Environmental Monitoring Report

For

30 MW Ground Mounted Solar Power Plant Project Connected to Thapyaywa Substation

(Operation Phase)

(2nd Time)

(April 2023 – September 2023)

Proposed by

Clean Power Energy Co., Ltd.

Prepared by

E Guard Environmental Services

October, 2023

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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

Ambient Air Quality (1 location)	
Gas Emission	CO, CO_2, SO_2, NO_2
Dust Emission	PM_{10}, $PM_{2.5}$

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

Noise monitoring (2 locations)	
Noise Emission	LAeq (dBA) (1hrs, 24 hrs.)

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

Davis Vantage Pro2 Wireless Weather Station 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 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.	
Haz-Scanner EPAS PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO, CO_2, Temperature, and Relative Humidity	
Digital Sound Level Meter Noise	

Figure 1. 1 Air Quality Measuring during Operation Period

	Air, Noise quality measuring at Thapyaywa Solar Power Project 27.08.2023 to 28.08.2023 (at source project site)

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

Waste Water Parameters (1 location)	
Physical Parameter	Total Suspended Solids
Chemical Parameter	BOD, COD, pH
Biological Parameter	Total Coliform Bacteria
Nutrients	Total Nitrogen, Total Phosphorus
Compounds	Oil & grease
Ground Water Parameters (1 location)	
Physical Parameter	Total Suspended Solids, Color, Turbidity
Chemical Parameter	BOD, COD, pH, EC, Total Alkalinity
Biological Parameter	Total Coliform Bacteria
Metal	Iron, Manganese
Nutrients	Total Nitrogen, Total Phosphorus, Chloride
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

Water Sampling Bottle	

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 cannel 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 (Thapyaywa solar power project site (source) that can get results of the existing ambient air quality.

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

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

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

Table 1. 6 Locations of Environmental Quality sampling points

Locations No.	Points	Coordinate	Locations
Ambient Air Quality Monitoring Location			
1.	AQ1	Lat - 20°58'30.73"N, Long - 96° 0'34.17"E	Project Site
Noise Quality Monitoring Locations			
1.	NQ1	Lat - 20°58'30.73"N, Long - 96° 0'34.17"E	Project Site
2.	NQ2	Lat - 20°58'36.06"N, Long - 96° 0'45.24"E	Project Site (Receptor)
Waste Water Quality Monitoring Location			
1.	WWQ	Lat - 20°58'29.10"N, Long - 96° 0'34.42"E	Outlet of waste water cannel from the project site
Ground Water Quality Sampling Location			
1.	GWQ	Lat - 20°58'35.36"N, Long - 96° 0'45.74"E	Project Site

2. ENVIRONMENTAL QUALITY

2.1 Ambient Air Quality

The air quality monitoring was done at selected locations during 27th to 28th August 2023. During this survey, these parameters were measured with adequate devices named Environmental Perimeter Air Station (EPAS) viz; Particulate Matters (PM_{10} and $PM_{2.5}$) and gases CO_2, CO, SO_2, NO_2 via 24-hour basis. The results and guidelines of all emission pollutants are shown in table.

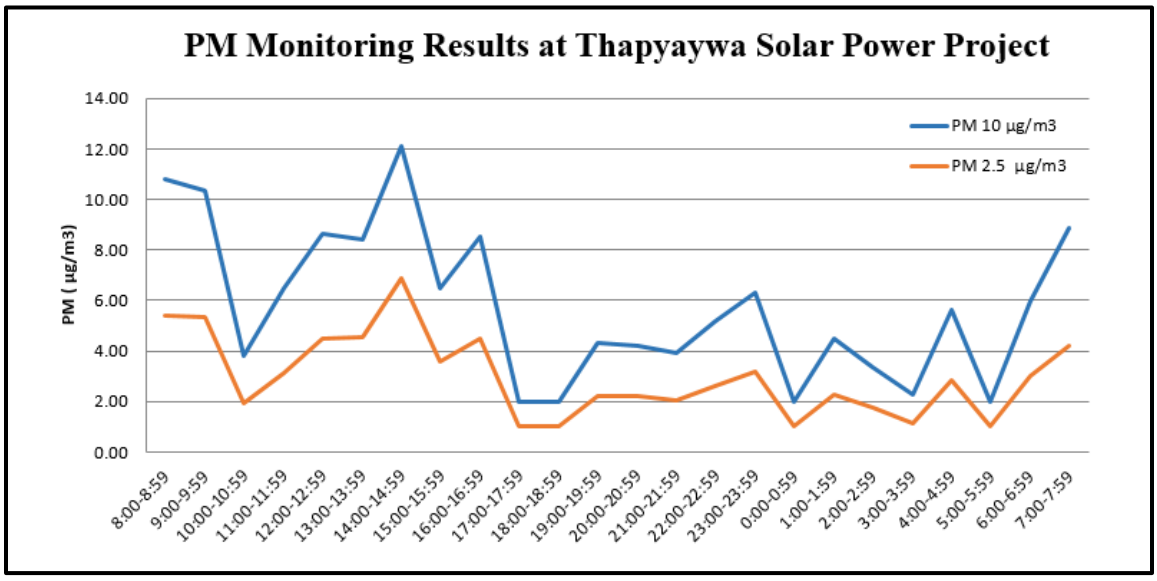


Figure 2. 1 PM Monitoring Results at Thapyaywa Solar Power Project

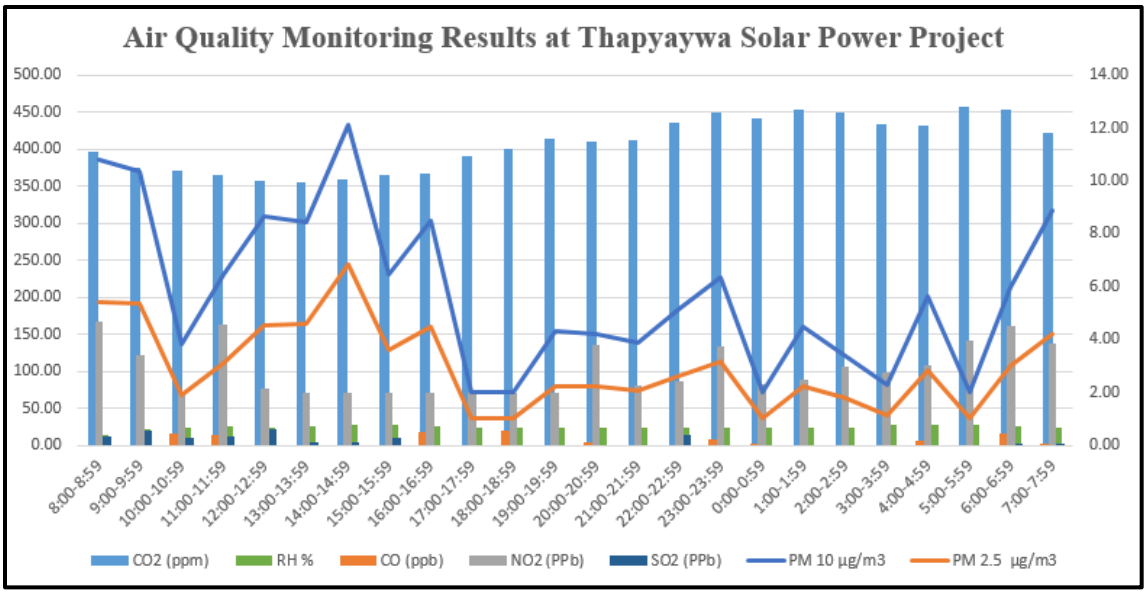


Figure 2. 2 Fluctuation of Air Pollutants during Dial Cycle at Thapyaywa Solar Power Project

Particulate matters (PM_{10} and $PM_{2.5}$) results are with in guideline values as shown in table. Atmospheric particulate matters such as PM_{10} and $PM_{2.5}$ 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_2) 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_2. SO_2 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_X) in the ambient air consist of nitric oxide (NO), nitrogen dioxide (NO_2) and nitrous oxide (N_2O). NO_2 is formed by chemical reaction of NO and ozone. The main sources of NO_2 are combustion of fuel and on-road and off-road vehicles. NO_2 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_2 reduction.

