Reg: Enviraj/CERT/MITS/02A

Issue date:28/06/2022

Global Waste Cleaning Network

Member Ref: GWCN/M22.926

Certificate No: 22EEGQ75

CERTIFICATE

This is to certify that

M/s Madhav Institute of Technology & Science
Gwalior (M.P) India 474005

has been assessed by us for institutional performance against its environmental policies and objectives to fulfil the requirement of

Environmental Audit

The Institute's environmental protection measures have been verified in the submitted report and found to be satisfactory.

The administration's efforts to comply with ISO 14001:2015 and reduce environmental pollution while adhering to all applicable environmental standards are greatly appreciated.

Rajdeep Pandey
For Enviraj Consulting Pvt. Ltd.

Enviraj Consulting Pvt. Ltd.
F-29 Bhagat Singh Nagar, Bhind Road Gwalior-474005 | P: 7987416317 | E: info@enviraj.com | W: www.enviraj.com

ENVIRONMENT AUDIT REPORT

(2021-2022)

Madhav Institute of Technology & Science

Gwalior

Submitted by:

Enviraj Consulting Private Limited

(An ISO 14001:2015 Certified Company)

F-29 Bhagat Singh Nagar,
Bhind Road, Gwalior
Madhya Pradesh - 474005
www.enviraj.com

July, 2022

Quality Information

Prepared by	Internal Members
Rajdeep Pandey	Dr. Prachi Gupta (Assistant Professor, CED)
Environmental Consultant & QCI Certified EMS Auditor (Certificate No: PRA/EMS/2225/001)	Er. Arpit Goyal (Assistant Engineer, MITS)

Signature and Seal

Contents

Executive Summary

This audit aims to assess environmental performance of the institute as per the relevant environmental laws and guidelines and evaluate the performance of initiative taken by the administration for continual improvement. This can assist the institute in taking action in enhancing performance efficiency and setting new benchmarks in its environmental policy.

During the audit, the three areas Air, Water and Solid waste were assessed for its quality, use, management, disposal & discharge and compared with regulatory standards. It is found that, the institute comply with the relevant environmental guidelines.

Furthermore, many initiatives were taken by the institute to curb the pollution and enhance environmental performance of the campus like composting, rainwater harvesting, sewage treatment & reuse etc. The area specific recommendations were provided for further improvement of environmental performance of the institute.

1. Introduction

Environmental auditing is essentially an environmental management tool for measuring the effects of institutional activities on the environment (air, water, and land) against set standards or environmental laws, as well as investigating, understanding, and identifying gaps in existing institutional performance and assisting in its improvement through recommendations.

Therefore, to assess its environmental performance as well as to meet with NAAC Criteria 7; Institutional Values and Best Practices, the Institution has undergone the Environmental Audit. This audit evaluates an organization's environmental performance including air, water and waste management, while also suggests the ways to improve it.

About Institute

Madhav Institute of Technology & Science (MITS), Gwalior was established in 1957 by His Highness Sir Jiwaji Rao Scindia, Maharaja, of the erstwhile state of Gwalior under open door policy of Govt. of India. The foundation stone of the institute was laid by the then President Dr. Rajendra Prasad, on 20th October, 1956 and the building was inaugurated by President Dr. S. Radhakrishnan on 11th December, 1964.

The institute is affiliated to RGPV, Bhopal but has academic autonomy since 2002 to run courses of its choice. Recently the institute has been granted autonomy by UGC, New Delhi for a period of 6 years w.e.f July 2017. The institute is also accredited by the National Assessment and Accreditation Council (NAAC) for 5 years from September 2017. Many of the programmes are accredited by the National Board of Accreditation (NBA).

The institute has a lush green environment conscious campus of around 44.6 acres which also includes 'Madhav-Van' a small teak wood forest where a large variety of birds can be sighted. The Institute offers 11 Bachelors, 18 Masters and Doctoral

Degrees Programmes in Engineering and Technology. The Institute is a recognized Quality Improvement Programme (QIP) Centre for PG and Ph.D programs. The prime objective of the institute is to provide quality technical education at undergraduate and postgraduate levels.

