

ENVIRONMENTAL AUDIT REPORT
of
Shiksha Mandal Wardha's
Shrikrishnadas Jajoo Grameen
Seva Mahavidyalaya, Pipri
Wardha



Year: 2022-23

Prepared by:

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ENVIRONMENTAL AUDIT CERTIFICATE

Certificate No: ES/SJGM/22-23/03

Date: 17/05/2023

This is to certify that we have conducted Environmental Audit at Shrikrishnadas Jajoo Grameen Seva Mahavidyalaya Pipri, Wardha, in the Year 2022-23.

The Institute has adopted following Energy Efficient & Green Practices:

- Usage of Energy Efficient LED Light Fitting
- Installation of 2000 LPD Solar Thermal Water Heating System
- Segregation of Waste at Source
- Installation of Bio & Vermi Composting Bed
- Installation Bio Gas Plant
- Installed Septic Tank and it cleans periodically
- Installation of Sanitary Waste Incinerator
- Installation of Rain Water Harvesting Project
- Tree Plantation in the campus
- Creation of awareness by display of Posters on Resource Conservation

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the Eco Friendly.

For Engress Services,

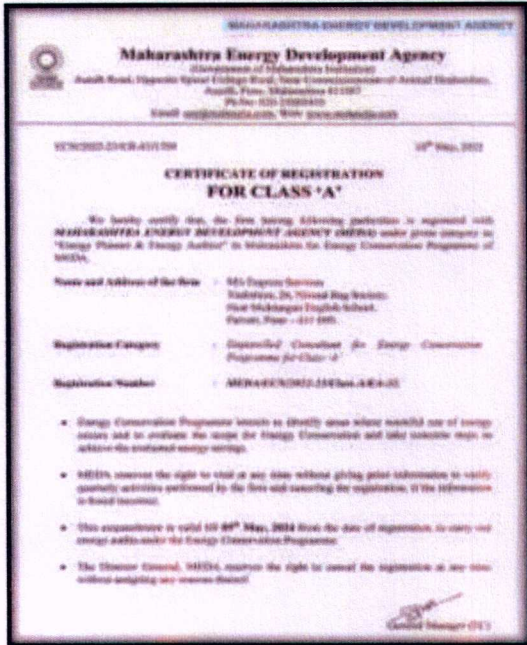


A Y Mehendale,

B E- Mech, M Tech-Energy, Certified Energy Auditor, EA-8192
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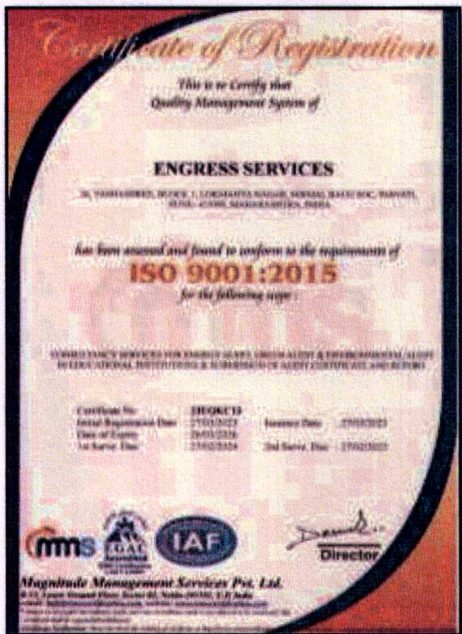
REGISTRATION CERTIFICATES



MEDA Registration Certificate



GEM Certified Professional Certificate



ISO: 9001-2015 Certificate



ISO: 14001-2015 Certificate



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ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Shrikrishnadas Jajoo Grameen Seva Mahavidyalaya Pipri, Wardha, for awarding us the assignment of Environmental Audit of their Campus for the Year: 2022-23.

We are thankful to all the staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. Shrikrishnadas Jajoo Grameen Seva Mahavidyalaya Pipri, Wardha consumes Energy in the form of **Electrical Energy** used for various Electrical Equipment, office & other facilities.

