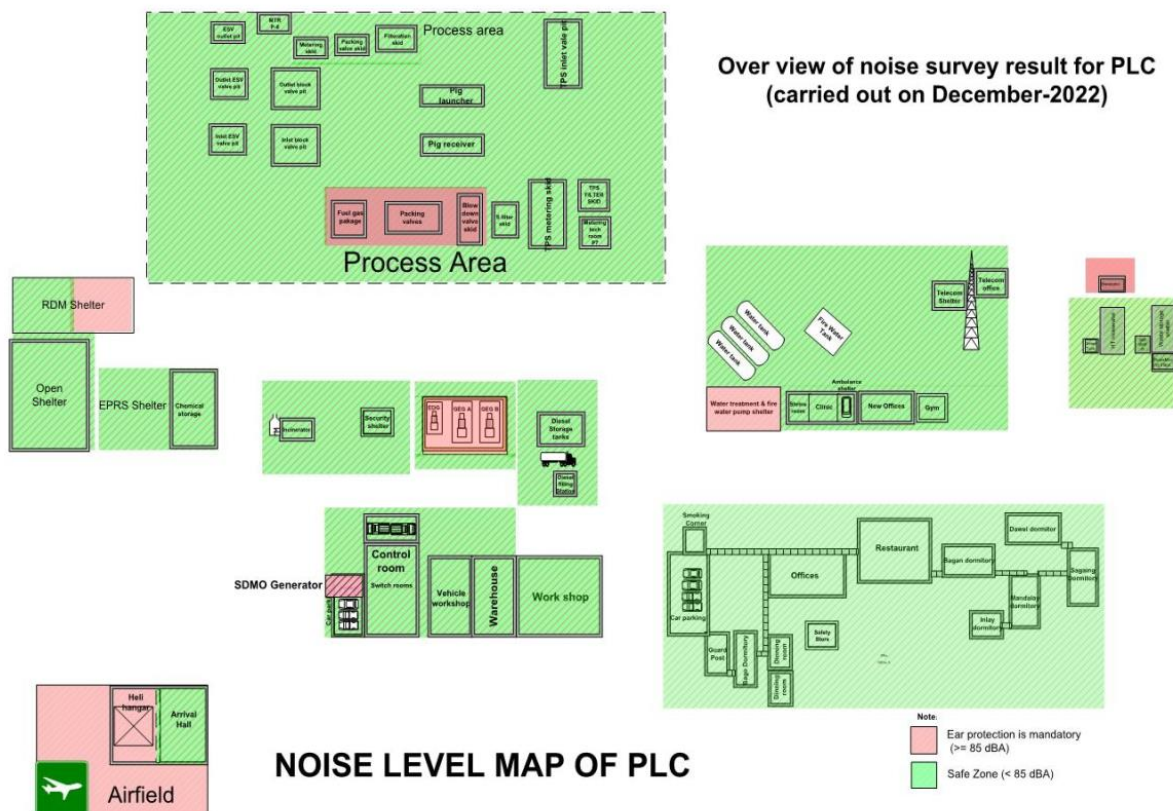
Figure 1: Produced Sand Laboratory Result