Likewise, **Carbon Monoxide (CO) and Carbon dioxide (CO_2)** have the same emission sources and mitigation measures for SO_2 and NO_2. They are poisonous gas and cause damage to the respiratory organ. Guidelines 2013, adopted threshold limit values of CO_2 is 5,000 ppm for 8-

hour, time-weighted average. Thus, it can be concluded that the existing CO_2 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 (Thapyaywa Solar Power Project)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
27.08.2023	8:00-8:59	Average	395.50	0.00	4.70	10.82	5.42	14.80	0.33
27.08.2023	9:00-9:59	Average	373.98	0.00	3.40	10.37	5.37	21.08	0.57
27.08.2023	10:00-10:59	Average	370.18	0.43	2.00	3.83	1.92	23.88	0.30
27.08.2023	11:00-11:59	Average	365.30	0.40	4.58	6.47	3.13	24.83	0.33
27.08.2023	12:00-12:59	Average	356.68	0.00	2.17	8.65	4.52	24.33	0.62
27.08.2023	13:00-13:59	Average	355.63	0.00	2.00	8.43	4.57	25.93	0.12
27.08.2023	14:00-14:59	Average	359.13	0.00	2.00	12.13	6.87	27.00	0.13
27.08.2023	15:00-15:59	Average	364.72	0.00	2.00	6.47	3.58	26.93	0.27
27.08.2023	16:00-16:59	Average	366.28	0.52	2.00	8.52	4.47	25.70	0.00
27.08.2023	17:00-17:59	Average	391.42	0.00	2.00	2.00	1.00	23.90	0.00
27.08.2023	18:00-18:59	Average	401.13	0.55	2.00	2.00	1.00	23.00	0.00
27.08.2023	19:00-19:59	Average	413.35	0.00	2.00	4.30	2.23	23.00	0.00
27.08.2023	20:00-20:59	Average	410.17	0.13	3.82	4.20	2.22	23.00	0.00
27.08.2023	21:00-21:59	Average	411.13	0.00	2.23	3.90	2.05	23.00	0.00
27.08.2023	22:00-22:59	Average	435.68	0.00	2.40	5.15	2.62	23.00	0.37
27.08.2023	23:00-23:59	Average	448.97	0.20	3.77	6.33	3.17	23.00	0.00
28.08.2023	0:00-0:59	Average	440.82	0.08	2.32	2.00	1.00	23.00	0.00
28.08.2023	1:00-1:59	Average	453.62	0.00	2.48	4.48	2.25	23.00	0.00
28.08.2023	2:00-2:59	Average	449.92	0.00	2.98	3.37	1.78	23.00	0.00
28.08.2023	3:00-3:59	Average	433.77	0.00	2.73	2.27	1.13	26.63	0.00
28.08.2023	4:00-4:59	Average	430.85	0.17	3.03	5.63	2.82	28.07	0.00
28.08.2023	5:00-5:59	Average	457.53	0.00	3.97	2.00	1.00	27.65	0.00
28.08.2023	6:00-6:59	Average	453.23	0.43	4.48	5.98	3.02	25.45	0.03
28.08.2023	7:00-7:59	Average	421.35	0.05	3.85	8.88	4.20	23.00	0.03
Average			406.68	0.12	2.87	5.76	2.97	24.01	0.13
1 hour Minimum			355.63	0.00	2.00	2.00	1.00	14.80	0.00
1 hour Maximum			457.53	0.55	4.70	12.13	6.87	28.07	0.62

Table 2. 2 Air Emission Levels (Standard)

No.	Parameter	Unit	Maximum Concentration	
			National	Average Period
1.	Carbon monoxide	mg/m^3	9	8-hour
2.	Carbon dioxide	ppm	5000	8-hour
3.	Sulfur dioxide	$\mu g/m^3$	20 500	24-hour 10-minute
4.	Nitrogen dioxide	$\mu g/m^3$	40 200	1 year 1 hour
5.	Particulate matter PM_{10}	$\mu g/m^3$	20 50	1-year 24-hour
6.	Particulate matter $PM_{2.5}$	$\mu g/m^3$	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	1st Monitoring Results	Baseline Results	NEQG Guidelines Value	ACGIH Guidelines Value	NAAQS Guidelines Value	Unit	Averaging Period
PM_{10}	4.69	4.84	27.11	50	-	-	$\mu g/m^3$	24hrs
$PM_{2.5}$	2.46	2.58	9.00	25	-	-	$\mu g/m^3$	24hrs
CO	0.00069	0.00019	0.01	-	-	9	ppm	8hrs
CO_2	442.64	445.87	496.32	-	5000	-	ppm	8hrs
SO_2	0.65	0.093	3.92	20	-	-	$\mu g/m^3$	24hrs
NO_2	15.29	5.45	58.97	200	-	-	$\mu g/m^3$	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 Thapyaywa solar power project points: these points are nearly the air monitoring points and staff housing on 27th to 28th August 2023. 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 Thapyaywa Solar Project Site (Source)

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	28.08.2023	7:00:13-7:59:13	46.91	A	Day	
2	27.08.2023	8:00:13-8:59:13	48.80	A	Day	
3	27.08.2023	9:00:13-9:59:13	42.07	A	Day	
4	27.08.2023	10:00:13-10:59:13	47.93	A	Day	
5	27.08.2023	11:00:13-11:59:13	49.79	A	Day	
6	27.08.2023	12:00:13-12:59:13	50.30	A	Day	
7	27.08.2023	13:00:13-13:59:13	49.36	A	Day	
8	27.08.2023	14:00:13-14:59:13	48.94	A	Day	48.37
9	27.08.2023	15:00:13-15:59:13	49.52	A	Day	
10	27.08.2023	16:00:13-16:59:13	49.39	A	Day	
11	27.08.2023	17:00:13-17:59:13	49.05	A	Day	
12	27.08.2023	18:00:13-18:59:13	49.21	A	Day	
13	27.08.2023	19:00:13-19:59:13	49.13	A	Day	
14	27.08.2023	20:00:13-20:59:13	47.72	A	Day	
15	27.08.2023	21:00:13-21:59:13	47.49	A	Day	
16	27.08.2023	22:00:13-22:59:13	49.61	A	Night	
17	27.08.2023	23:00:13-23:59:13	52.52	A	Night	
18	28.08.2023	0:00:13-0:59:13	58.24	A	Night	
19	28.08.2023	1:00:13-1:59:13	53.25	A	Night	
20	28.08.2023	2:00:13-2:59:13	48.29	A	Night	51.15
21	28.08.2023	3:00:13-3:59:13	47.36	A	Night	
22	28.08.2023	4:00:13-4:59:13	47.71	A	Night	
23	28.08.2023	5:00:13-5:59:13	50.85	A	Night	
24	28.08.2023	6:00:13-6:59:13	52.55	A	Night	
Average			**49.42**			

