

**Environmental Monitoring Report**  
**For**  
**30 MW Ground Mounted Solar Power Plant Project**  
**Connected to Thazi Substation**  
**(Operation Phase)**  
**(2<sup>nd</sup> Time)**  
**(18<sup>th</sup> July 2024 – 18<sup>th</sup> January 2025)**

Proposed by



Clean Power Energy Co., Ltd.

Prepared by



E Guard Environmental Services

**February, 2025**

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## **Introduction**

This Environmental Monitoring report is prepared by E Guard Environmental Services Co., Ltd., in collaboration with SMEC Myanmar, a subsidiary of Surbana Jurong Group for the 30 MW ground mounted solar power plant project connected to Thazi Substation proposed by Great Success Energy Co., Ltd. The project proponent won tender from the Ministry of Electricity (EPGE PV03/2022-23) and obtained permit for construction and electricity generation from solar energy of the proposed project and it will be implemented by Great Success Energy Co., Ltd., a subsidiary of gold energy. This project is located at Ywa-Gyi Village-tract and Ywa Pale Village-tract, Thazi Township, Meiktila District, Mandalay Region. Its coordinate points are 20° 53' 6.10" N, 96° 2' 5.74" E, and the average altitude of the site is 202m.

The total capacity of capacity of AC side of the proposed project is 33 MW and DC side is 40.887 MWp, including five photovoltaic power generation units. The photovoltaic power station is connected to the 33 kV bus side of the 230 kV main transformer in the Thazi Substation. The project proponent possesses the land slot to construct the solar power plant and total land requirement for the project is 213.97 acres (86.59 hectares) purchased by the project proponent. A total of 74340 Pieces of bifacial mono-crystalline silicon solar PV modules (peak power 550Wp), 110 string inverters, 5 sets of 6600 KVA box transformers, 7 sets of Battery Energy Storage system, and 886 sets of horizontal single-axis tracking bracket will be installed in this proposed project to generate electricity from solar energy.

Environmental quality monitoring team included U Aung Moe Oo, U Ye Chit Zaw and U Khin Zaw Min. The environmental quality monitoring report includes air, water and noise. Air quality monitoring was carried out in one location as source (Project Site) and also water quality test was carried out in two places as ground water (GW- project site) and waste water (WW- Outlet of waste water cannel from the project site). Noise are also measured in two locations as source (Project Site) and receptor (staff housing). Most of the environmental monitoring results (air, water and noise) are within the guidelines.

# 1. METHODOLOGY

Baseline environmental parameters and sampling locations were defined according to the objectives for environmental impact assessment, and monitoring purposes. Locations for sampling and analysis of water quality, ambient air quality and noise level of the project site were identified by e Guard Environmental Services Co., Ltd.

## 1.1 Ambient Air Quality

The emissions of dust particles and gases were measured for 24hrs continuously at the selected sites using the Environmental Perimeter Air Station (EPAS). The results were compared with National Environmental Quality Guidelines NEQG, American Conference of Governmental Industrial Hygienists (ACGIH) and National Ambient Air Quality Standards (NAAQS). EPAS provides direct readings in real time with data-logging capabilities. Air quality is composed of dust and gas emissions of the ambient air.

Table 1. 1 Ambient Air Quality Measurement

<b>Ambient Air Quality (1 location)</b>	
Gas Emission	CO, CO <sub>2</sub> , SO <sub>2</sub> , NO <sub>2</sub>
Dust Emission	PM <sub>10</sub> , PM <sub>2.5</sub>

## 1.2 Ambient Noise

Noise level LAeq (dBA) will be measured at the selected locations that can reflect the exposure of the nearest local community and sensitive locations. Duration and frequency were measured for 24hrs continuously at the selected site using the Sound Pressure Level Meter.

The monitoring procedures, data analysis and interpretation were carried out in accordance with the instrument’s manufacture and National Environmental Quality (Emission) Guidelines, World Health Organization (WHO) and International Finance Corporation (IFC) guidelines in order to be in line with Environmental Conservation Department, Ministry of Natural Resources and Environment Conservation (MONREC). "National Environmental Quality (Emission) Guidelines" for Myanmar was also presented the value of noise level as LAeq (dBA).

Table 1. 2 Noise level monitoring

<b>Noise monitoring (2 locations)</b>	
<b>Noise Emission</b>	LAeq (dBA) (1hrs, 24 hrs.)

Table 1. 3 Equipment used to measure ambient air and noise measurement

<p><b>Davis Vantage Pro2 Wireless Weather Station</b>            Provides detailed current weather conditions and expanded forecasts - all at a glance            The Vantage Pro2 uses a frequency-hopping spread spectrum radio from 902 MHz to 928 MHz to transmit and receive data up to 1,000’ (300m) line of sight. In addition, the weather station features a</p>	
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<p>bubble level, improved anemometer base, redesigned wind cups, and factory-calibrated wind direction. The integrated sensor suite combines temperature and humidity sensors, rain collector with an aluminum-plated tipping bucket, and anemometer into one package for easy setup. Measure inside and outside temperature and humidity, heat index, barometric pressure, dew point, rainfall, wind direction and speed, and wind chill.</p>	
<p><b>Haz-Scanner EPAS</b>  PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, SO<sub>2</sub>, CO, CO<sub>2</sub>, Temperature, and Relative Humidity</p>	
<p><b>Digital Sound Level Meter</b>  Noise</p>	

Figure 1. 1 Environmental Quality Measuring during Operation Period

	<p>Air and noise quality measuring  at Thazi Solar Power Project  12.01.2025 to 13.01.2025  (at source project site)</p>
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Noise quality measuring  
 at Thazi Solar Power Project  
 12.01.2025 to 13.01.2025  
 (at staff housing)

### 1.3 Water Quality

Water samples were collected on site with appropriate sampling equipment and procedures. The sampling team has pre-arranged with the labs in Yangon for analysis and logistic arrangement made to reach the preserved samples with unique IDs to the designated labs within 48hrs.

The sampling and survey team has a list of local laboratories providing analytical services for ground water, waste water and surface water quality analysis. Up to this date, there is no laboratory having accredited certification for water quality testing (environmental analysis) in Myanmar. SGS (Myanmar), ISO (Myanmar). Laboratories have used for water quality analysis among the list of laboratories. These laboratories have been recognized as a long-term establishment in Myanmar and employed qualified technical staffs.

The following laboratories were used for analysis of water and parameter shown in the **Table 1.4**.

1. PRO Lab, No. (9), Sabae Housing, Pyi Htaung Su Road, (26) Ward, South Dagon Tsp, Yangon, Myanmar. Tel: 09 893 767424
2. Water Quality Laboratory, Forest Research Institute, Yezin, Nay Pyi Taw. Tel: 09 430 19169, 09 420 705131

Table 1. 4 Environmental Quality Parameters for Water quality


<b>Waste Water Parameters (1 location)</b>	
Physical Parameter	Total Suspended Solids
Chemical Parameter	BOD, COD, pH
Biological Parameter	Total Coliform Bacteria
Nutrients	Total Nitrogen, Total Phosphorus



Compounds	Oil & grease
<b>Ground Water Parameters (1 location)</b>	
Physical Parameter	Total Suspended Solids, Turbidity, Total Dissolved Solids, Dissolved Oxygen
Chemical Parameter	BOD, COD, pH, EC, Salinity, Oxidation Reduction Potential (ORP)
Biological Parameter	Total Coliform Bacteria
Metal	Potassium
Nutrients	Total Nitrogen, Total Phosphorus
Compounds	Oil & grease

Water samplings are conducted using the following equipment as shown in figure (Table 1. 5).