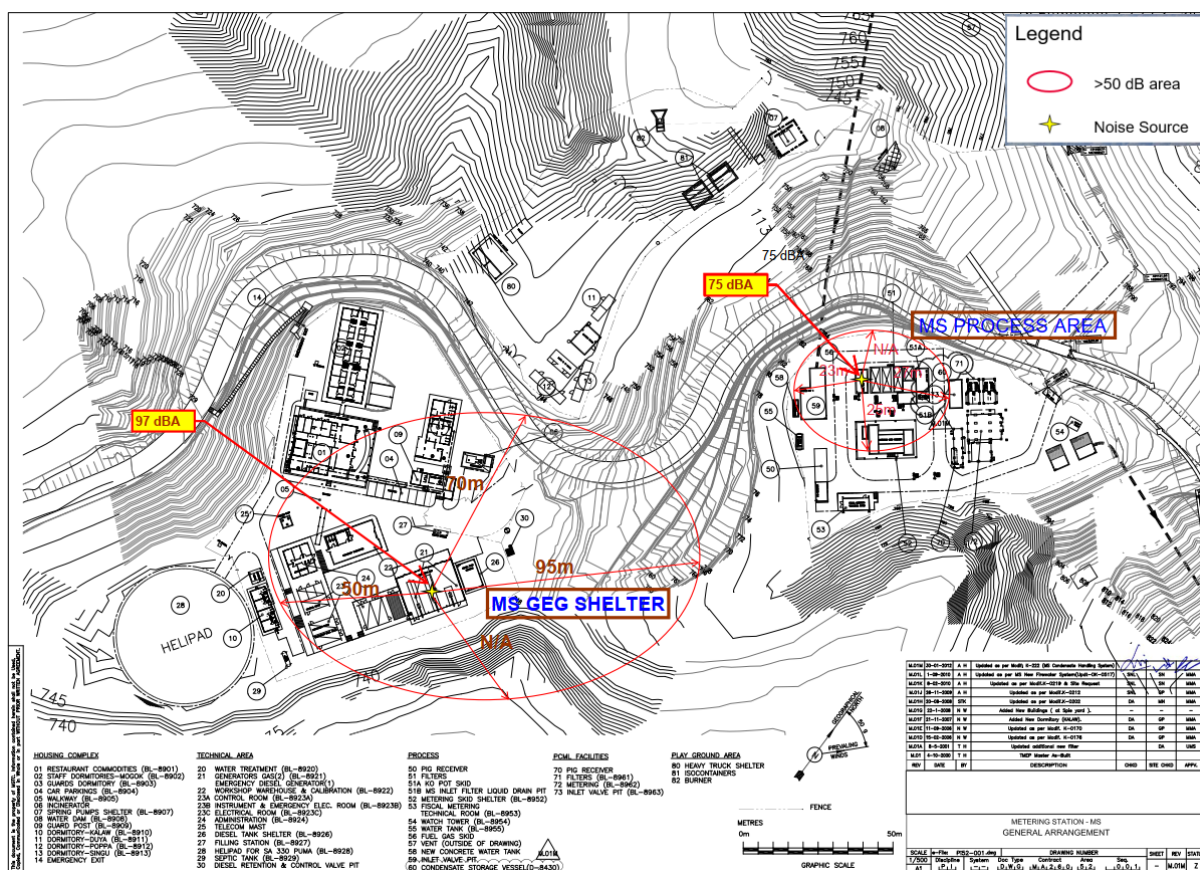
3.2 Monitoring in Onshore Facilities (including Thaketa Base)

Monitoring measures for onshore facilities such as Noise and stormwater drainage are regularly monitored as in below table.

Environmental Aspects	Monitoring Parameters	Duration/Frequency of Monitoring	Implementation	Monitoring Date	Remark
Noise	Required by NEQG <ul style="list-style-type: none"> One Hour LAeq (dBA) 	<ul style="list-style-type: none"> In event of or response to complaints 	<ul style="list-style-type: none"> Standard noise sampling methods. Compare results with data from nearest baseline station and NEQG 	TEEPM	See the noise maps
Storm Water Drainage	Required by NEQG <ul style="list-style-type: none"> Oil & Grease 	<ul style="list-style-type: none"> 6 Monthly In event of spillage or leakage In response to complaints 	<ul style="list-style-type: none"> Samples will be collected for analysis according to international guidelines and requirements such as USEPA. 	TEEPM	Attached the relevant records in fig 5 & 6.