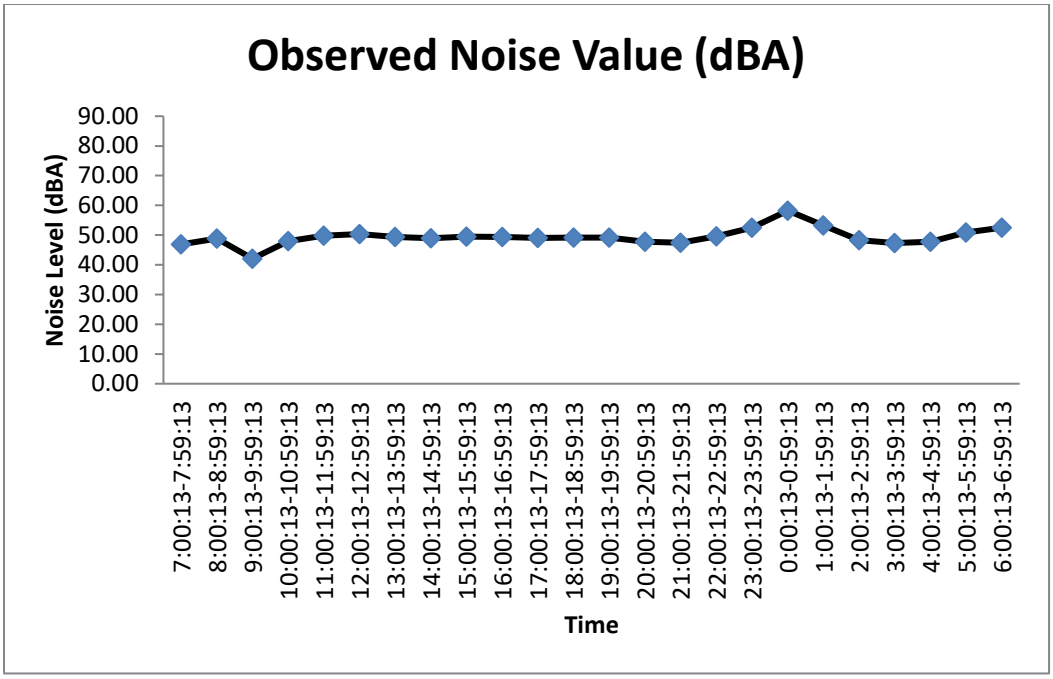


Figure 2. 3 Noise Level at Thapyaywa Solar Project Site (Source)

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	28.08.2023	7:00:13-7:59:13	40.24	A	Day	47.06
2	27.08.2023	8:00:13-8:59:13	46.22	A	Day	
3	27.08.2023	9:00:13-9:59:13	52.62	A	Day	
4	27.08.2023	10:00:13-10:59:13	43.24	A	Day	
5	27.08.2023	11:00:13-11:59:13	47.16	A	Day	
6	27.08.2023	12:00:13-12:59:13	46.64	A	Day	
7	27.08.2023	13:00:13-13:59:13	45.99	A	Day	
8	27.08.2023	14:00:13-14:59:13	45.85	A	Day	
9	27.08.2023	15:00:13-15:59:13	48.47	A	Day	
10	27.08.2023	16:00:13-16:59:13	44.37	A	Day	
11	27.08.2023	17:00:13-17:59:13	49.94	A	Day	
12	27.08.2023	18:00:13-18:59:13	57.70	A	Day	
13	27.08.2023	19:00:13-19:59:13	46.22	A	Day	
14	27.08.2023	20:00:13-20:59:13	45.27	A	Day	
15	27.08.2023	21:00:13-21:59:13	45.96	A	Day	
16	27.08.2023	22:00:13-22:59:13	41.46	A	Night	36.60
17	27.08.2023	23:00:13-23:59:13	35.65	A	Night	
18	28.08.2023	0:00:13-0:59:13	36.38	A	Night	

19	28.08.2023	1:00:13-1:59:13	37.04	A	Night	
20	28.08.2023	2:00:13-2:59:13	36.32	A	Night	
21	28.08.2023	3:00:13-3:59:13	33.84	A	Night	
22	28.08.2023	4:00:13-4:59:13	36.07	A	Night	
23	28.08.2023	5:00:13-5:59:13	34.95	A	Night	
24	28.08.2023	6:00:13-6:59:13	37.70	A	Night	
Average			**43.14**			

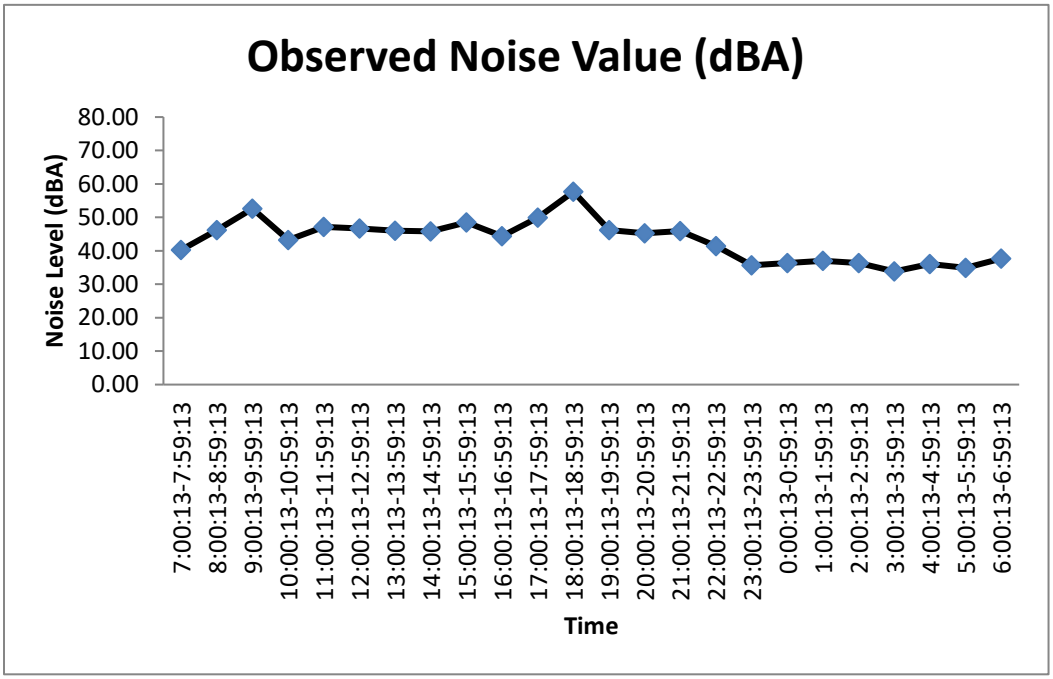


Figure 2. 4 Noise Level at Staff Housing (Receptor)

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

Point	**Thapyaywa Solar Power Project**	
	Day Time	Night Time
Project Site (Source)	**48.37**	**51.15**
1st Monitoring Results	**48.71**	**50.22**
Baseline Results	**49.11**	**42.40**
Guideline Values for Industrial	**70**	**70**
Staff Housing (Receptor)	**47.06**	**36.60**

1st Monitoring Results	**46.72**	**37.43**
Baseline Results	**40.20**	**43.08**
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 Thapyaywa Solar Power Project Site (source) and Staff Housing (Receptor) are 48.37 dB (A) and 47.06 dB (A). The observed values of the proposed project for nighttime at Thapyaywa Solar Power Project Site (source) and Staff Housing (Receptor) are 51.15 dB (A) and 36.60 dB (A). The observed daytime value and night time value for Thapyaywa 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 (Thapyaywa Solar Power Project Site at source) on 27th to 28th August 2023 respectively. According to the data, the wind direction is following **Figure 2. 5** and **Figure 2. 6**.