2. Pollution due to Institute Activities:

- **Air pollution:** Mainly CO₂ on account of Electricity Consumption
- **Solid Waste:** Bio degradable Garden Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO₂ Emission:

No	Particulars	Value	Unit
1	Annual Energy Consumption	12490	kWh
2	Annual CO ₂ Emissions	11.24	MT

4. Various initiatives taken for Environmental Conservation:

- Usage of Energy Efficient LED fittings
- Installation of 2000 LPD Solar Thermal Water Heating System
- Bio & Vermi Composting Pit installation
- Bio Gas Plant Installation

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	50	31	49.5
2	Minimum	33	20	26

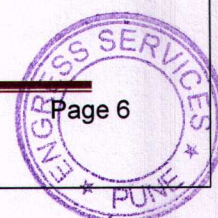
6. Indoor Comfort Conditions:

No	Parameter/Value	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	35.7	42	295	32
2	Minimum	34	39	210	29

7. Waste Management:

7.1 Segregation of Waste at Source:

The Waste is segregated at source in separate Waste Bins & is handed over for further action.



7.2 Bio Composting & Vermi Composting Pit:

The Institute has a Bio Composting & Vermi Composting Pit, to convert the Leafy Waste into Bio Compost.

7.3 Organic Waste Management:

The College is in process of installation of Bio Gas Plant for conversion of Bio degradable Waste.

7.4 Liquid Waste Management:

The Institute has installed Septic Tank and it cleans periodically.

7.5 Sanitary Waste Management:

The Institute has installed Sanitary Waste Incinerator, for disposal of the Sanitary Waste.

7.6 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

8. Rain Water Harvesting:

The Institute has installed the Rainwater harvesting project; the rain water falling on the terrace is collected through pipes and is used for recharging the bore well.

9. Environment Friendly Initiatives:

- Maintenance of Internal Garden: About **300 Plus** Trees in the campus.
- Display of Posters on Resource Conservation

10. Assumption:

1. 1 kWh of Electrical Energy releases **0.9 Kg of CO₂** into atmosphere

11. References:

- For CO₂ Emissions: www.tatapower.com
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI & Water Quality Standards: www.cpcb.com

ABBREVIATIONS

Kg	: Kilo Gram
MSEDCL	: Maharashtra State Distribution Company Limited
MT	: Metric Ton
kWh	: kilo-Watt Hour
LPD	: Liters per Day
LED	: Light Emitting Diode
AQI	: Air Quality Index
PM-2.5	: Particulate Matter of Size 2.5 Micron
PM-10	: Particulate Matter of Size 10 Micron
CPCB	: Central Pollution Control Board
ISHRAE	: The Indian Society of Heating & Refrigerating & Air Conditioning Engineers

CHAPTER-I INTRODUCTION

1. Important Definitions:

1.1. Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

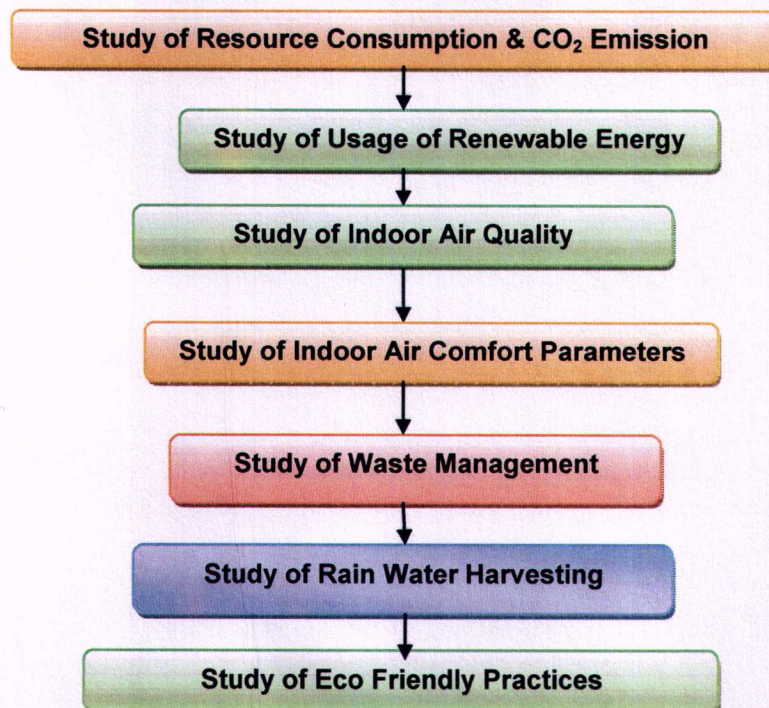
1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are complied with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment"