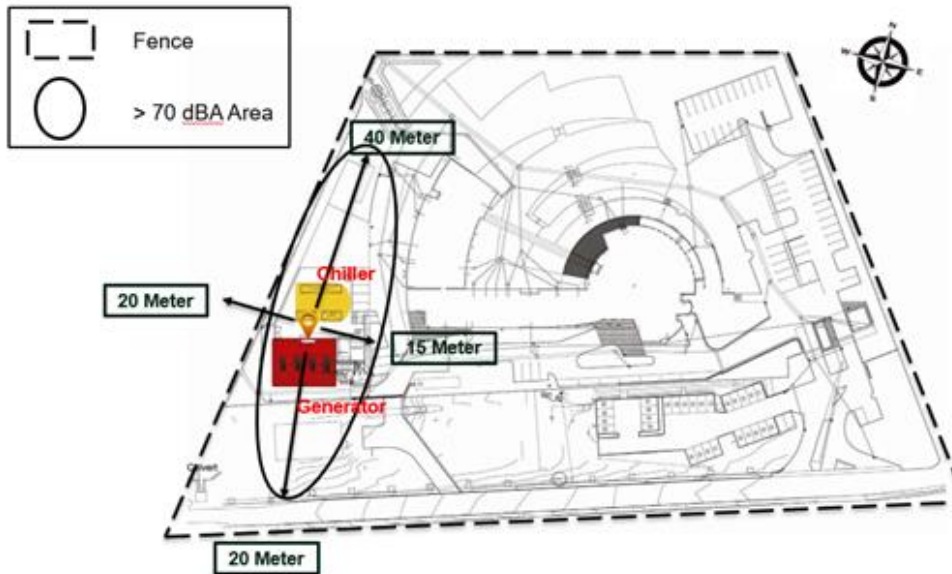
The national emission-quality guideline (NEQG) imposes to address the impacts of noise beyond the property boundary of the facilities. According to this guideline, the noise level should not exceed 70 dBA at the nearest receptor location, like Ownbinkwin village. The distance between the location of the noise source and the village is more than 1 km in most places. It is unlikely that there will be > 70 dBA perceived by the community, and it is also confirmed that there is no complaint related to noise received from the community. The following maps result from regular measurements performed in the PLC/MS sites as of December 2022. The PLC and MS sites are within the noise level of NEQG, and their noise is monitored regularly. .





The following figures depict the noise maps of the Yangon and Thaketa base. The generators, which is the noise source, are available in Thaketa and Yangon head office and are used for emergency purpose only. It means Thaketa and Yangon head office generators will run during the power cut-off. Due to no significant maintenance operations or new infrastructures being installed during six-month, the previous noise map is attached as follows, and the monitoring frequency is five yearly. No complaints have been received until now from the neighboring communities or residences..

YANGON OFFICE – 17-MAY-2019 (09:30 AM-10:30 AM)



Noise Level Measurement

4

YANGON OFFICE - 17-MAY-2019 (09:30 AM-10:30 AM)