Table 1. 5 Equipment for Water Sampling

<b>Water Sampling Bottle</b>	
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#### 1.4 Monitoring and Sampling Locations

Sampling locations were confirmed by environmental specialist on site before doing the sampling. Water quality sampling locations consist of one waste water locations (WWQ: outlet of waste water channel from the project site) and one ground water location (GWQ: Project Site) which is situated near the project site). Air quality was monitored at the selected one location (Thazi solar power project site (source) that can get results of the existing ambient air quality.



Figure 1. 2 Air Quality Monitoring Locations of Thazi Solar Power Project



Figure 1. 3 Noise Quality Monitoring Locations of Thazi Solar Power Project



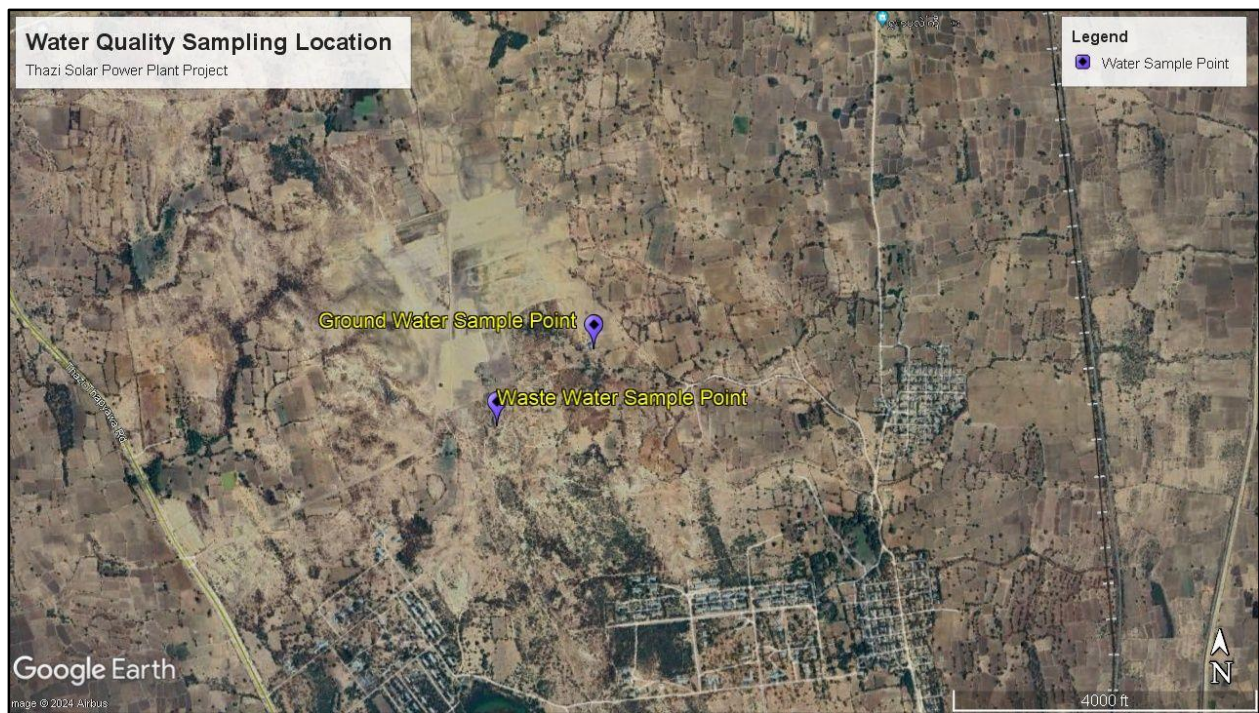


Figure 1. 4 Water Quality Sampling Locations of Thazi Solar Power Project

Table 1. 6 Locations of Environmental Quality sampling points

Locations No.	Points	Coordinate	Locations
<b>Ambient Air Quality Monitoring Location</b>			
1.	AQ1	Lat - 20°52'54.07"N, Long - 96° 2'6.83"E	Project Site
<b>Noise Quality Monitoring Locations</b>			
1.	NQ1	Lat - 20°52'54.07"N, Long - 96° 2'6.83"E	Project Site
2.	NQ2	Lat - 20°52'50.71"N, Long - 96° 2'1.56"E	Project Site (Receptor)
<b>Waste Water Quality Monitoring Location</b>			
1.	WWQ	Lat - 20°52'59.01"N, Long - 96° 2'20.93"E	Outlet of waste water cannel from the project site
<b>Ground Water Quality Sampling Location</b>			
1.	GWQ	Lat - 20°52'49.04"N, Long - 96° 2'7.74"E	Project Site

## 2. ENVIRONMENTAL QUALITY

### 2.1 Ambient Air Quality

The air quality monitoring was done at selected locations during 12<sup>th</sup> to 13<sup>th</sup> January 2025. During this survey, these parameters were measured with adequate devices named Environmental

Perimeter Air Station (EPAS) viz; Particulate Matters (PM<sub>10</sub> and PM<sub>2.5</sub>) and gases CO<sub>2</sub>, CO, SO<sub>2</sub>, NO<sub>2</sub> via 24-hour basis. The results and guidelines of all emission pollutants are shown in table.