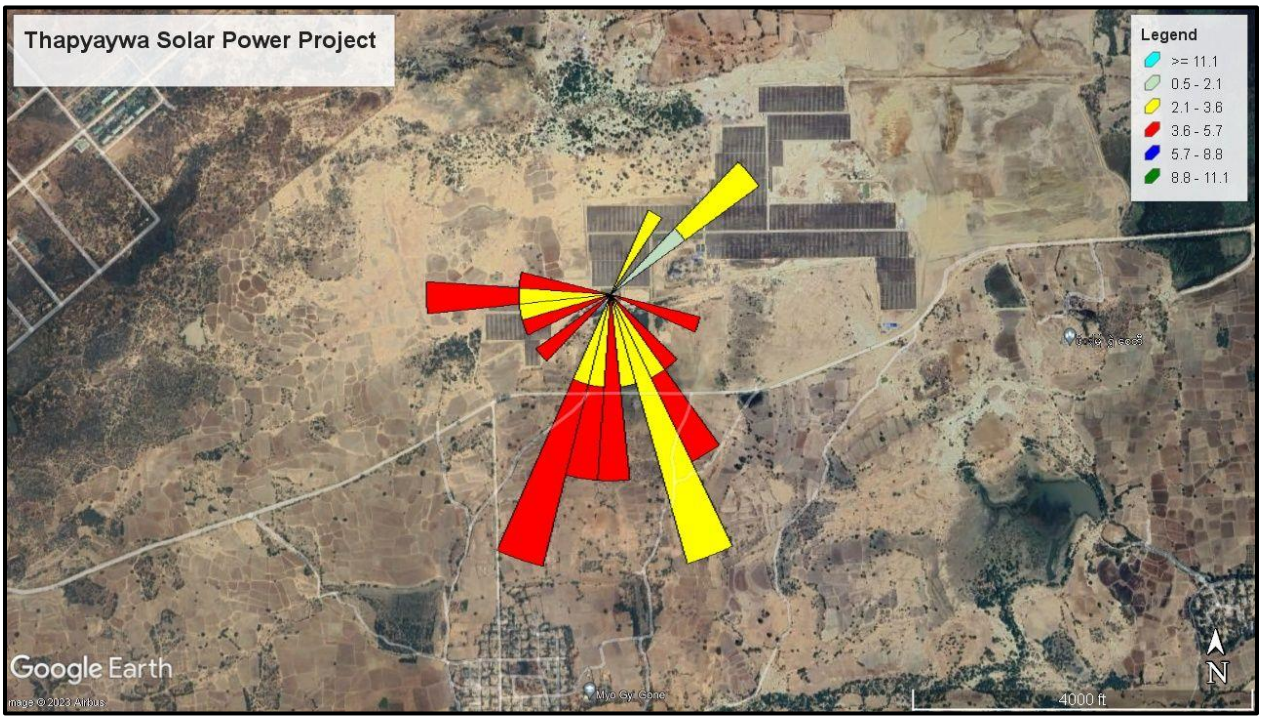


Figure 2. 5 Wind Speed and Wind Direction (Blowing From) at Thapyaywa Solar Power Project Site

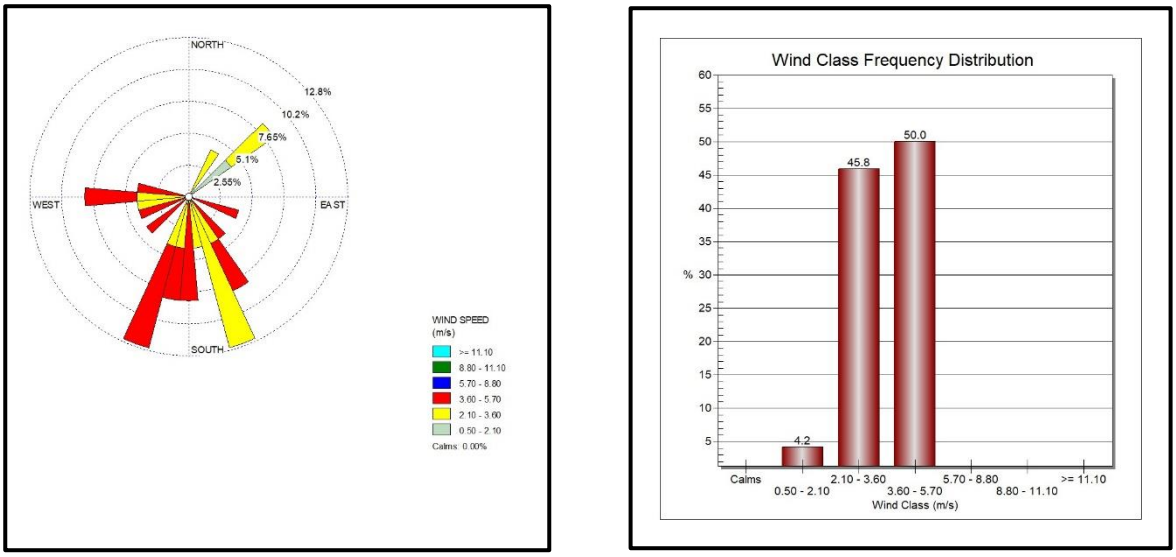


Figure 2. 6 Wind Class Frequency Distribution at the Thapyaywa Solar Power Project Site

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 10th January 2023. The field surveys for monthly sampling were done on 24th April 2023, 31th May 2023, 1st August 2023, 27th August 2023 and 26th September 2023.

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 Thapyaywa Solar Power Project

Item	Unit	Ground Water	1st Monitoring Results	Baseline Results	WHO Drinking Water Guideline
Biological Oxygen Demand (BOD)	mg/l	0.55	1.39	6	-
Chemical Oxygen Demand (COD)	mg/l	1.10	4.4	32	-
Color	PCU	58	Nil	-	-
Chloride	mg/l	19.23	6.85	-	-
Electrical Conductivity	mS/m	103.32	101.1	1.39	-
pH	-	8.43	7.63	7.36	6.5-8.5
Oil & Grease	mg/l	10	3	<5	-
Turbidity	FNU	42	0.34	5.3	-
Total Alkalinity	mmol/l	8.24	8.65	-	-
Total Nitrogen	mg/l	0.68	0.56	0.84	-
Total Phosphorus	mg/l	0.019	0.022	0.012	-
Total suspended solid (TSS)	mg/l	0.33	0.25	28	-
Total coliform bacteria	MPN/ml	9.3	<0.3	4.5	Not detected
Iron	mg/l	1.66	0.02	-	-
Manganese	mg/l	0.064	<0.006	-	-

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

Item	Unit	Waste Water	1st Monitoring Results	National Environmental Quality (Emission) Guideline for Electric Power Transmission and Distribution

Biological Oxygen Demand (BOD)	mg/l	0.57	5.94	30
Chemical Oxygen Demand (COD)	mg/l	1.12	6.85	125
pH	-	8.36	8.17	6-9
Total Nitrogen	mg/l	0.48	0.28	10
Total Phosphorus	mg/l	0.025	0.027	2
Oil and Grease	mg/l	9	5	10
Total suspended solid (TSS)	mg/l	0.4	40	50
Total coliform bacteria	CFU/100 ml	4.3	9.3	400

Table 2. 10 Monthly Waste Water Quality of Thapyaywa Solar Power Project (April)

Item	Unit	Waste Water	National Environmental Quality (Emission) Guideline for Electric Power Transmission and Distribution
Electrical Conductivity	mS/m	109.77	-
pH	-	8.71	6-9
Temperature	℃	30.25	-
Total Dissolved Solids	mg/l	679	-

Table 2. 11 Monthly Waste Water Quality of Thapyaywa Solar Power Project (May)

Item	Unit	Waste Water	National Environmental Quality (Emission) Guideline for Electric Power Transmission and Distribution
Electrical Conductivity	mS/m	105.03	-
pH	-	8.02	6-9
Temperature	℃	28.93	-
Total Dissolved Solids	mg/l	679	-

Table 2. 12 Monthly Waste Water Quality of Thapyaywa Solar Power Project (June)

Item	Unit	Waste Water	National Environmental Quality (Emission) Guideline for Electric Power Transmission and Distribution
Electrical Conductivity	mS/m	113.49	-
pH	-	8.99	6-9
Temperature	℃	29.11	-
Total Dissolved Solids	mg/l	755	-

Table 2. 13 Monthly Waste Water Quality of Thapyaywa Solar Power Project (July)

Item	Unit	Waste Water	National Environmental Quality (Emission) Guideline for Electric Power Transmission and Distribution
Electrical Conductivity	mS/m	109.82	-
pH	-	8.69	6-9
Temperature	℃	29	-
Total Dissolved Solids	mg/l	679	-

Table 2. 14 Monthly Waste Water Quality of Thapyaywa Solar Power Project (August)

Item	Unit	Waste Water	National Environmental Quality (Emission) Guideline for Electric Power Transmission and Distribution
Electrical Conductivity	mS/m	94.51	-
pH	-	8.40	6-9
Temperature	℃	26.63	-
Total Dissolved Solids	mg/l	542	-

Table 2. 15 Monthly Waste Water Quality of Thapyaywa Solar Power Project (September)