Legend

○ >70 dB area
 📍 Chiller
 ★ Generator
 --- Fence

Remark

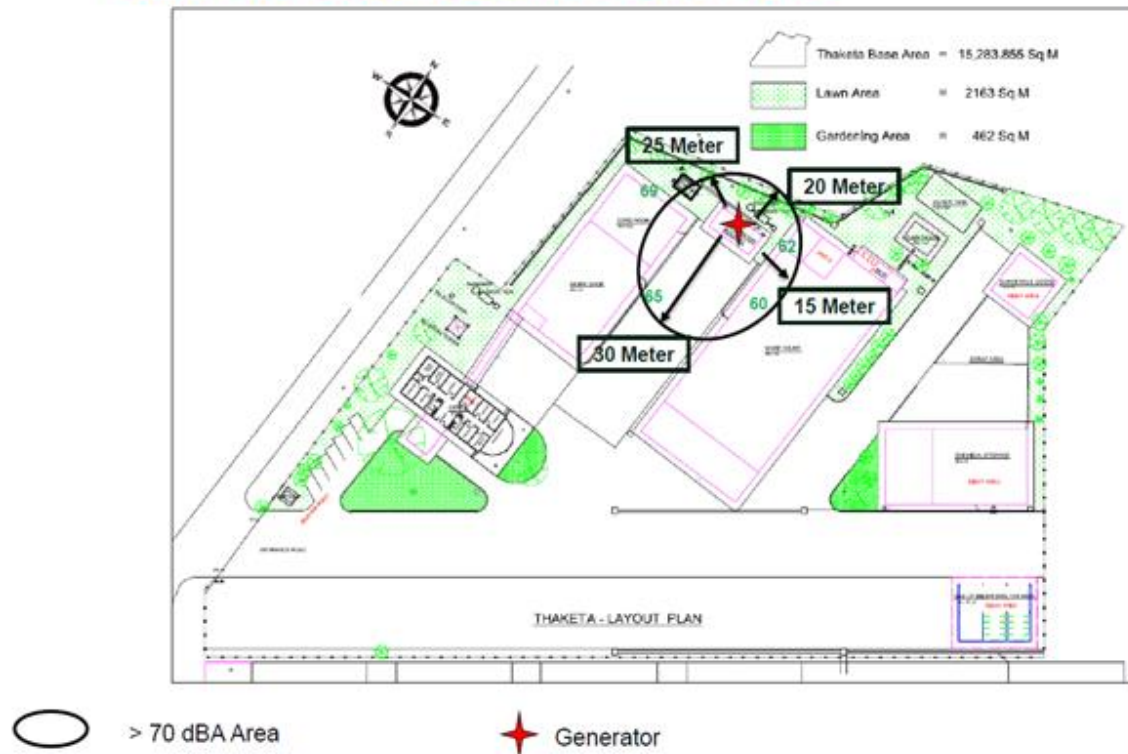
- Measurement during Chiller & Generator running

Noise Level Measurement

3

Figure 3: Noise Map of Yangon Head Office

THAKETA LOGISTICS BASE 2-MAY-2019



THAKETA LOGISTICS BASE – 2-MAY-2019






Figure 4: Noise Map of Thaketa Base

3.2.2 Stormwater and Sanitary Wastewater Monitoring

PLCMS Sites

As the samples of the stormwater are sent to laboratory currently, the monitoring results of previous stormwater are attached for the inlet and outlet of PLC/MS sites. The results of Oil and Grease of the inlet and outlet of the PLC site are within the threshold limit of the National Environmental Quality guideline. Once the results of the samples are received from the laboratory, these results will be presented in the next reporting time.

Advanced Medical & Diagnostics Trading Ltd.				
		Yangon Office : No. 20-A Ywar Lae Lane, Za-North Ward, Thingangyun Township, Yangon. 01-571656, 01-565797, 09-443176248, 09-443112672		
		Mandalay Office : No. MA 28, 59 th street, Between 41 st and 42 nd street, Ye' Mon Taung Ward, Mahar Aung Myay Township, Mandalay. 02-2848201, 02-2848202, 02-2848203, 02-2848204		
		Email : amd@amdmyanmar.com		
		Website : www.amdmyanmar.com		
<hr/>				
WASTE WATER ANALYTICAL RESULT				
Form No: AMD-WTQ-08 (Rev: 0)				
Client	: Total E & P Myanmar			
Type of Sample:	: PLC Inlet (Dawei Site)			
Date of Received	: 28.03.2022			
Date of analysis	: 28.03.2022			
Date of Issued	: 18.04.2022			
Sr.	Item	Result	Unit	National Environmental Quality Emission Guidelines
1.	Oil & Greases	9	mg/L	10
Remark: : Results valid for the received sample only.				
Tested By		Approved By		
Signature	: 	Signature	: 	
Name	: Nyo Nyo Lwin	Name	: Win Pyae Pyae Aung	
Position	: Laboratory Technician	Position	: Laboratory In Charge	



Advanced Medical & Diagnostics Trading Ltd.