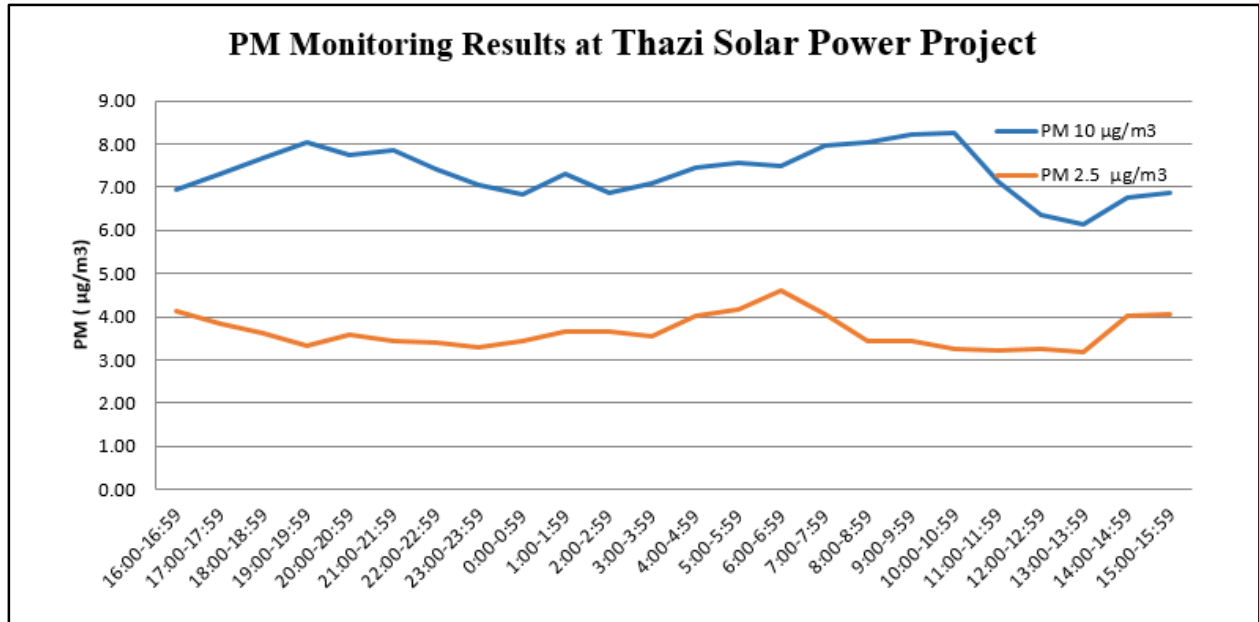


Figure 2. 1 PM Monitoring Results at Thazi Solar Power Project

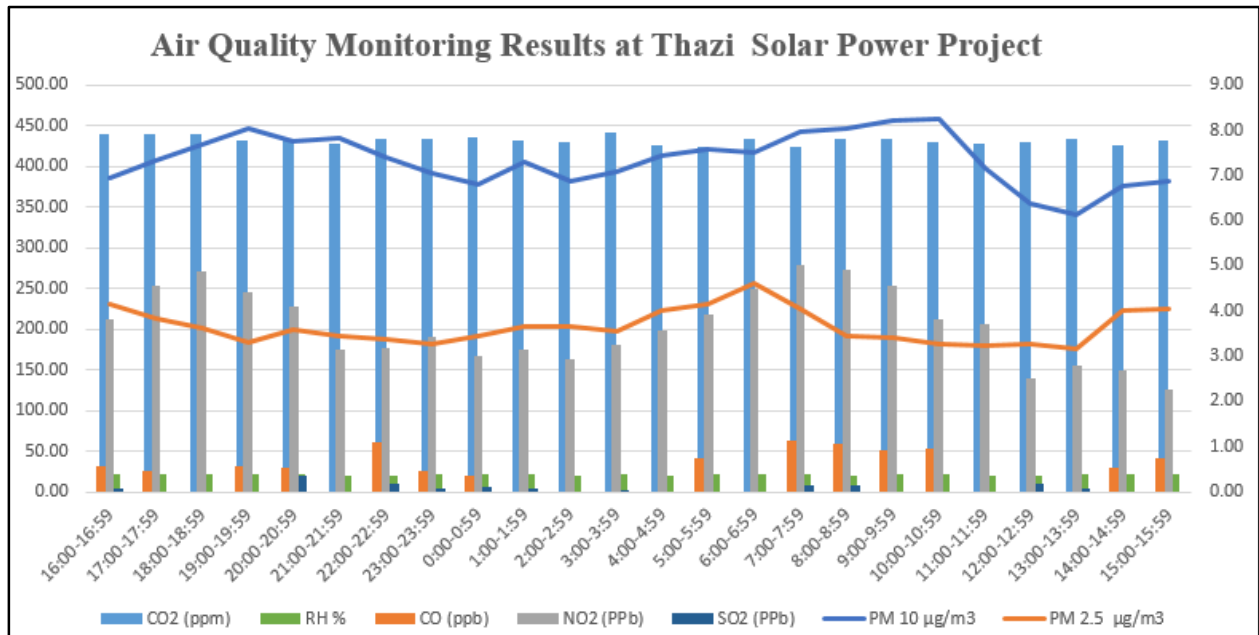


Figure 2. 2 Fluctuation of Air Pollutants during Dial Cycle at Thazi Solar Power Project

**Particulate matters (PM<sub>10</sub> and PM<sub>2.5</sub>)** results are with in guideline values as shown in table. Atmospheric particulate matters such as PM<sub>10</sub> and PM<sub>2.5</sub> have their ability to reach the deepest part of lungs and so affect respiratory process. In this air quality survey of the project site, the surveyed results of these particulate matters gathered from EPAS. The results with one-hour interval are shown in the following table.

**Sulfur Dioxide (SO<sub>2</sub>)** is generated from combustion of fuels such as oil and coal, and as by-product from some chemical production or wastewater treatment processes. On-road and off-road vehicles are also emission source of SO<sub>2</sub>. SO<sub>2</sub> irritates the respiratory tract, injures lung tissues and reduces visibility and level of sunlight. The emission can be controlled by implementation of manufacturer recommended engine maintenance programs, good driving practices, installing and maintaining emissions control devices, and implementing a regular vehicle maintenance and repair program.

**Nitrogen Oxides (NO<sub>x</sub>)** in the ambient air consist of nitric oxide (NO), nitrogen dioxide (NO<sub>2</sub>) and nitrous oxide (N<sub>2</sub>O). NO<sub>2</sub> is formed by chemical reaction of NO and ozone. The main sources of NO<sub>2</sub> are combustion of fuel and on-road and off-road vehicles. NO<sub>2</sub> decreases lung function and resistance to infection. The gas emission can be monitored by combustion modification, flue gas recirculation, water/ steam injection and the same measures for SO<sub>2</sub> reduction.

Likewise, **Carbon Monoxide (CO) and Carbon dioxide (CO<sub>2</sub>)** have the same emission sources and mitigation measures for SO<sub>2</sub> and NO<sub>2</sub>. They are poisonous gas and cause damage to the respiratory organ. Guidelines 2013, adopted threshold limit values of CO<sub>2</sub> is 5,000 ppm for 8-hour, time-weighted average. Thus, it can be concluded that the existing CO<sub>2</sub> level is acceptable for human health.

Detail results and variation patterns with one-hour interval of pollutants are shown in tables and figures below. Results of average, peak and minimum of a day are calculated in the table.

Table 2. 1 Air Pollutants Emission Results (Thazi Solar Power Project)

Date	Time		CO <sub>2</sub> (ppm)	CO (ppb)	NO <sub>2</sub> (ppb)	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	RH %	SO <sub>2</sub> (ppb)
11.01.2025	16:00-16:59	Average	439.95	0.55	3.83	6.95	4.14	21.31	0.07
11.01.2025	17:00-17:59	Average	439.72	0.47	4.57	7.32	3.82	21.86	0.00
11.01.2025	18:00-18:59	Average	439.15	0.00	4.87	7.69	3.61	21.05	0.00
11.01.2025	19:00-19:59	Average	432.66	0.55	4.40	8.05	3.32	21.19	0.00
11.01.2025	20:00-20:59	Average	431.13	0.53	4.11	7.76	3.59	20.77	0.37
11.01.2025	21:00-21:59	Average	427.93	0.00	3.15	7.84	3.43	20.31	0.00
11.01.2025	22:00-22:59	Average	433.89	1.09	3.19	7.42	3.39	20.57	0.17
11.01.2025	23:00-23:59	Average	434.19	0.46	3.42	7.04	3.28	21.28	0.09
12.01.2025	0:00-0:59	Average	435.54	0.36	2.99	6.82	3.44	21.38	0.10
12.01.2025	1:00-1:59	Average	431.03	0.00	3.13	7.31	3.65	20.96	0.07
12.01.2025	2:00-2:59	Average	430.30	0.00	2.93	6.87	3.67	20.47	0.00
12.01.2025	3:00-3:59	Average	440.66	0.00	3.24	7.09	3.56	20.79	0.01
12.01.2025	4:00-4:59	Average	424.99	0.00	3.56	7.44	4.01	20.68	0.00
12.01.2025	5:00-5:59	Average	424.82	0.75	3.94	7.57	4.17	20.90	0.00
12.01.2025	6:00-6:59	Average	433.90	0.00	4.50	7.50	4.61	20.83	0.00
12.01.2025	7:00-7:59	Average	424.65	1.14	5.02	7.95	4.06	20.80	0.13
12.01.2025	8:00-8:59	Average	432.98	1.06	4.93	8.04	3.44	20.19	0.15
12.01.2025	9:00-9:59	Average	434.63	0.91	4.57	8.21	3.42	21.85	0.00
12.01.2025	10:00-10:59	Average	429.88	0.95	3.83	8.26	3.27	21.25	0.00
12.01.2025	11:00-11:59	Average	428.60	0.00	3.69	7.14	3.23	20.55	0.00
12.01.2025	12:00-12:59	Average	429.54	0.00	2.50	6.37	3.27	20.49	0.19
12.01.2025	13:00-13:59	Average	434.04	0.00	2.80	6.13	3.18	21.14	0.06
12.01.2025	14:00-14:59	Average	425.72	0.55	2.68	6.78	4.02	21.52	0.00
12.01.2025	15:00-15:59	Average	431.01	0.76	2.25	6.86	4.05	21.29	0.00
<b>Average</b>			<b>432.12</b>	<b>0.42</b>	<b>3.67</b>	<b>7.35</b>	<b>3.65</b>	<b>20.98</b>	<b>0.06</b>
<b>1 hour Minimum</b>			424.65	0.00	2.25	6.13	3.18	20.19	0.00
<b>1 hour Maximum</b>			440.66	1.14	5.02	8.26	4.61	21.86	0.37