Item	Unit	Waste Water	National Environmental Quality (Emission) Guideline for Electric Power Transmission and Distribution
Electrical Conductivity	mS/m	110.17	-
pH	-	8.79	6-9
Temperature	℃	26.74	-
Total Dissolved Solids	mg/l	607	-

Photo Record for Water Quality Sampling

	WWQ 1 (outlet from the project site)
	GWQ (from the project site)

3. ENVIRONMENTAL MONITORING PLAN

3.1 Monitoring Records for Safety Plan

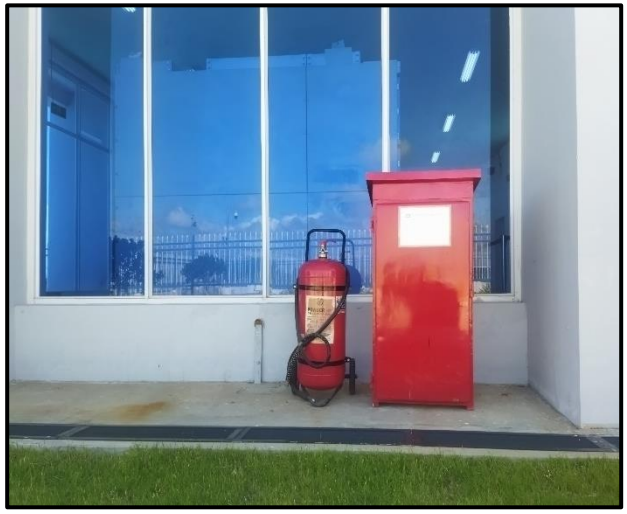
Monitoring Record for Safety Plan

Monthly Record					
Date	**Place**	**Activity**	**Organization**	**Number of Attendees**	**Remark**
April ,2023	PV Field	Hazard and Safety Training	Thapyaywa Solar Power Plant	25	
May,2023	Working Area	Aware Training About PPE	Thapyaywa Solar Power Plant	30	
June,2023	Power Station	Fire Safety Training	Thapyaywa Solar Power Plant	75	
July,2023	Working Area	Electrical Safety Training	Thapyaywa Solar Power Plant	25	
Aygust,2023	Power Station	Provide PPE Safety Equipment	Thapyaywa Solar Power Plant	35	
September-2023	Office Meeting Room	Health Care	Thapyaywa Solar Power Plant	75	
April ,2023	Working Area	Electrical Safety Training	Thapyaywa Solar Power Plant	35	
May,2023	PV Field	Hazard and Safety Training	Thapyaywa Solar Power Plant	30	
June,2023	Working Area	Aware Training About PPE	Thapyaywa Solar Power Plant	25	
July,2023	Power Station	Fire Safety Training	Thapyaywa Solar Power Plant	75	
Aygust,2023	Working Area	Electrical Safety Training	Thapyaywa Solar Power Plant	35	
September,2023	Office Meeting Room	Health Care	Thapyaywa Solar Power Plant	75	

Monitoring Record for Occupational Safety Equipment

Date	Place	Type	Quality	Remark	Inspected By	Supervisor
30-August-2023	Store	Safety Shoe	23		U Shein Min Htet	U Toe Toe
30-August-2023	Store	Safety Helment	23		U Shein Min Htet	U Toe Toe
30-August-2023	Store	Safety Gloves	23		U Shein Min Htet	U Toe Toe
30-August-2023	Store	Safety Belt	23		U Shein Min Htet	U Toe Toe

Records of Health and Safety Plan Activities



Emergency Contact List Attached in the Project Site

အရေးပေါ်အခြေအနေတုန့်ပြန်မှုအခြေအနေ စီမံကိန်းလုပ်ငန်းအတွင်းမှ အရေးကြီးဆက်သွယ်ရမည့် ဖုန်းနံပါတ်များ			
စဉ်	အမည်	ရာထူး	ဖုန်းနံပါတ်
၁	ဦးစည်သူဖြိုးဆွေ	စက်ရုံမှူး	09-777464775
၂	ဦးစိုင်းဘိုဘို	ဒုစက်ရုံမှူး	09-420732352
၃	ဦးရှိန်းမင်းထက်	အန္တရာယ်ကင်းရှင်းရေးအရာရှိ	09-791635193
၄	ဦးတိုးတို့	ကြီးကြပ်ရေးမှူး	09-978876757
၅	ဦးဝင်းမြင့်ထွန်း	ရှေးဦးသူနာပြု	09-400476694
၆	ဦးသန်းဝင်းဇိုင်	အရေးပေါ်အခြေအနေထိန်းချုပ်ရေးမှူး	09-766785118

အရေးကြီးဆက်သွယ်ရမည့် ဒေသတွင်းဖုန်းနံပါတ်များ			
စဉ်	အမည်/ဌာ	အကြောင်းအရာ	ဖုန်းနံပါတ်
၁	မြို့နယ်မီးသတ်ဦးစီးဌာန	မီးလောင်ခြင်းအတွက်	09-402665664
၂	တိုက်နယ်ရဲစခန်း	လုံခြုံရေးကိစ္စရပ်များအတွက်	09-450337701
၃	အနီးဆုံးတိုက်နယ်ဆေးရုံ	ထိခိုက်ဒဏ်ရာရရှိသူများအတွက်	09-449872690
၄	မြို့နယ်လျှပ်စစ်ဌာန	လျှပ်စစ်မီးကိစ္စ	09-256592220
၅	မြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာ	အထွေထွေအုပ်ချုပ်ရေးကိစ္စ	

Fire Extinguisher Check List

No	Date	Description	Location	Number	Unit
1	1-4-2023	Fire Extinguisher(50) kg	Power Station	1	Nos
2	1-4-2023	Fire Extinguisher(10) kg	Power Station	3	Nos
3	1-4-2023	Fire Extinguisher(10) kg	Briefing Hall	3	Nos
4	1-4-2023	Fire Extinguisher(5) kg	Office	2	Nos
5	1-4-2023	Fire Extinguisher(5) kg	6 Unit (1)	2	Nos
6	1-4-2023	Fire Extinguisher(5) kg	6 Unit (2)	2	Nos
7	1-4-2023	Fire Extinguisher(5) kg	6 Unit (3)	2	Nos
8	1-4-2023	Fire Extinguisher(5) kg	6 Unit (4)	2	Nos
9	1-4-2023	Fire Extinguisher(5) kg	Staff Housing	2	Nos
10	1-4-2023	Fire Extinguisher(5) kg	Store	3	Nos
11	1-4-2023	Fire Extinguisher(5) kg	Messing	2	Nos
12	1-4-2023	Fire Extinguisher(5) kg	Main Gate	2	Nos
13	1-4-2023	Fire Extinguisher(5) kg	Power Station Gate	2	Nos
14	1-4-2023	Fire Extinguisher(5) kg	East Gate	2	Nos
15	1-4-2023	Fire Extinguisher(5) kg	Kitchen Room	2	Nos
16	1-4-2023	Fire Extinguisher(5) kg	Tower (1)	2	Nos
17	1-4-2023	Fire Extinguisher(5) kg	Tower (2)	2	Nos
18	1-4-2023	Fire Extinguisher(5) kg	Tower(3)	2	Nos
19	1-4-2023	Fire Extinguisher(5) kg	Box X' mer 1	2	Nos
20	1-4-2023	Fire Extinguisher(5) kg	Box X' mer 2	2	Nos
21	1-4-2023	Fire Extinguisher(5) kg	Box X' mer 3	2	Nos
22	1-4-2023	Fire Extinguisher(5) kg	Box X' mer 4	2	Nos
23	1-4-2023	Fire Extinguisher(5) kg	Box X' mer 5	2	Nos