1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.4 Audit Procedural Steps:



1.5 Institute Location Image:



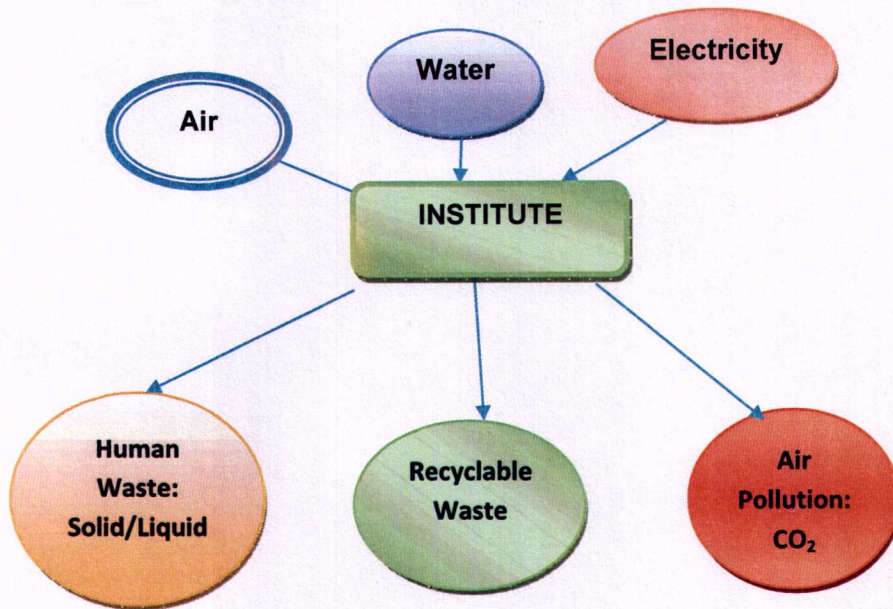
**Institute
Campus**

CHAPTER-II STUDY OF RESOURCE CONSUMPTION & CO₂ EMISSION

The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the Institute System & Environment as under.
Chart No 1: Representation of Institute as System & Study of Resources & Waste



Now we compute the Generation of CO₂ on account of consumption of Electrical Energy. The basis of Calculation for CO₂ emissions due to Electrical Energy is as under.

- 1 kWh of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere

Table No 5: Study of Consumption of Electrical Energy & CO₂ Emissions: 22-23:

No	Month	Energy Consumption	CO ₂ Emissions, MT
1	Apr-22	1141	1.026
2	May-22	1303	1.172
3	Jun-22	1071	0.963
4	Jul-22	1071	0.963
5	Aug-22	1071	0.963
6	Sep-22	2337	2.103
7	Oct-22	1082	0.973



8	Nov-22	750	0.675
9	Dec-22	995	0.895
10	Jan-23	565	0.508
11	Feb-23	478	0.430
12	Mar-23	626	0.563
13	Total	12490	11.24
14	Maximum	2337	2.103
15	Minimum	478	0.430
16	Average	1040.83	0.936

Chart No 2: Month wise CO₂ Emissions:

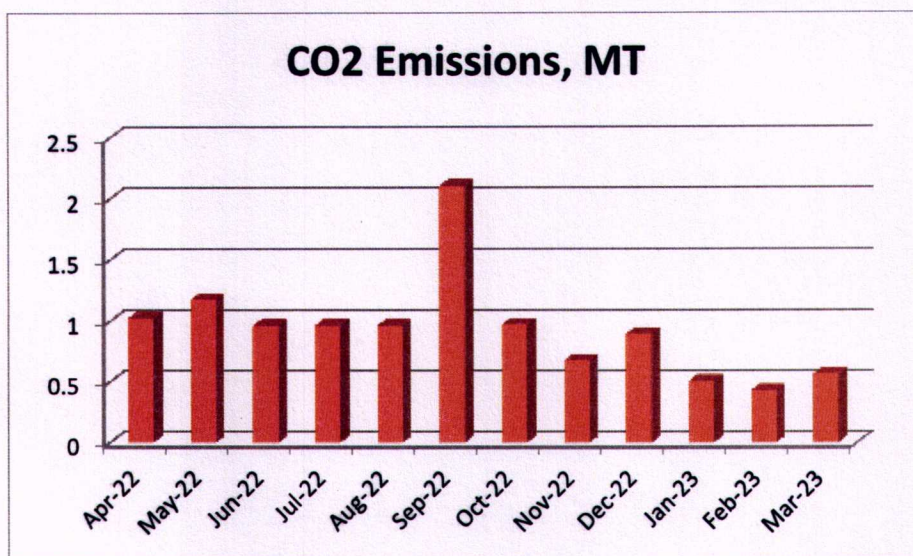
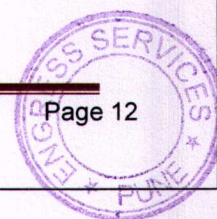


Table No 6: Important Parameters:

No	Parameter/ Value	Net Energy Consumption (kWh)	CO2 Emissions MT
1	Total	12490	11.24
2	Maximum	2337	2.103
3	Minimum	478	0.430
4	Average	1040.83	0.936