Table 2. 2 Air Emission Levels (Standard)

No.	Parameter	Unit	Maximum Concentration	
			National	Average Period
1.	Carbon monoxide	mg/m <sup>3</sup>	9	8-hour
2.	Carbon dioxide	ppm	5000	8-hour
3.	Sulfur dioxide	μg/m <sup>3</sup>	20 500	24-hour 10-minute
4.	Nitrogen dioxide	μg/m <sup>3</sup>	40 200	1 year 1 hour
5.	Particulate matter PM <sub>10</sub>	μg/m <sup>3</sup>	20 50	1-year 24-hour
6.	Particulate matter PM <sub>2.5</sub>	μg/m <sup>3</sup>	10 25	1-year 24-hour

Source: Myanmar National Environmental Quality (Emission) Guidelines, National Ambient Air Quality Standards (NAAQS), American Conference of Governmental Industrial Hygienists (ACGIH).

Detail results with one-hour interval of pollutants are shown in **Table 2. 1**. The average, peak and minimum values of results per day are calculated. All results are under the Myanmar National Environmental Quality (emission) Guidelines.

Table 2. 3 Observed Ambient Air Quality Results from Selected Points

Parameters	Observed Values	NEQG Guidelines Value	ACGIH Guidelines Value	NAAQS Guidelines Value	Unit	Averaging Period
PM <sub>10</sub>	7.35	50	-	-	μg/m <sup>3</sup>	24hrs
PM <sub>2.5</sub>	3.65	25	-	-	μg/m <sup>3</sup>	24hrs
CO	0.00053	-	-	9	ppm	8hrs
CO <sub>2</sub>	434.83	-	5000	-	ppm	8hrs
SO <sub>2</sub>	0.15	20	-	-	μg/m <sup>3</sup>	24hrs
NO <sub>2</sub>	9.44	200	-	-	μg/m <sup>3</sup>	1hrs

## 2.2 Ambient Noise

Ambient noise level for the proposed project was measured with Digital Sound Level Meter at the project site. The noise level measurement is conducted at Thazi solar power project points: these points are nearly the air monitoring points and staff housing on 12<sup>th</sup> to 13<sup>th</sup> January 2025. Measuring period is 24 hours continuously. The observed values are described in **Table 2. 4** and **Table 2. 5** and the following figures are noise level measurement at the proposed project.

Table 2. 4 Observed Values of Noise Level Measurement at Thazi Solar Project Site (Source)

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	12.01.2025	7:00:27-7:59:27	62.27	A	Day	54.49
2	12.01.2025	8:00:27-8:59:27	51.10	A	Day	
3	12.01.2025	9:00:27-9:59:27	50.93	A	Day	
4	12.01.2025	10:00:27-10:59:27	62.38	A	Day	
5	12.01.2025	11:00:27-11:59:27	51.27	A	Day	
6	12.01.2025	12:00:27-12:59:27	47.97	A	Day	
7	12.01.2025	13:00:27-13:59:27	62.44	A	Day	
8	12.01.2025	14:00:27-14:59:27	52.88	A	Day	
9	12.01.2025	15:00:27-15:59:27	61.71	A	Day	
10	11.01.2025	16:00:27-16:59:27	51.59	A	Day	
11	11.01.2025	17:00:27-17:59:27	48.01	A	Day	
12	11.01.2025	18:00:27-18:59:27	61.88	A	Day	
13	11.01.2025	19:00:27-19:59:27	53.18	A	Day	
14	11.01.2025	20:00:27-20:59:27	48.61	A	Day	
15	11.01.2025	21:00:27-21:59:27	51.07	A	Day	
16	11.01.2025	22:00:27-22:59:27	62.19	A	Night	53.65
17	11.01.2025	23:00:27-23:59:27	45.36	A	Night	
18	12.01.2025	0:00:27-0:59:27	52.18	A	Night	
19	12.01.2025	1:00:27-1:59:27	62.27	A	Night	
20	12.01.2025	2:00:27-2:59:27	44.96	A	Night	
21	12.01.2025	3:00:27-3:59:27	52.35	A	Night	
22	12.01.2025	4:00:27-4:59:27	62.19	A	Night	
23	12.01.2025	5:00:27-5:59:27	50.09	A	Night	
24	12.01.2025	6:00:27-6:59:27	51.26	A	Night	
<b>Average</b>			<b>54.17</b>			



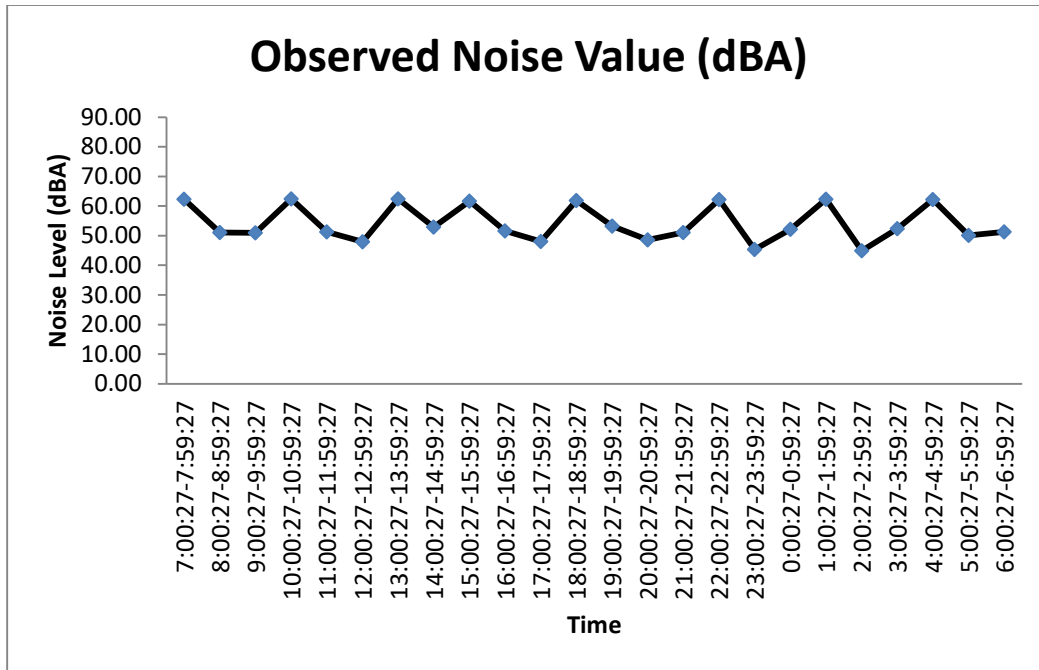


Figure 2. 3 Noise Level at Thazi Solar Project Site (Source)