4. Records for CSR activities

Records for CSR Activities

Date	Place	Type	Amount (MMK) Activities	Received
17-7-2023	သာစည်မြို့	မြွေဆိပ်ဖြေဆေး (၁၂)လုံးလှူဒါန်းခြင်း		
30-7-2023	ဟံဝေမြို့	ဖိုးမြရွဲစေတီတွင် နဂါးရုံဘုရား အနေကဝေတင်ပွဲ ပြုလုပ်ခြင်း		
14-7-2023	ဝမ်းသာရွာ	ရွာအဝင်ဆိုင်းဘုတ်ပြုလုပ်ပေးခြင်း		
10-7-2023	ဝမ်းသာရွာ	သောက်သုံးရေကန် တူးဖော်လှူဒါန်းပေးခြင်း		
15-7-2023	ဝမ်းသာရွာ	ဘောလုံးကွင်း ဖောက်လုပ်ပေးခြင်း		
6-8-2023	ကျောင်း(၉)ကျောင်း	ဝါဆိုသင်္ကန်းကပ်လှူခြင်း		
17-8-2023	ဝက်တိုးရွာ	ရွာအဝင်ဆိုင်းဘုတ်ပြုလုပ်ပေးခြင်း		
11-6-2023	သာစည်မြို့	သစ်တောဦးစီးဌာနမှ ပျိုးပင်များသွားရောက် ယူဆောင်ခြင်း		
31-7-2023	မြို့ကြီးကုန်းရွာ	သစ်ပင်စိုက်ပျိုးပွဲတော် ကျင်းပပြုလုပ်ခြင်း		
1-9-2023	မြို့ကြီးကုန်းရွာ	အမှိုက်ကျင်းတူးပေးခြင်း/အမှိုက်များ ရှင်လင်းပေးခြင်း		
17-4-2023	CPE	ပျိုးခြံအတွင်း ပျိုးပင်များ ပျိုးထောင်ထားခြင်း		

Photo Records of CSR Activities

ကျန်းမာရေးဝန်ကြီးဌာန
မြို့နယ်ကူသရေဦးစီးဌာန
သာစည်မြို့၊

အလှူရှင်ကုမ္ပဏီတော်တမ်းလွှာ

- အလှူရှင်အမည် --Clean Power Energy Company
- နေရပ် --သခြေဝ ဆိုလာစက်ရုံ
- အလှူပစ္စည်း --ခမြဆိပ်ခြေစေး (၁၂) လုံး
- အလှူတော်ခွေ -- ကျပ်တိတိအား

စေတနာထက်သန်စွာလှူဒါန်းပူဇော်အား ပုတ်တမ်းတင်ဂုဏ်ပြုတော်မူပါသည်၊

ဒေါက်တာနိုင်းဇေယျာမျိုး
မြို့နယ်ကူသရေဦးစီးဌာနမှူး
သာစည်မြို့၊

ရက်စွဲ ၂၀၂၃ ခုနှစ် နိုဝင်ဘာ လ (၁၃) ရက်


ဝမ်းသာရွာမှ
ကြွဆိုပါ၏
CLEAN POWER
ENERGY.CO.LTD


သာဝည်မြို့နယ်ဝက်တိုးဘုံဝို့
ဝက်တိုးကျေးရွာမှကြို့ဆိုပါ၏
CLEAN POWER
ENERGY. CO.LTD


သစ်ပင်စိုက်ပါ တို့ကမ္ဘာ
သာယာလှပ စိမ်းမြမြ


SANY


SANY


အမှိုက် မပစ်ရ
အမှိုက်ကျင်းထဲသို့ သွားပစ်ရန်


အမှိုက်ကျင်းထဲသို့
ပွန်ပစ်ပါ

5. Records for GRM

Monitoring Records for GRM

Monthly Record					
Date	**Place**	**Issue**	**Organization Or Individual**	**Action Plan**	**Recorded by**
April,2023	Thapyaywa Solar Power Plant	-	-	-	U Si Thu Phyo Swe
May,2023	Thapyaywa Solar Power Plant	-	-	-	U Si Thu Phyo Swe
June,2023	Thapyaywa Solar Power Plant	-	-	-	U Si Thu Phyo Swe
July,2023	Thapyaywa Solar Power Plant	-	-	-	U Si Thu Phyo Swe
August,2023	Thapyaywa Solar Power Plant	-	-	-	U Si Thu Phyo Swe
September.2023	Thapyaywa Solar Power Plant	-	-	-	U Si Thu Phyo Swe

GRM Organization of Thapyaywa Solar Power Project Site

မကျေလည်မှုများ ဖြေရှင်းပေးရေးကော်မတီ			
စဉ်	အမည်	တာဝန်	ဌာန
၁	ဦးခင်မောင်တင့်	ဥက္ကဋ္ဌ	သပြေဝန္ထာ
၂	ဦးအောင်ကျော်ခိုင်	အတွင်းရေးမှူး	CPE Co.,Ltd
၃	ဦးမြင့်စိုး	အဖွဲ့ဝင်(၁)	သပြေဝန္ထာ
၄	ဦးချစ်ညို	အဖွဲ့ဝင်(၂)	သပြေဝန္ထာ
၅	ဦးပုတူး	အဖွဲ့ဝင်(၃)	CPE Co., Ltd

6. Records for Waste Disposal

Monthly Record				
Date	**Place**	**Type**	**Amount**	**Inspected by**
15-April,2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	100 Kg	U Shein Min Htet
30-April,2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	60 Kg	U Shein Min Htet
15-May.2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	75 Kg	U Shein Min Htet
30-May-2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	80 Kg	U Shein Min Htet
15-June,2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	50 Kg	U Shein Min Htet
30-June,2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	90 Kg	U Shein Min Htet
15-July,2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	55 Kg	U Shein Min Htet
30-July,2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	80 Kg	U Shein Min Htet
15-Aygust,2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	65 Kg	U Shein Min Htet
30-Aygust,2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	70 Kg	U Shein Min Htet
15-September,2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	100 Kg	U Shein Min Htet
30-September,2023	ဝန်ထမ်းလိုင်းများရုံး	အမှိုက်စို/အမှိုက်ခြောက်	60 Kg	U Shein Min Htet

Records for Waste Disposal


No Smoking

Appendix 1 (Water Results)

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/0137/2023
Date: 25-4-2023

ANALYTICAL TEST REPORT

Customer Name:Thapyaywa Solar Power Project
Customer Address :

Assignment number	WL/2023-45	Sampling Location	သာစည်
Sample number	1	Sampling Date	-
Sample type		Sample received date	25-4-2023
Comments			

Parameter	Result	Unit	Method reference	Instruments
pH	8.71	-	ISO 10523:2008	ManTech Robot (PC-1300-475E)
Conductivity	109.77	*mS/m*	NS-ISO 7888:1993	ManTech Conductivity, Model 4510 Conductivity/TDS meter
Total Dissolved Solids	679	*mg/L*	Manual	PROZOR® TDS&EC Test Meter
Water Temperature	30.25	℃	Potentiometric	HQ40d multi Field Tester

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

Water Quality Laboratory, Forest Research Institute, Yezin
No .....
Date .....

Ref : WQL/0154/2023
Date: 2-6-2023

ANALYTICAL TEST REPORT

Customer Name:Thapyaywa Solar Power Project
Customer Address :

Assignment number	WL/2023-53	Sampling Location	သာစည်
Sample number	1	Sampling Date	-
Sample type		Sample received date	1-6-2023
Comments			

Parameter	Result	Unit	Method reference	Instruments
pH	8.02	-	ISO 10523:2008	ManTech Robot (PC-1300-475E)
Conductivity	105.03	*mS/m*	NS-ISO 7888:1993	ManTech Conductivity, Model 4510 Conductivity/TDS meter
Total Dissolved Solids	679	*mg/L*	Manual	PROZOR® TDS&EC Test Meter
Water Temperature	28.93	℃	Potentiometric	HQ40d multi Field Tester

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

Water Quality Laboratory, Forest Research Institute, Yezin
No .....
Date .....