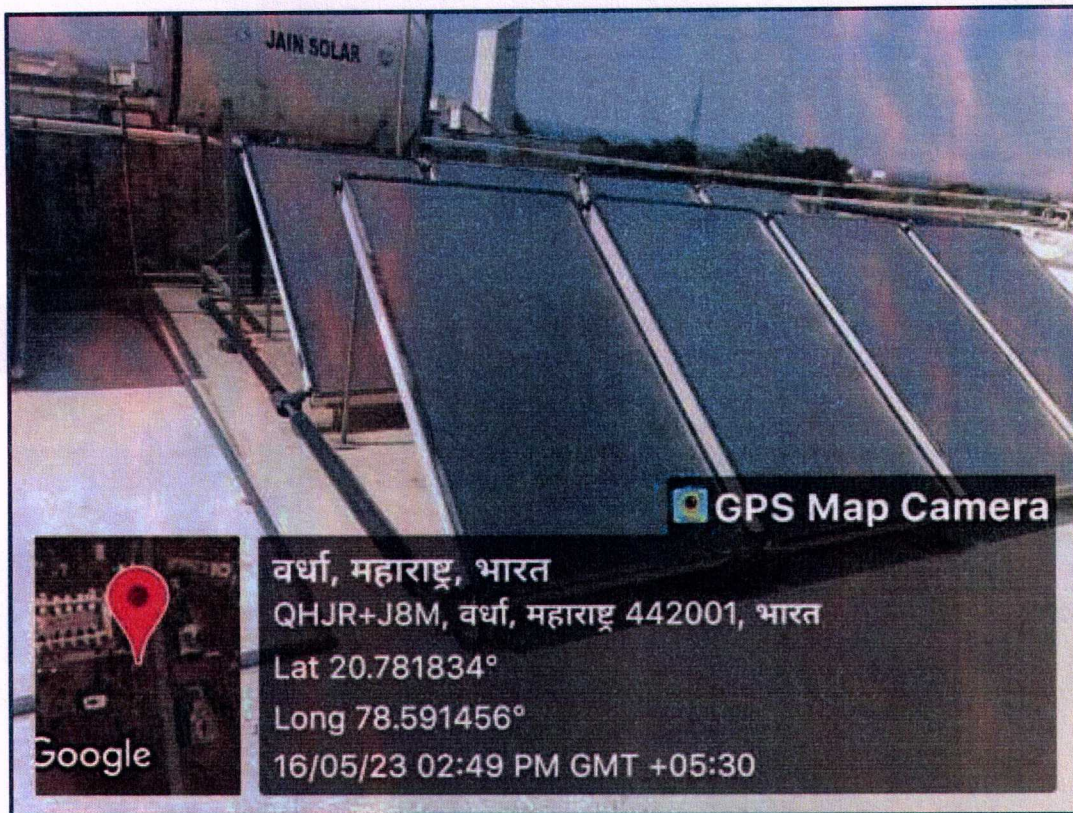
CHAPTER III

STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed Solar Thermal Water Heating System at the Hostel Blocks. It is recommended to install Roof Top Solar PV Plant. The details of Solar Thermal Water Heating Capacities are:

- On Girls Hostel Block:2000 LPD

Photograph of Roof Top Solar PV Plant:



CHAPTER IV STUDY OF INDOOR AIR QUALITY

4.1 Importance of Air Quality:

Air: The common name given to the atmospheric gases used in breathing and photosynthesis.

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 liters** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's livability.

Air quality is a measure of the suitability of air for breathing by people, plants and animals.

4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the **air pollution** levels and communicate it to the population. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects. The measurement of the **AQI** requires an **air monitor** and an **air pollutant** concentration over a specified **averaging period**.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM-2.5- Particulate Matter of Size 2.5 micron
3. PM-10- Particulate Matter of Size 10 micron

Table No 7: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	PM-10
1	Principal Office	49	30.2	49.5
2	Admin Office	48	30	49
3	Conference Hall	49	30	49
4	Seminar Hall	46	28	42
5	IQAC Cell	35	21	26
6	Girls Common Room	45	23	37
7	Library	45	23	37
8	NSS Dept	50	31	42
9	Class Room 9	36	22	26
10	Class Room 10	33	20	30
11	Class Room 11	46	28	39
12	Class Room 12	48	27	34
13	Class Room 1	33	20	28
14	Maximum	50	31	49.5
15	Minimum	33	20	26



CHAPTER V STUDY OF INDOOR COMFORT CONDITION PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit. The Parameters include:

1. Temperature
2. Humidity
3. Lux Level
4. Noise Level.

Table No 8: Study of Indoor Comfort Condition Parameters:

No	Location	Temperature, oC	Humidity, %	Lux Level	Noise Level, dB
1	Principal Office	35.1	39	210	32
2	Admin Office	35.1	39	240	31.7
3	Conference Hall	34.8	41	210	31.5
4	Seminar Hall	34.8	41.8	230	31
5	IQAC Cell	34.7	42	245	31
6	Girls Common Room	34	42	244	32
7	Library	34	42	295	31
8	NSS Dept	35	40	290	31
9	Class Room 9	35.5	39	250	30
10	Class Room 10	35.1	39	220	31
11	Class Room 11	35.1	42	225	30
12	Class Room 12	35.7	42	244	31
13	Class Room 1	34	42	220	29
14	Maximum	35.7	42	295	32
15	Minimum	34	39	210	29



CHAPTER VI STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

The Waste is segregated at source in separate Waste Bins & is handed over for further action.