Table 2. 5 Observed Values of Noise Level Measurement at Staff Housing (Receptor)

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	12.01.2025	7:00:27-7:59:27	55.23	A	Day	48.17
2	12.01.2025	8:00:27-8:59:27	55.12	A	Day	
3	12.01.2025	9:00:27-9:59:27	40.64	A	Day	
4	12.01.2025	10:00:27-10:59:27	61.66	A	Day	
5	12.01.2025	11:00:27-11:59:27	54.23	A	Day	
6	12.01.2025	12:00:27-12:59:27	49.73	A	Day	
7	12.01.2025	13:00:27-13:59:27	44.03	A	Day	
8	12.01.2025	14:00:27-14:59:27	46.02	A	Day	
9	12.01.2025	15:00:27-15:59:27	47.00	A	Day	
10	11.01.2025	16:00:27-16:59:27	56.60	A	Day	
11	11.01.2025	17:00:27-17:59:27	40.56	A	Day	
12	11.01.2025	18:00:27-18:59:27	43.82	A	Day	
13	11.01.2025	19:00:27-19:59:27	42.61	A	Day	
14	11.01.2025	20:00:27-20:59:27	45.82	A	Day	
15	11.01.2025	21:00:27-21:59:27	39.44	A	Day	
16	11.01.2025	22:00:27-22:59:27	41.06	A	Night	44.54
17	11.01.2025	23:00:27-23:59:27	51.23	A	Night	
18	12.01.2025	0:00:27-0:59:27	51.21	A	Night	

19	12.01.2025	1:00:27-1:59:27	41.64	A	Night
20	12.01.2025	2:00:27-2:59:27	41.64	A	Night
21	12.01.2025	3:00:27-3:59:27	41.63	A	Night
22	12.01.2025	4:00:27-4:59:27	41.23	A	Night
23	12.01.2025	5:00:27-5:59:27	41.60	A	Night
24	12.01.2025	6:00:27-6:59:27	49.66	A	Night
<b>Average</b>			<b>46.81</b>		

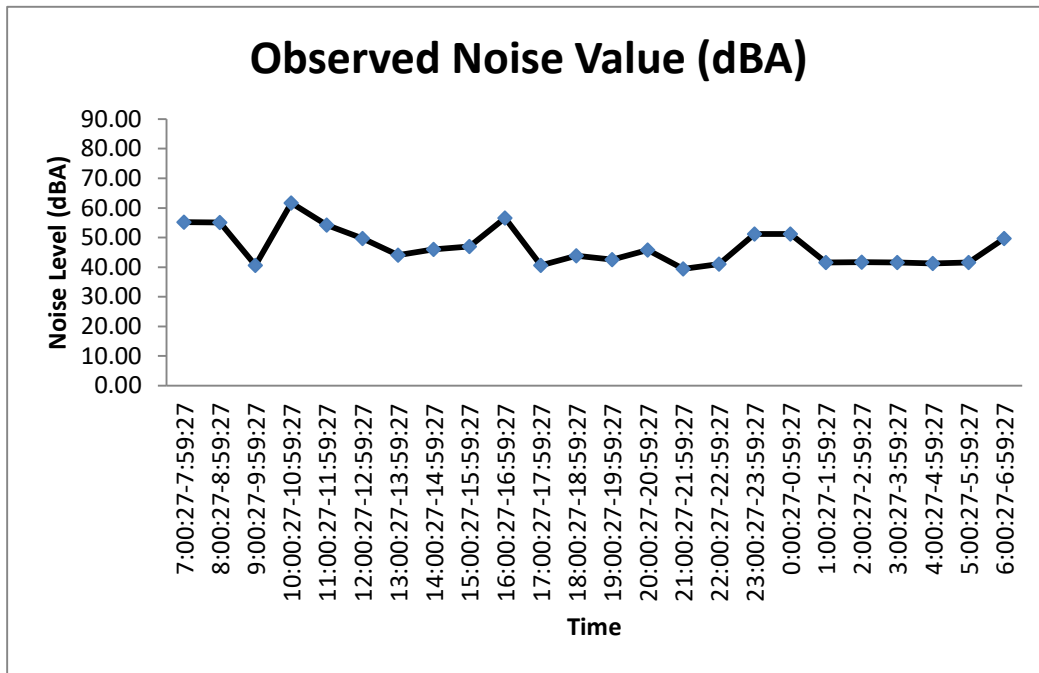


Figure 2. 4 Noise Level at Staff Housing (Receptor)

Table 2. 6 Observed Ambient Noise Level Results from Selected Points

Point	Thazi Solar Power Project	
	Day Time	Night Time
Project Site (Source)	54.49	53.65
Guideline Values for Industrial	70	70
Staff Housing (Receptor)	48.17	44.54
Guideline Values for Residential	55	45

The observed values are compared with the National Environmental Quality (Emission) Guidelines as shown in **Table 2. 6** except receptor point, which indicates the separate level for residential and industrial points.

Table 2. 7 National Environmental Quality (Emission) Guidelines Values for Noise Level

Receptor	One Hour LAeq (dBA)	
	Daytime 07:00 - 22:00 (10:00 - 22:00 for Public Holidays)	Nighttime 22:00 - 07:00 (22:00 - 10:00 for Public Holidays)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

The observed values of the proposed project for daytime at Thazi Solar Power Project Site (source) and Staff Housing (Receptor) are 54.49 dB (A) and 48.17 dB (A). The observed values of the proposed project for nighttime at Thazi Solar Power Project Site (source) and Staff Housing (Receptor) are 53.65 dB (A) and 44.54 dB (A). So, the observed daytime value and night time value for Thazi Solar Power Project Site (source) and Staff Housing (Receptor) are lower than the guideline value.

### 2.3 Wind Speed and Direction

The following figures describe the wind speed and wind direction of the proposed project site (Thazi Solar Power Project Site at source) on 12<sup>th</sup> to 13<sup>th</sup> January 2025 respectively. According to the data, the wind direction is following **Figure 2. 5** and **Figure 2. 6**.