Ref : WQL/0186/2023
Date: 28-6-2023

ANALYTICAL TEST REPORT

Customer Name:**Thapyaywa Solar Power Project**

Customer Address :

Assignment number	WL/2023-59	Sampling Location	သာစည်
Sample number	1	Sampling Date	-
Sample type		Sample received date	28-6-2023
Comments			

Parameter	Result	Unit	Method reference	Instruments
pH	8.99	-	ISO 10523:2008	ManTech Robot (PC-1300-475E)
Conductivity	113.49	*mS/m*	NS-ISO 7888:1993	ManTech Conductivity, Model 4510 Conductivity/TDS meter
Total Dissolved Solids	755	*mg/L*	Manual	PROZOR® TDS&EC Test Meter
Water Temperature	29.11	*℃*	Potentiometric	HQ40d multi Field Tester

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/0226/2023
Date: 8-8-2023

ANALYTICAL TEST REPORT

Customer Name:**Thapyaywa Solar Power Project**

Customer Address :

Assignment number	WL/2023-74	Sampling Location	သာစည်
Sample number	1	Sampling Date	-
Sample type		Sample received date	2-8-2023
Comments			

Parameter	Result	Unit	Method reference	Instruments
pH	8.69	-	ISO 10523:2008	ManTech Robot (PC-1300-475E)
Conductivity	109.82	*mS/m*	NS-ISO 7888:1993	ManTech Conductivity, Model 4510 Conductivity/TDS meter
Total Dissolved Solids	679	*mg/L*	Manual	PROZOR® TDS&EC Test Meter
Water Temperature	29	℃	Potentiometric	HQ40d multi Field Tester

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

Water Quality Laboratory ★ Forest Research Institute, Yezin ★ No ..... Date .....

Ref : WQL/0249/2023
Date:18-9-2023

ANALYTICAL TEST REPORT

Customer Name:**Thapyaywa Solar Power Project**
Customer Address :

Assignment number	WL/2023-79	Sampling Location	
Sample number	2	Sampling Date	
Sample type	Waste Water(M)	Sample received date	27-8-2023
Comments			

Parameter	Result	Unit	Method reference	Instruments
pH	8.40	-	ISO 10523:2008	ManTech Robot (PC-1300-475E)
Conductivity	94.51	*mS/m*	NS-ISO 7888:1993	ManTech Conductivity, Model 4510 Conductivity/TDS meter
Total Dissolved Solids	542	*mg/L*	Manual	PROZOR® TDS&EC Test Meter
Water Temperature	26.63	℃	Potentiometric	ManTech Robot

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

Water Quality Laboratory ★ Forest Research Institute, Yezin ★ No ..... Date .....

Ref : WQL/0248/2023
Date:18-9-2023

ANALYTICAL TEST REPORT

Customer Name:**Thapyaywa Solar Power Project**
Customer Address :

Assignment number	WL/2023-79	Sampling Location	
Sample number	1	Sampling Date	
Sample type	Waste Water (Q)	Sample received date	27-8-2023
Comments			

Parameter	Result	Unit	Method reference	Instruments
pH	8.36	-	ISO 10523:2008	ManTech Robot (PC-1300-475E)
BOD	0.57	mg/L	Potentiometric	YSI ProDO Tester
COD	1.12	mg/L	Titrimetic	Titrator
Total Nitrogen	0.48	mg/L	Kjeldahl	Kjeldahl distillation assembly
Total Phosphorus	25.09	µg /L	NS 4725	SFA(SKALAR SAN plus Analyzer) SA 3000/5000,SA 1100
Total Suspended Solids	0.4	mg/L	NS 4733:1983	Circulation and Filtration System

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

Water Quality Laboratory, Forest Research Institute, Yezin
No .....
Date .....

Ref : WQL/0250/2023
Date:18-9-2023

ANALYTICAL TEST REPORT

Customer Name:**Thapyaywa Solar Power Project**
Customer Address :

Assignment number	WL/2023-79	Sampling Location	
Sample number	3	Sampling Date	
Sample type	Ground Water	Sample received date	27-8-2023
Comments			

Parameter	Result	Unit	Method reference	Instruments
pH	8.43	-	ISO 10523:2008	ManTech Robot (PC-1300-475E)
Turbidity	42	*FNU*	ISO 7027:1999	ManTech Robot (MT-165-981)
Total Alkalinity	8.24	*mmol/l*	NS-ISO 7888:1993	ManTech Conductivity, Model 4510 Conductivity/TDS meter
BOD	0.55	mg/L	Potentiometric	YSI ProDO Tester
COD	1.10	mg/L	Titrimetic	Titrator
Conductivity	103.32	*mS/m*	NS-ISO 7888:1993	ManTech Conductivity, Model 4510 Conductivity/TDS meter
Chloride	19.23	*mg/L*	Titrimetric	Titrator
Total Nitrogen	0.68	mg/L	Kjeldahl	Kjeldahl distillation assembly
Total Phosphorus	19.22	µg /L	NS 4725	SFA(SKALAR SAN plus Analyzer) SA 3000/5000,SA 1100
Total Suspended Solids	0.33	mg/L	NS 4733:1983	Circulation and Filtration System

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

PRO LAB
ANALYTICAL LABORATORY

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

LABORATORY ANALYSIS REPORT

1	Client Name	: Thapyaywa Solar Power Project
2	Location	: Thazi Township
3	Type of Sample	: GW
4	Sample No.	: 00760/2023
5	Contact Person	: Ko Wai Yan Htoo
6	Phone No.	: 09-797005176
7	Date Received	: 28.08.2023
8	Date of Test Performed	: 28.08.2023
9	Date of Issued	: 04.09.2023
10	Result	:

No.	Parameter	Result	Unit	WHO STD 2018	Method
1	Color	58	PCU	15 TCU	Hanna HI97727 - Color of Water Photometer
2	Iron	1.66	mg/L	0.3 mg/L	[a] 3500-F B, Phenanthroline Method
3	Manganese	0.064	mg/L	0.4 mg/L	Hach DR 3900 Spectrophotometer, 1 - (2 - Pyridylazo) - 2 - Napthol (PAN) Method
4	Oil and Grease	10	mg/L	NA	[a] 5520D, Soxhlet Extraction Method
5	Total Coliform	9.3	MPN/ml	ND per 100 mL	FDA-BAM: MPN Method

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

[a] American Public Health Association, Standard Methods for the Examination of Water and Wastewater.

Tested By
Name : NAW EH THA KU
Position : Laboratory Technician
Signature :.....

Approved By
Name : KYAWT KYAWT YIN
Position : Technical Consultant Manager
Signature :.....

Myanmar Innovation Group Co., Ltd. PRO LAB

LAB-FO-024-00

PRO LAB
ANALYTICAL LABORATORY

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

LABORATORY ANALYSIS REPORT

1	Client Name	: Thapyaywa Solar Power Project
2	Location	: Thazi Township
3	Type of Sample	: WW
4	Sample No.	: 00761/2023
5	Contact Person	: Ko Wai Yan Htoo
6	Phone No.	: 09-797005176
7	Date Received	: 28.08.2023
8	Date of Test Performed	: 28.08.2023
9	Date of Issued	: 04.09.2023
10	Result	:

No.	Parameter	Result	Unit	WHO STD 2018	Method
1	Oil and Grease	9	mg/L	-	[a] 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.

[a] American Public Health Association, Standard Methods for the Examination of Water and Wastewater.

Tested By
Name : NAW EH THA KU
Position : Laboratory Technician
Signature :.....

Approved By
Name : KYAWT KYAWT YIN
Position : Technical Consultant Manager
Signature :.....