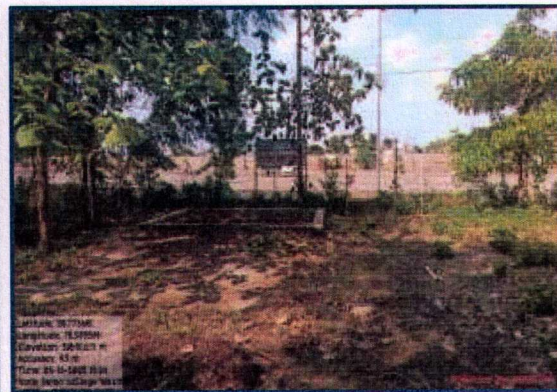
Photograph of Waste Collection Bins:



6.2 Bio Composting & Vermi Composting Pit:

The Institute has a Bio Composting & Vermi Composting Pit, to convert the Leafy Waste into Bio Compost.

Photograph of Bio Composting & Vermi Composting Pit:



6.3 Organic Waste Management:

The College has installed of Bio Gas Plant for conversion of Bio degradable Waste from Hostel Kitchen.

Photograph of Tank of Bio Gas Plant:

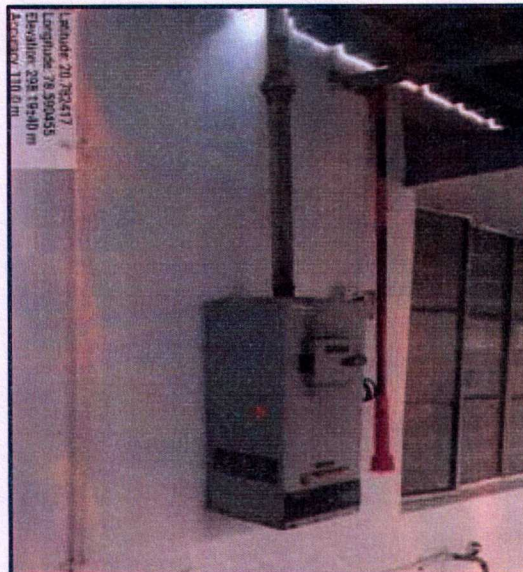


6.4 Liquid Waste Management:

The Institute has installed Septic Tanks it cleans periodically.

6.5 Sanitary Waste Management:

The Institute has installed Sanitary Waste Incinerator, for disposal of the Sanitary Waste.



6.6 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.



CHAPTER-VII STUDY OF RAIN WATER HARVESTING

The Institute has implemented the Rain Water Harvesting Project. The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used for recharging the water table of land and gardening purpose..

Photograph of Rain Water Harvesting Pipes & Recharge Section:



CHAPTER-VIII STUDY OF ECO FRIENDLY INITIATIVES

8.1 Internal Tree Plantation:

The Institute has well maintained landscaped garden in the campus.

Photograph of Tree plantation:



8.2 Creation of Awareness about Energy Conservation:

The Institute has displayed posters emphasizing on importance of Energy Conservation.

Photograph of Poster on Energy Conservation:



**ANNEXURE-I:
VARIOUS AIR QUALITY, WATER QUALITY, NOISE & INDOOR
COMFORT STANDARDS:**

1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

2. Recommended Water Quality Standards:

No	Designated Best Use	Criteria
1	Drinking Water Source without conventional Treatment but after disinfection	pH between 6.5 to 8.5 Dissolved Oxygen 6 mg/l or more
2	Drinking water source after conventional treatment and disinfection	pH between 6 to 9 Dissolved Oxygen 4 mg/l or more
3	Outdoor Bathing (Organized)	pH between 6.5 to 8.5 Dissolved Oxygen 5 mg/l or more
4	Controlled Waste Disposal	pH between 6 to 8.5



3. Recommended Noise Level Standards:

No	Location	Noise Level dB
1	Auditoriums	20-25
2	Outdoor Playground	55
3	Occupied Class Room	40-45
4	Un occupied Class Room	35
5	Apartment, Homes	35-40
6	Offices	45-50
7	Libraries	35-40
8	Restaurants	50-55

4. Thermal Comfort Conditions: For Non-conditioned Buildings:

No	Parameter	Value
1	Temperature	Less Than 33°C
2	Humidity	Less Than 70%