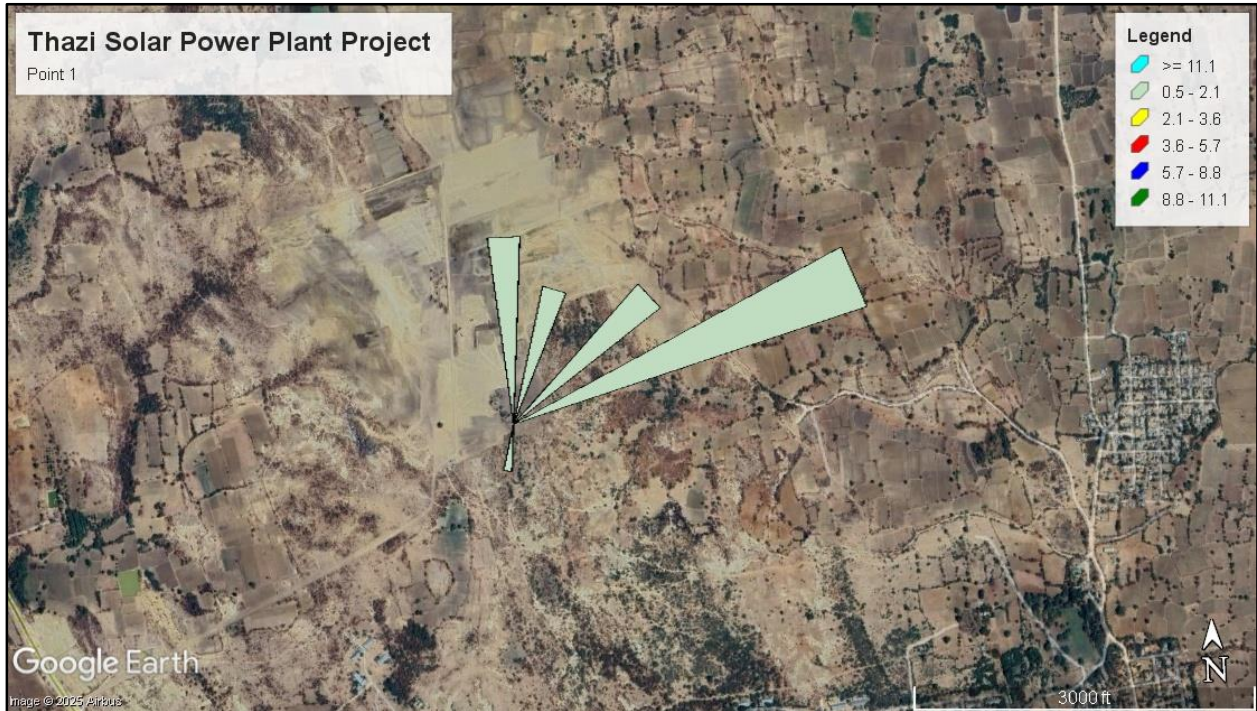


Figure 2. 5 Wind Speed and Wind Direction (Blowing From) at Thazi Solar Power Project Site

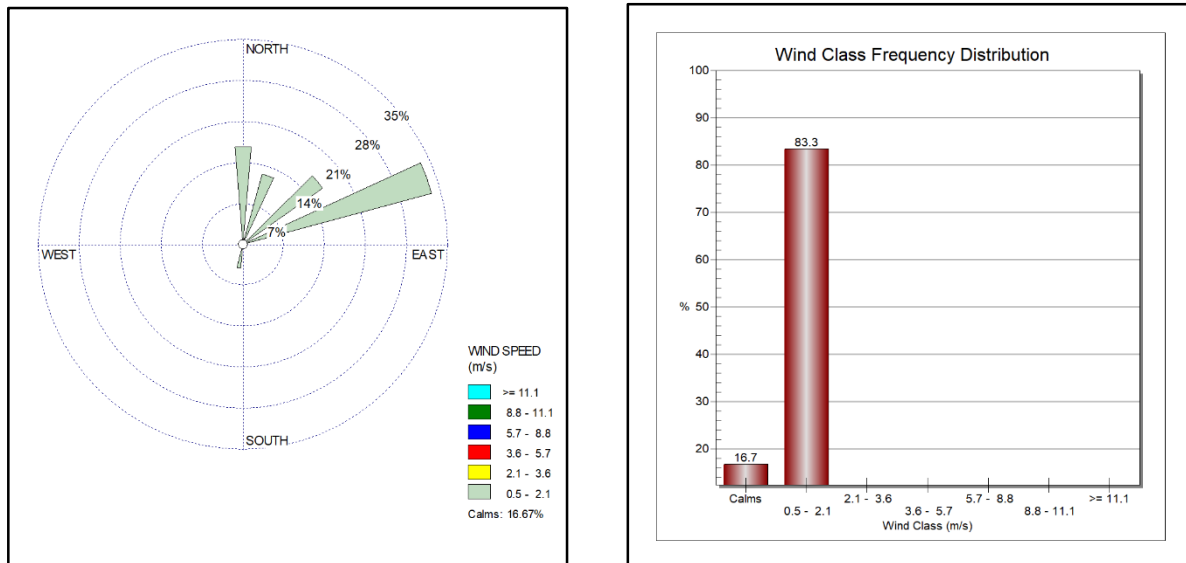


Figure 2. 6 Wind Class Frequency Distribution at the Thazi Solar Power Project Site

## 2.4 Water quality

The project proponent is responsible for ensuring the drainage or runoff from the project or its related activities do not deteriorate the existing waste water and ground water quality before the project implementation. Waste water and ground water quality were recorded by laboratory analysis at two selected locations systematically. The field surveys for environmental quality monitoring and sampling were done during 13<sup>th</sup> January 2024.

Objectives of the sampling and analysis of waste water and ground water is to understand the existing water quality at the selected locations and to monitor the impacts during operation period.

Table 2. 8 Ground Water Quality of Thazi Solar Power Project

Item	Unit	Ground Water	WHO Drinking Water Guideline	NDWQS (2014), MOH, Myanmar.
Biological Oxygen Demand (BOD)	mg/l	0.73	-	-
Chemical Oxygen Demand (COD)	mg/l	2	-	-
Dissolved Oxygen (on-site)	mg/l	8.98	-	-
Electrical Conductivity (on-site)	mS/cm	1.61	-	-
pH (on-site)	-	8.02	6.5-8.5	-
Oil & Grease	mg/l	3	-	-
Oxidation Reduction Potential (ORP) (on-site)	ORPmV	264	-	-
Salinity (on-site)	ppt	0.8	-	-
Turbidity (on-site)	NTU	238	-	-
Total Dissolved Solids (on-site)	g/l	1.03	-	-
Total Nitrogen	mg/l	0.84	-	-
Total Phosphorus	mg/l	0.01943	-	-
Total suspended solid (TSS)	mg/l	111	-	-
Total coliform bacteria	MPN/ml	<0.3	Not detected	3
Potassium	mg/l	<0.02	-	-

Table 2. 9 Waste Water Quality of Thazi Solar Power Project

Item	Unit	Waste Water	National Environmental Quality (Emission) Guideline for Electric Power Transmission and Distribution
Biological Oxygen Demand (BOD)	mg/l	1.6	30
Chemical Oxygen Demand (COD)	mg/l	6	125

pH	-	8.66	6-9
Total Nitrogen	mg/l	2.25	10
Total Phosphorus	mg/l	0.16438	2
Oil and Grease	mg/l	4	10
Total suspended solid (TSS)	mg/l	6	50
Total coliform bacteria	CFU/100ml	4.3	400

**Photo Record for Water Quality Sampling**

	<p align="center"> <b>WWQ 1</b>          (outlet from the project site)       </p>
	<p align="center"> <b>GWQ</b>          (from the project site)       </p>

### 3. ENVIRONMENTAL MONITORING PLAN

#### 3.1 Monitoring Records for Safety Plan

Monitoring Record for Safety Plan

Monthly Record					
Date	Place	Activity	Organization	Number of Attends	Remarks
18.8.2024	Working Area	Aware Training About PPE	<u>Thazi</u> Solar Power Plant	13	
7.9.2024	Power <u>Staion</u>	Provide PPE Safety Equipment	<u>Thazi</u> Solar Power Plant	18	
18.12. 2024	Working Area	Electrical Safety Training	<u>Thazi</u> Solar Power Plant	18	
27.12.2024	Power <u>Staion</u>	Fire Safety Training	<u>Thazi</u> Solar Power Plant	48	

### Monitoring Record for Occupational Safety Equipment

Date	Place	Type	Quantity	Inspected By	Supervisor	Remark
15.Nov.2024	Store	Safety Shoe	18	U Sai Bo Bo	U Kyaw Zin Htet	
15.Nov.2024	Store	Safety Gloves	18	U Sai Bo Bo	U Kyaw Zin Htet	
15.Nov.2024	Store	Safety Helmet	18	U Sai Bo Bo	U Kyaw Zin Htet	
15.Nov.2024	Store	Safety Belt	18	U Sai Bo Bo	U Kyaw Zin Htet	