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Ward, Mahar Aung Myay Township, Mandalay.
02-2848201, 02-2848202, 02-2848203, 02-2848204
Email : amd@amdmyanmar.com
Website : www.amdmyanmar.com


WASTE WATER ANALYTICAL RESULT

Form No: AMD-WTQ-08 (Rev: 0)

Client : Total E & P Myanmar
Type of Sample: : PLC Outlet (Dawei Site)
Date of Received : 28.03.2022
Date of analysis : 28.03.2022
Date of Issued : 18.04.2022

Sr.	Item	Result	Unit	National Environmental Quality Emission Guidelines
1.	Oil & Greases	10	mg/L	10

Remark: : Results valid for the received sample only.

Tested By
Signature : 
Name : Nyo Nyo Lwin
Position : Laboratory Technician


Approved By
Signature : 
Name : Win Pyae Pyae Aung
Position : Laboratory In Charge

Figure 5: Wastewater Laboratory Result of PLC

Yangon Head Office

The sanitary wastewater of the Yangon Head office is discharged into the sewage treatment system, where effluents are treated before discharging to the nearby drainage. The discharged effluent is sampled and analyzed monthly in the local laboratory. The sample is shown in the picture below. All the tested parameters are within the limit set by YCDC and EQEG guidelines.



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02-2848201, 02-2848202, 02-2848203, 02-2848204
Email : amd@amdmyanmar.com
Website : www.amdmyanmar.com

WASTE WATER ANALYTICAL RESULT

Form No: AMD-WTQ-08 (Rev: 0)

Client : PTTEP International Limited
Type of Sample : Waste Water Effluent
Date of Received : 24.01.2023
Date of analysis : 24.01.2023
Date of Issued : 30.01.2023

Sr.	Item	Result	YCDC Target range
1.	Dissolved Oxygen (DO)	1.2	> 1 ppm
2.	Biochemical Oxygen Demand (BOD ₅) (5days at 20°C) (mg/L)	42.8	20-60 ppm
3.	Chemical Oxygen Demand (COD) (Adaptation of the USEPA 410.4 approved method) (mg/L)	95	< 200 ppm
4.	pH effluent water	6.15	6<pH<9.6
5.	Total suspended solids (TSS)	49	< 500 ppm
6.	Nitrate (NO ₃ -N)	0.0	N/A

Remark: : Results valid for the received sample only.

Tested By

Signature :

Name : Nyo Nyo Lwin

Position : Laboratory Technician

Approved By

Signature :


Name : Win Pyae Pyae Aung

Position : Laboratory In Charge

Figure 6: Laboratory result of YGN Wastewater

Thaketa Logistic Base

Thaketa logistics base is located in the MOGE compound, with other companies' facilities and MOGE office nearby. Its' stormwater drainage is connected to MOGE's workshop drainage system and the network of the Thaketa base. The contracted local laboratory treats the domestic water from a tube well and analyzes it regularly. Besides, the nature of work related to the Thaketa logistics base is mainly the storage of goods and transferring stocks to offshore and onshore facilities. Although neighboring facilities such as MOGE's car workshop, PTTEP's pipe storage facilities, MPI's storage yard are discharged in the compound, the wastewater from the inlet and outlet point is sent to the laboratory for monitoring purposes yearly. According to the recent laboratory result, the result of the outlet point is within the national regulation EQEG limits as below.



Advanced Medical & Diagnostics Trading Ltd.