Myanmar Innovation Group Co., Ltd
PRO LAB

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/0284/2023
Date: 27-9-2023

ANALYTICAL TEST REPORT

Customer Name:**Thapyaywa Solar Power Project**

Customer Address :

Assignment number	2023-90	Sampling Location	သာစည်
Sample number	1	Sampling Date	-
Sample type		Sample received date	26-9-2023
Comments			

Parameter	Result	Unit	Method reference	Instruments
pH	8.79	-	ISO 10523:2008	ManTech Robot (PC-1300-475E)
Conductivity	110.17	*mS/m*	NS-ISO 7888:1993	ManTech Conductivity, Model 4510 Conductivity/TDS meter
Total Dissolved Solids	607	*mg/L*	Manual	PROZOR® TDS&EC Test Meter
Water Temperature	26.74	*℃*	Potentiometric	HQ40d multi Field Tester

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

မန္တလေးတိုင်းဒေသကြီး၊ မိတ္ထီလာခရိုင်၊ သာစည်မြို့နယ်၊ သပြေဝကျေးရွာအုပ်စုရှိ Environmental Management Plan (EMP) အတည်ပြုပြီး ဖြစ်သော Clean Power Energy Co., ltd ၏ ၃၀ မဂ္ဂါဝပ် သပြေဝနေရောင်ခြည်စွမ်းအင်သုံး ဓာတ်အားပေးစက်ရုံစီမံကိန်း၏ စောင့်ကြပ်ကြည့်ရှုမှု အစီရင်ခံစာအတွက် အကြံပြုချက်/ သုံးသပ်ချက်များအား ပြန်လည်ဖြည့်စွက်ဖော်ပြခြင်း

စဉ်	ဖြည့်စွက်ပြင်ဆင်ရမည့်အချက်	ပြန်လည်ဖြေကြားချက်များ
(က)	စောင့်ကြပ်ကြည့်ရှုမှုအစီရင်ခံစာအား ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၁၀၉ နှင့်အညီ ရေးဆွဲပြီး အပိုဒ် ၁၀၈ နှင့်အညီ (၆) လလျှင် (၁) ကြိမ် ပုံမှန်အစီရင်ခံတင်ပြရန်နှင့် စောင့်ကြပ်ကြည့်ရှုမှုအစီရင်ခံစာ တင်ပြရာတွင် တင်ပြလာသည့် အကြိမ်မြောက်အား ထည့်သွင်းဖော်ပြရန်၊	Clean Power Energy Co., ltd အနေဖြင့် စောင့်ကြပ်ကြည့်ရှုမှု အစီရင်ခံစာအား ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများနှင့်အညီ ပုံမှန်အစီရင်ခံတင်ပြလျက်ရှိပြီး စောင့်ကြပ်ကြည့်ရှုမှုအစီရင်ခံစာ တင်ပြရာတွင် တင်ပြလာသည့် အကြိမ်မြောက်အား အစီရင်ခံစာ၏ အပေါ်မျက်နှာဖုံးတွင် ထည့်သွင်းဖော်ပြသွားပါမည်။
(ခ)	စောင့်ကြပ်ကြည့်ရှုမှုအစီရင်ခံစာ (EMR) တင်ပြရာတွင် အတည်ပြုပြီး အစီရင်ခံစာ ကတိကဝတ်များနှင့် အတည်ပြု အကြောင်းကြားစာပါ ညွှန်ကြားချက်များအပေါ် အကောင်အထည်ဖော် ဆောင်ရွက်ထားရှိမှုများကို ထည့်သွင်းဖော်ပြရန်၊	Clean Power Energy Co., ltd အနေဖြင့် စောင့်ကြပ်ကြည့်ရှုမှု အစီရင်ခံစာအား တင်ပြရာတွင် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများနှင့်အညီ အစီရင်ခံစာ ကတိကဝတ်များနှင့် အတည်ပြု အကြောင်းကြားစာပါ ညွှန်ကြားချက်များအပေါ် လိုက်နာအကောင်အထည်ဖော် ဆောင်ရွက်လျက်ရှိပါသည်။
(ဂ)	လေထု၊ မြေထု၊ ရေထု၊ အသံနှင့် တုန်ခါမှုတိုင်းတာရရှိချက်များ ဖော်ပြရာတွင် တိုင်းတာရေး ကိရိယာများမှ ရရှိလာသည့်ရလဒ် Digital Format များအား Soft Copy များဖြင့် ပူးတွဲ	လေအရည်အသွေးနှင့် ဆူညံသံ တိုင်းတာမှု ရလဒ်များအား စာမျက်နှာ (၉)၊ စာမျက်နှာ(၁၁)နှင့် စာမျက်နှာ(၁၂) တို့တွင် excel form များဖြင့် ဖော်ပြထားပါသည်။ ရေအရည်အသွေး

စဉ်	ဖြည့်စွက်ပြင်ဆင်ရမည့်အချက်	ပြန်လည်ဖြေကြားချက်များ
	တင်ပြရန်နှင့် လေထုအရည်အသွေးတိုင်းတာရာတွင် Data Result များ ပါဝင်သည့် Excel Form ဇယားအား ၂၄ နာရီ အတွက် ပြည့်စုံစွာထည့် သွင်းဖော်ပြရန်၊	တိုင်းတာမှု ရလဒ်များအား Appendix 1 ဖြင့် ဖော်ပြထား ပါသည်။
(ဃ)	လေ၊ ရေ၊ မြေ၊ ဆူညံသံ တိုင်းတာရရှိသည့်ရလဒ်များအား အတည်ပြုပြီး EMP အစီရင်ခံစာပါ လေ၊ ရေ၊ မြေ၊ ဆူညံသံ တို့၏ Baseline Result များနှင့်အတူ နှိုင်းယှဉ်ဖော်ပြရန်၊	လေအရည်အသွေးရလဒ်အား Baseline Result များနှင့်အတူ စာမျက်နှာ (၁၀) တွင် နှိုင်းယှဉ်ဖော်ပြထားပါသည်။ ဆူညံသံ အရည်အသွေး နှိုင်းယှဉ်ပြရလဒ်များအား စာမျက်နှာ (၁၃) တွင် လည်းကောင်း၊ ရေအရည်အသွေး နှိုင်းယှဉ်ပြ ရလဒ်များအား စာမျက်နှာ (၁၆)၊ (၁၇)နှင့် (၁၈)တို့တွင် လည်းကောင်း ဖော်ပြ ထားပါသည်။
(င)	အတည်ပြုချက်ရရှိပြီးသော အစီရင်ခံစာများနှင့်ပတ်သက်၍ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် အပိုဒ် ၁၀၈ တွင် “စီမံကိန်းအဆိုပြုသူသည်ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ်၏ ဇယားပါအတိုင်း စောင့်ကြပ်ကြည့်ရှုမှု အစီရင်ခံစာကို ဝန်ကြီးဌာနသို့ (၆) လ (၁) ကြိမ် သို့မဟုတ် ဝန်ကြီးဌာနက သတ်မှတ်သည့်အတိုင်း တင်ပြရမည်”ဟု ဖော်ပြပါရှိပါသဖြင့် Clean Power Energy Co., Ltd အနေဖြင့် ၂၈- ၉- ၂၀၂၂ ရက်နေ့တွင် အတည်ပြုချက် ရရှိခဲ့ပြီးနောက် Monitoring Report အား (ပထမအကြိမ်)တင်ပြလာခြင်း ရှိပါကြောင်းနှင့် ၂၈- ၉- ၂၀၂၃ ရက်နေ့တွင် ဒုတိယအကြိမ်	Clean Power Energy Co., Ltd အနေဖြင့် စောင့်ကြပ်ကြည့်ရှုမှု အစီရင်ခံစာများကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများနှင့်အညီ မိတ္ထီလာခရိုင်၊ ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဦးစီးဌာန၊ လက်ထောက်ညွှန်ကြားရေးမှူးရုံးသို့ မပျက်မကွက် ပြန်လည်တင်ပြသွားပါမည်။

စဉ်	ဖြည့်စွက်ပြင်ဆင်ရမည့်အချက်	ပြန်လည်ဖြေကြားချက်များ
	တင်ပြရမည် ဖြစ်ပါသောကြောင့် (၆) လပတ် စောင့်ကြပ်ကြည့်ရှုမှုအစီရင်ခံစာများကို မိတ္ထီလာခရိုင်၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဦးစီးဌာန၊ လက်ထောက်ညွှန်ကြားရေးမှူးရုံးသို့ (မပျက်မကွက်) မပျက်မကွက် အမြန်ဆုံး တင်ပြသွားရန်။	