## Records of Health and Safety Plan Activities





**Emergency Contact List Attached in the Project Site**

အရေးပေါ်အခြေအနေတုံ့ပြန်နိုင်မှု အစီအစဉ်

စီမံကိန်းအလုပ်ငန်းခွင်အတွင်းမှ အရေးကြီး ဆက်သွယ်ရမည့် ဖုန်းနံပါတ်များ		
အမည်	ရာထူး	ဖုန်းနံပါတ်
ဦးကျော်ဇင်ထက်	စက်ရုံမှူး	09-259201955
ဦးစိုင်းဘိုဘို	ဒု-စက်ရုံမှူး	09-420732352
ဦးကျော်ဝင်းနိုင်	လုပ်ငန်းခွင်အန္တရာယ်ကင်းရှင်းရေးအရာရှိ	09-685309064
ဦးအောင်ကျော်မင်း	ကြီးကြပ်ရေးမှူး	09-690566676
ဦးရှုခိုင်	ရှေးဦးသူနာပြု	09-677786911
ဦးသိန်းစိုး	အရေးပေါ်အခြေအနေ ထိန်းချုပ်ရေးမှူး	09-459946678

အရေးကြီး ဆက်သွယ်ရမည့် ဒေသအတွင်းဖုန်းနံပါတ်များ

အမည် (ဌာန)	အကြောင်းအရာ	ဖုန်းနံပါတ်
မြို့နယ်မီးသတ်ဌာန	မီးလောင်ခြင်းအတွက်	064-2069191
မြို့နယ်ရဲစခန်း	လုံခြုံရေးကိစ္စများအတွက်	09-428325491
မြို့နယ်ဆေးရုံ	ထိခိုက်ဒဏ်ရာရသူများအတွက်	09-420174467
မြို့နယ်လျှပ်စစ်ဌာန	လျှပ်စစ်မီးကိစ္စ	09-441255505
မြို့နယ် အထွေထွေ အုပ်ချုပ်ရေးဌာန	အထွေထွေ အုပ်ချုပ်ရေးကိစ္စ	09-265005096

### Fire Extinguisher Check List

No	Date	Description	Location	Number	Unit	Remarks
1	18/12/2024	Fire Extinguisher (50Kg)	Power Station	1	Nos	
2	18/12/2024	Fire Extinguisher (5Kg)	Power Station	5	Nos	
3	18/12/2024	Fire Extinguisher (5Kg)	Briefing Hall	3	Nos	
4	18/12/2024	Fire Extinguisher (5Kg)	6Unit	2	Nos	
5	18/12/2024	Fire Extinguisher (5Kg)	Messing	2	Nos	
6	18/12/2024	Fire Extinguisher (5Kg)	Kitchen Room	3	Nos	
7	18/12/2024	Fire Extinguisher (5Kg)	Main Gate	2	Nos	
8	18/12/2024	Fire Extinguisher (5Kg)	Gate (1)	2	Nos	
9	18/12/2024	Fire Extinguisher (50Kg)	Primary Cabin	1	Nos	
10	18/12/2024	Fire Extinguisher (10Kg)	Primary Cabin	2	Nos	
11	18/12/2024	Fire Extinguisher (10Kg)	Secondary Cabin	2	Nos	
12	18/12/2024	Fire Extinguisher (5Kg)	SVG X'mer	2	Nos	
13	18/12/2024	Fire Extinguisher (5Kg)	Station X'mer	2	Nos	
14	18/12/2024	Fire Extinguisher (5Kg)	BESS (1)	2	Nos	
15	18/12/2024	Fire Extinguisher (5Kg)	BESS (2)	2	Nos	
16	18/12/2024	Fire Extinguisher (5Kg)	BESS (3)	2	Nos	
17	18/12/2024	Fire Extinguisher (5Kg)	BESS (4)	2	Nos	
18	18/12/2024	Fire Extinguisher (5Kg)	BESS (5)	2	Nos	
19	18/12/2024	Fire Extinguisher (5Kg)	BESS (6)	2	Nos	
20	18/12/2024	Fire Extinguisher (5Kg)	BESS (7)	2	Nos	
21	18/12/2024	Fire Extinguisher (5Kg)	STS	2	Nos	
22	18/12/2024	Fire Extinguisher (5Kg)	Box X'mer (1)	3	Nos	
23	18/12/2024	Fire Extinguisher (5Kg)	Box X'mer (2)	3	Nos	
24	18/12/2024	Fire Extinguisher (5Kg)	Box X'mer (3)	3	Nos	



25	18/12/2024	Fire Extinguisher (5Kg)	Box X'mer (4)	3	Nos	
26	18/12/2024	Fire Extinguisher (5Kg)	Box X'mer (5)	3	Nos	
27	18/12/2024	Fire Extinguisher (5Kg)	Mechanic	2	Nos	
Total				62	Nos	

#### 4. Records for CSR activities

##### Records for CSR Activities

Date	Place	Type	Amount (MMK)/Activities	Received By
28.9.2024	ကျိုတိုင်ကုန်း-ရွာပုလဲကျေးရွာ	ကျိုတိုင်ကုန်းမြောက်ရွာ-ရွာပုလဲကျေးရွာချင်းဆက်လမ်းအားလမ်းပြုပြင်ခြင်း		
29.9.2024	သုံပတ်လည်ကျေးရွာ	သုံပတ်လည်ကျေးရွာရေဘေးအတွက်ပြန်လည်ထူထောင်ရေးပစ္စည်းများလှူဒါန်းခြင်း		
17.10.2024	ရွာပုလဲကျေးရွာ ကျောင်းတိုက်	ဆွမ်းဆန်စိမ်းလောင်းလှူခြင်း		
8.11.2024	ရွာပုလဲကျေးရွာ ကျောင်းတိုက်	ရွာပုလဲကျေးရွာကထိန်တွင်ဝတ္ထုငွေလှူဒါန်းခြင်း		
18.11.2024	ကျိုတိုင်ကုန်းတောင်ရွာ	ဆွမ်းဆန်စိမ်းလောင်းလှူခြင်း		

##### Photo Records of CSR Activities







## 5. Records for GRM

### Monitoring Records for GRM

Monthly Record					
Date	Place	Activity	Organization Or Individual	Action Plan	Recorded by
August,2024	Great Success Energy Plant	-	-	-	U <a href="#"><u>Kyaw Zin Htet</u></a>
September,2024	Great Success Energy Plant	-	-	-	U <a href="#"><u>Kyaw Zin Htet</u></a>
Ocober,2024	Great Success Energy Plant	-	-	-	U <a href="#"><u>Kyaw Zin Htet</u></a>
November,2024	Great Success Energy Plant	-	-	-	U <a href="#"><u>Kyaw Zin Htet</u></a>

### GRM Organization of Thazi Solar Power Project Site

မကျေလည်မှုများ ဖြေရှင်းရေး ကော်မတီ			
စဉ်	အမည်	တာဝန်	ဌာန
၁	ဦးစိုးဝင်းဦး	ဥက္ကဋ္ဌ	
၂	ဦးရှုခိုင်	အတွင်းရေးမှူး	GSE Co., Ltd
၃	ဦးနိုင်လင်း	အဖွဲ့ဝင် (၁)	ကျိုတိုင်ကုန်းကျေးရွာ
၄	ဦးဆယ်ကြည်	အဖွဲ့ဝင် (၂)	ရွာပုလဲကြီးကျေးရွာ
၅	ဦးသန်းစိုးအောင်	အဖွဲ့ဝင် (၃)	GSE Co., Ltd