Yangon Office : No. 20-A Year Lan Lane, 7a-North Ward, Thingangyun Township, Yangon.
01-571656, 01-565797, 09-443176248, 09-443112672

Mandalay Office : No. MA 28, 59th street, Between 41st and 42nd street, Ye' Mon Taung Ward, Mahar Aung Myay Township, Mandalay.
02-2848201, 02-2848202, 02-2848203, 02-2848204

Email : amd@amdmyanmar.com

Website : www.amdmyanmar.com

WASTE WATER ANALYTICAL RESULT

Form No: AMD-WTQ-08 (Rev: 0)

Client : PTTEP Yadanar

Type of Sample: : Waste Water Outlet (Thaketa Site)

Date of Received : 27.07.2022


Date of analysis : 27.07.2022

Date of Issued : 05.08.2022

Sr.	Item	Result	Unit	National Environmental Quality Emission Guidelines
1.	Oil & Grease	6	mg/L	10

Remark: : Results valid for the received sample only.


Tested By

Signature : 

Name : Nyo Nyo Lwin

Position : Laboratory Technician

Approved By

Signature : 

Name : Win Pyae Pyae Aung

Position : Laboratory In Charge

Figure 7: Laboratory result of Thaketa logistics base stormwater

4. Non-Compliance with Environmental Management Plan

During the reporting period from August 2022 – February 2023, there was no non-compliance with EMP approved in September 2018.

5. Accidents or Incidents related to HSE

There was no accidents or incidents related to health safety and environment occurred during the reporting period from August 2022 to February 2023.

6. Verification Audit

The existing environmental management plan is in line with the international standards like ISO 14001 and ISO 5001. Every three years, there is a renewal audit of ISO 14001 while a surveillance audit is performed every year since 2004. In November 2022, a surveillance audit was organized by TUVReinland Co.,Ltd. and its result was attached in Appendix 1. The internal hygiene and environmental audit for 2023 is scheduled in June 2023 and ISO 14001 audit is in September 2023 for all sites. The audit findings will be incorporated in the next report.

7. Major Improvements in PTTEP International Limited (Yangon Branch)

7.1 Installation of Purple Air Monitoring Device in Yangon and Thaketa Logistics Base

Yadana asset management has decided to install a real-time air quality monitoring device in the Yangon office so that the ambient air quality of the Yangon office and its surroundings is informed to the staff and set up the warning system if the outdoor air quality is more than air quality index (AQI) limits defined by WHO. The measurement parameter is particulate matter (PM2.5), a critical indicator of air pollution. By installing this device, the staff can avoid heavy physical activity outdoors if AQI is high and take preventive measures if necessary. The following picture portrays the installation of purple air in the Yangon office.



Figure 8: Ambient air quality monitoring device installed at Yangon Office

The same air quality monitoring device is also being installed at Thaketa Logistics Base (see the below picture) so that the ambient air quality is monitored in real time and takes the necessary actions. The result of Purple Air can be checked in the following website link in real-time: <https://map.purpleair.com/1/mAQI/a10/p604800/cC0#8.17/19.451/96.569>