2. Objectives of the Audit

The objectives of environmental audit are:

- To determine the environmental performance status of an institute
- To monitor ambient environmental condition of the air and noise in the campus
- To assess water usage and solid waste management system
- To ensure compliance with relevant environmental laws and regulations

3. Methodology

The methodology adopted for this audit was a three-step process comprising of:

1. **Data collection:** In this phase, exhaustive data collection was performed using different tools such as observation, survey communicating with responsible persons and measurements. Following steps were taken for data collection:
    - Site Visit
    - Data about the air & noise, water, solid waste was collected by observation and interview.
2. **Data Analysis** - The collected data analysed and compared with the relevant standards.
3. **Findings & Recommendations** – On the basis data analysis results and site observations, recommended were made for further improving environmental performance of the institute.

4. Findings and Recommendations

4.1 Air and Noise

4.1.1 Ambient Air Quality

The closest air quality monitoring station to the institute is located at City Center, Gwalior. The monitoring data on 30 Jun 2022 via City Center, Gwalior – MPPCB monitoring station is presented below.

Sr. No	Parameter	Avg.	Min	Max
1	PM 2.5	19	5	36
2	PM 10	30	12	46
3	NO2	17	9	26
4	SO2	23	18	26
5	NH3	4	3	7
6	CO	19	10	26
7	Ozone	46	24	74
	AQI	**46 (Good)**		

4.1.2 Noise level

The noise level measurements were carried out using noise meter at three locations. The noise level measured in the campus are found within the permissible limit

Sr. No	Location	Min Reading	Max. Reading
1	Admin Building	37.0	45.2
2	Canteen Area	59.3	63.0
3	Main Gate	51.7	60.5

Recommendations

- ✓ The ambient air quality on the specified date was found good. But on the close monitoring of historical data, it is found that air quality deteriorates in the region during the winter season. Also, monitoring station is 5 km far from the

institute. Therefore, real-time monitoring of air quality within the campus is recommended.

- ✓ Noise levels in the monitoring areas was found under limit. Flyers and posters with the phrase "Keep Silence" can be displayed in the college canteen and main building corridors.
- ✓ Periodic air and noise monitoring of DG sets is recommended.

4.2 Water Management

Groundwater is the primary water supply source in the campus. There are six bore wells in the campus. The college stores the water in overhead tank.

Details of Borewells

Sr. No	Location	Borewell depth (ft)
1	Between Hostel No.1 & 2	250
2	Hostel No.7	160
3	Hostel No.6	225
4	Cricket Ground 1	580
5	Cricket Ground 2	5801
6	Director's Bunglow	120

4.2.1 Water Usage

Basic usage of water in campus are; Drinking, Gardening, Construction, Kitchen & Toilets, and Others. And total consumption is 2 ML/month.

4.2.2 Drinking Water quality

To ensure the safe drinking water free from any kind of impurities, there are seven RO-based purification system installed in the campus of the following capacity:

Sr. No	Capacity (LPH)	Purification Technology	Nos
1	1000	Reverse osmosis	2
2	300	Reverse osmosis	4
2	Reverse osmosis	Reverse osmosis	1

The periodic monitoring of drinking water quality is also done and the drinking water quality from every plant do conform with IS 10500 standards. Following are the test results of water samples from multiple locations.

Sr. No	Parameters/ Tests	UNIT	Laboratory Results			Standards
			Boring Water	R.O. II Storey	R.O.III Storey	IS 10500:2012
1	pH	--	8.00	6.90	6.80	6.5-8.5
2	Acidity	mg/l as CaCO3	14	10	10	--
3	Alkalinity	mg/l as CaCO3	380	170	64	200
4	Total Solids	mg/l	876	298	22	--
5	Dissolved Solids	mg/l	844	258	22	500
6	Suspended Solids	mg/l	32	40	Nil	--
7	Chlorides	mg/l	250	102	38	250
8	Total hardness	mg/l as CaCO3	310	190	52	200

4.2.3 Waste water Treatment

For the treatment of Sewage water two MBBR based STP is adopted in the campus with the 50 cum/day and 100 cum/day capacity. The treated water used for the gardening/irrigation purpose.