## 6. Records for Waste Disposal

Date	Place	Type	Amount	Inspected By
15.9.2024	<u>ဝန်ထမ်းလိုင်းများ / ရုံး</u>	<u>အမှိုက်စို / အမှိုက်ခြောက်</u>	48 Kg	U Sai Bo Bo
31.9.2024	<u>ဝန်ထမ်းလိုင်းများ / ရုံး</u>	<u>အမှိုက်စို / အမှိုက်ခြောက်</u>	43 Kg	U Sai Bo Bo
15.10.2024	<u>ဝန်ထမ်းလိုင်းများ / ရုံး</u>	<u>အမှိုက်စို / အမှိုက်ခြောက်</u>	50 Kg	U Sai Bo Bo
31.10.2024	<u>ဝန်ထမ်းလိုင်းများ / ရုံး</u>	<u>အမှိုက်စို / အမှိုက်ခြောက်</u>	52 Kg	U Sai Bo Bo
15.11.2024	<u>ဝန်ထမ်းလိုင်းများ / ရုံး</u>	<u>အမှိုက်စို / အမှိုက်ခြောက်</u>	44 Kg	U Sai Bo Bo
30.11.2024	<u>ဝန်ထမ်းလိုင်းများ / ရုံး</u>	<u>အမှိုက်စို / အမှိုက်ခြောက်</u>	41 Kg	U Sai Bo Bo
15.12.2024	<u>ဝန်ထမ်းလိုင်းများ / ရုံး</u>	<u>အမှိုက်စို / အမှိုက်ခြောက်</u>	40 Kg	U Sai Bo Bo
31.12.2024	<u>ဝန်ထမ်းလိုင်းများ / ရုံး</u>	<u>အမှိုက်စို / အမှိုက်ခြောက်</u>	41 Kg	U Sai Bo Bo

### Records for Waste Disposal




## Appendix 1 (Water Results)

		Myanmar Innovation Group of Co., Ltd Address : No. (9), Sabae Housing, Pyi Htaung Su Road, (26) Ward, South Dagon Tsp, Yangon, Myanmar. Tel : 09-893 767 424 E-mail : info@prolabmyanmar.com			
<b>LABORATORY ANALYSIS REPORT</b>					
1	Client Name	: Thazi Substation Solar Power Project			
2	Location	: Thazi			
3	Type of Sample	: Ground Water			
4	Sample No.	: 00057/2025			
5	Contact Person	: Eguard Environmental Services			
6	Phone No.	: 09-797005212			
7	Date Received	: 15.01.2025			
8	Date of Test Performed	: 15.01.2025			
9	Date of Issued	: 24.01.2025			
10	Result	:			
No.	Parameter	Result	Unit	WHO STD 2018	Method
1	Oil and Grease	3	mg/L	NA	<sup>(a)</sup> 5520D, Soxhlet Extraction Method
2	Total Coliform	< 0.3	MPN/ml	ND per 100 mL	FDA-BAM: MPN Method

**Remark:**  
**This certificate is issued only for the receipt of the test sample.**  
<sup>(a)</sup> American Public Health Association, Standard Methods for the Examination of Water and Wastewater.

<b>Tested By</b> Name : NAW EH THA KU Position : Laboratory Technician Signature : ..... <i>eh</i> .....	<b>Approved By</b> Name : THEMAR WINT Position : Laboratory Manager Signature : ..... <i>tw</i> .....
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LAB-FO-024-00

**LABORATORY ANALYSIS REPORT**

- 1 Client Name : Thazi Substation Solar Power Project
- 2 Location : Thazi
- 3 Type of Sample : Waste Water
- 4 Sample No. : 00058/2025
- 5 Contact Person : Eguard Environmental Services
- 6 Phone No. : 09-797005212
- 7 Date Received : 15.01.2025
- 8 Date of Test Performed : 15.01.2025
- 9 Date of Issued : 24.01.2025
- 10 Result :

No.	Parameter	Result	Unit	WHO STD 2018	Method
1	Oil and Grease	4	mg/L	-	<sup>(a)</sup> 5520D, Soxhlet Extraction Method
2	Total Coliform	4.3	MPN/ml	-	FDA-BAM: MPN Method

**Remark:**

**This certificate is issued only for the receipt of the test sample.**

**Dispose treated waste water according to state and local regulations.**

<sup>(a)</sup> American Public Health Association, Standard Methods for the Examination of Water and Wastewater.

**Tested By**

Name : NAW EH THA KU  
Position : Laboratory Technician  
Signature : .....*eh*.....

**Approved By**

Name : THEMAR WINT  
Position : Laboratory Manager  
Signature : .....*tw*.....





The Government of the Republic of the Union of Myanmar  
 Ministry of Natural Resources and Environmental Conservation  
 Department of Forest  
 Forest Research Institute  
 Water Quality Laboratory, Yezin



Ref: WQL/0005/2025

Date: 18-1-2025

**ANALYTICAL TEST REPORT**

Project Name: **Thazi Substation Solar Power Project**

Customer Address: **U Ye Chit Zaw**

Assignment number	2025 - 2 - 1	Sampling Location	Thazi
Sample name	GW	Sampling Date	-
Sample type	<b>Ground Water</b>	Sample received date	13-1-2025
Comments			

Parameter	Result	Unit	Method reference	Instruments
BOD	0.73	mg/L	Potentiometric	YSI Pro DO Tester
COD	2	mg/L	Titrimetric	Titration
Potassium	<0.02	mg/L	ISO 10304-1: 2009	Ion Chromatography (Thermo Scientific, DIONEX AQUION)
Total Suspended Solid	111	mg/L	NS 4733:1983/NS-EU 872:2005	Circulation and Filtration System
Total Phosphorus	19.43	ug/L	NS 4725	SFA(SKALAR SAN plus Analyzer) SA 3000/5000, SA 1100
Total Nitrogen	0.84	mg/L	Kjeldahl Method	Kjeldahl Digestion and Distillation Unit

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature:

Name: Dr. Thida Cho  
Assistant Research Officer

Approved by

Signature :

Name : Dr. Thida Swe  
Assistant Research Officer





The Government of the Republic of the Union of Myanmar  
 Ministry of Natural Resources and Environmental Conservation  
 Department of Forest  
 Forest Research Institute  
 Water Quality Laboratory, Yezin



Ref: WQL/0006/2025

Date: 18-1-2025

**ANALYTICAL TEST REPORT**

Project Name: **Thazi Substation Solar Power Project**

Customer Address: **U Ye Chit Zaw**

Assignment number	2025 - 2 - 2	Sampling Location	Thazi
Sample name	WW	Sampling Date	-
Sample type	<b>Waste Water</b>	Sample received date	13-1-2025
Comments			

Parameter	Result	Unit	Method reference	Instruments
BOD	1.6	mg/L	Potentiometric	YSI Pro DO Tester
COD	6	mg/L	Titrimetric	Titration
pH	8.66	-	ISO 10523:2008	ManTech Robot (PC-1300-475E)
Total Suspended Solid	6	mg/L	NS 4733:1983/NS-EU 872:2005	Circulation and Filtration System
Total Phosphorus	164.38	ug/L	NS 4725	SFA(SKALAR SAN plus Analyzer) SA 3000/5000,SA 1100
Total Nitrogen	2.25	mg/L	Kjeldahl Method	Kjeldahl Digestion and Distillation Unit

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature:

Name: Dr. Thida Cho  
 Assistant Research Officer

Approved by

Signature:

Name: Dr. Thida Swe  
 Assistant Research Officer