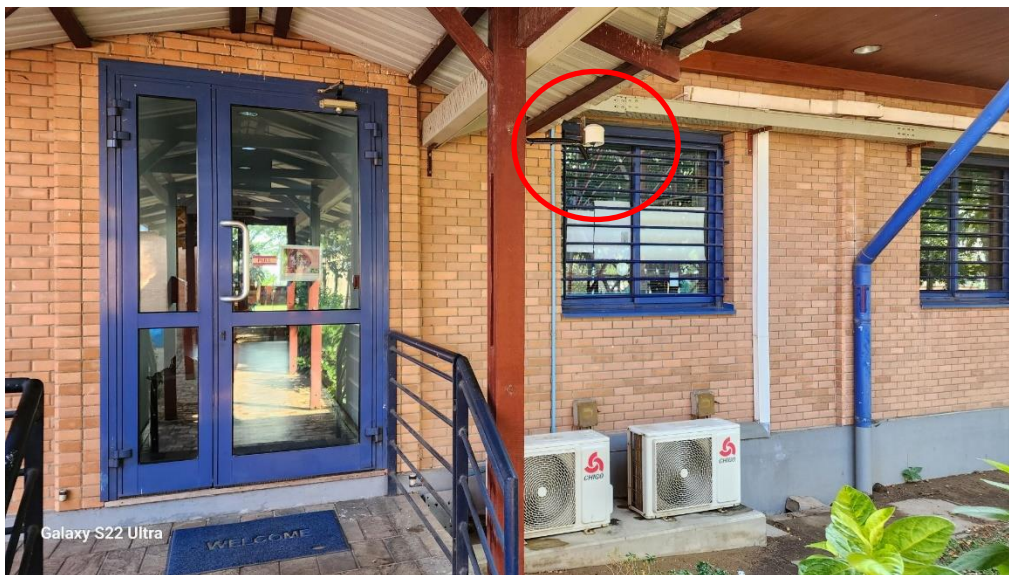


Figure 9: Ambient air quality monitoring device installed at Thaketa Logistics Base

9. Conclusions

During the reporting period between August 2022 and February 2023, regular environmental monitoring activities such as noise, stormwater and wastewater were carried out on offshore and onshore sites. In addition, as a significant improvement, the ambient air quality monitoring device named Purple Air was installed at Yangon Office and Thaketa Logistic base. Within the reporting period, there are no non-compliant environmental and safety incidents.

10. Appendix 1: ISO 14001 Debrief Slides

Welcome to **Closing meeting**

PTTEP International Limited(Myanmar)

Thank you for your cooperation

Audit results

The audit team recommends to TÜV Rheinland Certification committee

2SA:ISO14001:2015

- ☑ 0 Major and 0 Minor nonconformity found.
- ☑ Strength / Positive findings
- ☑ 4 recommendations and opportunities for improvement



Audit results

■ Positive Finding



No.	Unit/Department	Positive findings
1	Management	The management had strong commitment to implement Environmental Management System and cascade to all levels.

Audit results

- **Negative Finding**
- **No Negative finding**



Audit results

■ Recommendations and opportunities for improvement

No.	Unit/Department Site	Recommendations and opportunities for improvement
1	H/Q Yangoon	Auditor recommend for improvement of - Fire pump should be conformed for pipe line color of PTTEPI - Spill kit should be check to actual used as goggle and glove.
2	PLC station	Auditor recommend for improvement of - lightning rod should be install. - 2 nd containment of emergency eye wash and shower to prevent contaminate to ground.
3	Thaketa Logistic	Consideration should be given to review waste register record to ensure that cover waste outgoing.
4	Yanada offshore	Consideration of MSDS of EP 220 which did not find at workplace.

Next steps

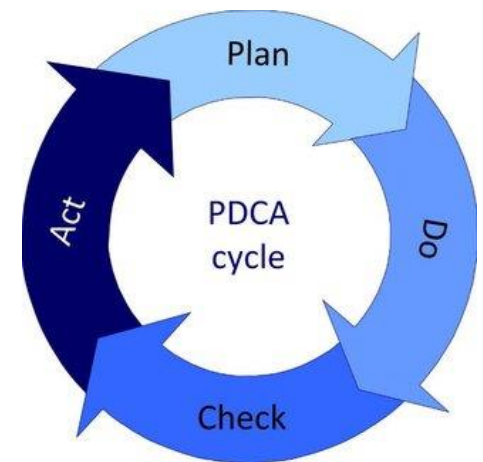
- Questions regarding audit results and recommendation?
- All audit results and evaluation will be documented in the audit report and reviewed by TÜV Rheinland independent certification committee and issue for new certificate within 6-8 weeks.
- Please notify TÜV Rheinland office of any significant changes that may affect your certified management system.

Next Audit

Type of next audit:

Recertification for ISO14001:2015

November 2023 (-3, +0) month (September 2023 to December 2023)



A man in a light blue and white striped shirt and a blue tie is holding a white rectangular sign in front of his chest. The sign has the text "Any Question ?" written on it in a bold, black, sans-serif font. The background is a solid light blue.

Any Question ?

Thank you for your great support again!