Below are the STP design standards and MPPCB effluent discharge standards:

Sr. No	Parameters	Inlet Values	MPPCB Standards
1	pH	6.5-10	5.5- 9.5
2	COD	400-500 mg/l	<50 mg/l
3	BOD	200-300 mg/l	<30 mg/l
4	TSS	250-400 mg/l	<30 mg/l
5	O&G	15-25 mg/l	<10 mg/l

4.2.4 Rainwater harvesting

The institute has installed 10 recharge pits in the campus to harvest rainwater coming from the rooftops, pavements and roads.

Recommendations

- Water meter needs to be installed at every inlet and outlet water source.
- Adopting Rooftop RWH with borewell recharge can improve recharge efficiency, and the existing recharge structure can be used to recharge storm water.
- Periodic monitoring of groundwater level and quality is suggested to understand the effects groundwater recharge on water quality and efficiency of the RWH recharge structure.
- Yearly performance evaluation of STPs is recommended for its optimal functioning and maintenance.
- Storey II RO has higher value of suspended solids and TDS, hence needs maintenance.
- Adopting micro irrigation system shall further improve water use efficiency of the campus.

4.3 Solid Waste Management

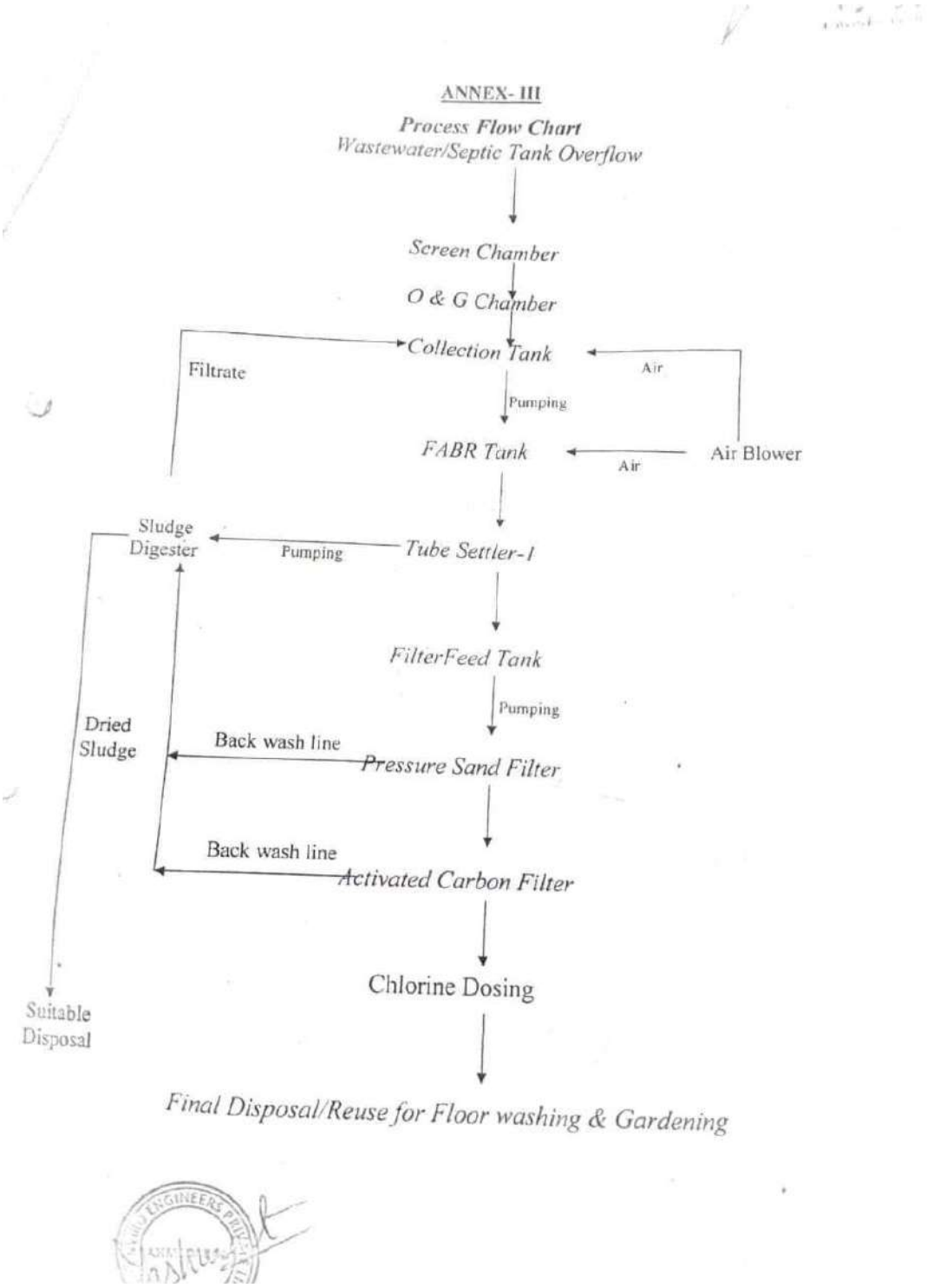
- The institute generates various kind of waste that includes paper cups, metal, plastics etc.
- No hazardous waste is generated in the campus.
- Two bin waste collection system is adopted in the campus; hence segregation of waste is done in the form of dry (non-biodegradable) and wet (biodegradable) waste.
- The biodegradable waste generated is dumped into the compost plant, and the non-biodegradable waste is sold to the agency for recycling.
- The compostable waste and food waste from mess and hostel kitchen is used for composting. The Institute has compact food waste composting plant of 250 kg capacity and organic waste convertor of 100 kg capacity.
- E-waste is collected in the common facility of the campus and supplied to certified E-waste recycler.

Recommendations

- The segregation of waste is well practiced by the institute but the scope for quantification of different types of waste generated is recommended. Systemic waste generation report shall be prepared be group of students for various types of waste. This will be useful for setting baseline, taking new initiative for waste minimization, handling, treatment and disposal in the efficient manner.
- Provisions for proper disposal of biomedical waste from the dispensary should be adopted.
- Use of banner near the two-bin system indicating proper use of bin for different kind of waste is recommended for the better segregation.
- Paper use shall be minimised by adopting a paperless office culture.

Annexure I

STP Process flow Chart



Annexure II

STP Design Criteria

(Design Criteria: STP Plant for Wastewater)

Design Criteria – IS1172:1993 &CPHEEO , BIS NORMS.

(135-140 Liter /bed taken as per IS 1172 (1993): Code of Basic Requirements for Water Supply, Drainage and Sanitation [CED 24: Public Health Engineering.] MOEF & CPHEEO Norms.
Document & Notification released By Bureau of Indian Standard finalized by Water Supply & sanitation department Govt of India.

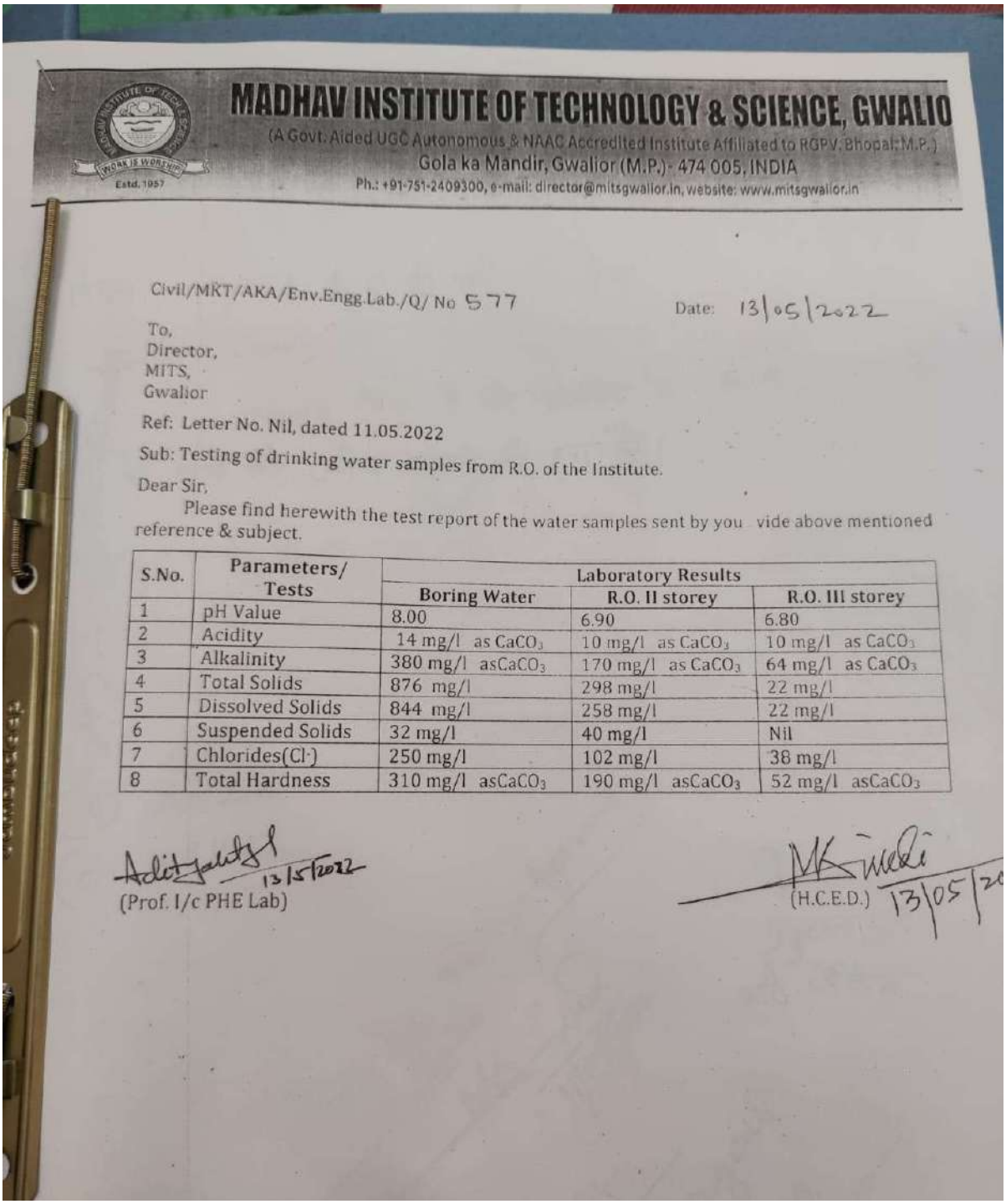
Sewage discharge: $50m^3$/day

Design Flow : $50m^3$/day

pH	6.5-10	**5.5-9.5**
COD	400-500 mg/l	**<50 mg/l**
BOD	200-300 mg/l	**<30 mg/l**
TSS	250-400 mg/l	**<30 mg/l**
O&G	**15-25 mg/l**	**<10 mg/l**

Annexure III

Drinking Water Quality Test Report



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal; M.P.)
Gola ka Mandir, Gwalior (M.P.) - 474 005, INDIA
Ph.: +91-751-2409300, e-mail: director@mitsgwalior.in, website: www.mitsgwalior.in

Estd. 1957 — "WORK IS WORSHIP"

Civil/MKT/AKA/Env.Engg.Lab./Q/ No 577 Date: 13/05/2022

To,
Director,
MITS,
Gwalior

Ref: Letter No. Nil, dated 11.05.2022

Sub: Testing of drinking water samples from R.O. of the Institute.

Dear Sir,

Please find herewith the test report of the water samples sent by you vide above mentioned reference & subject.

S.No.	Parameters/ Tests	Laboratory Results		
		Boring Water	R.O. II storey	R.O. III storey
1	pH Value	8.00	6.90	6.80
2	Acidity	14 mg/l as $CaCO_3$	10 mg/l as $CaCO_3$	10 mg/l as $CaCO_3$
3	Alkalinity	380 mg/l as$CaCO_3$	170 mg/l as $CaCO_3$	64 mg/l as $CaCO_3$
4	Total Solids	876 mg/l	298 mg/l	22 mg/l
5	Dissolved Solids	844 mg/l	258 mg/l	22 mg/l
6	Suspended Solids	32 mg/l	40 mg/l	Nil
7	Chlorides(Cl^-)	250 mg/l	102 mg/l	38 mg/l
8	Total Hardness	310 mg/l as$CaCO_3$	190 mg/l as$CaCO_3$	52 mg/l as$CaCO_3$

13/5/2022
(Prof. I/c PHE Lab)

(H.C.E.D.) 13/05/20

Annexure IV

Photographs

Two bin waste collection system

Pumping well

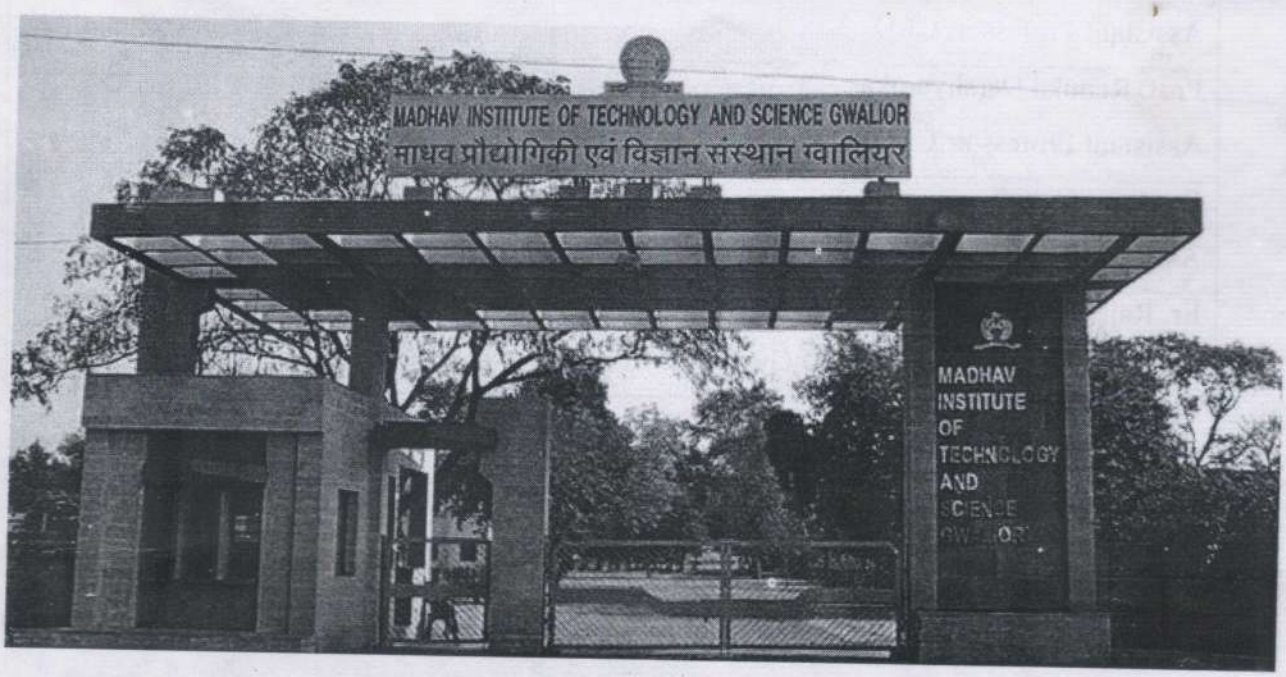
Sewage Treatment Plant

1000LPH RO Plant

Noise Monitoring at College Entry Gate

ENVIRONMENT AUDIT REPORT

2020-21



MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE

GWALIOR, MADHYA PRADESH 474005

Environment Audit Assessment Team

Name of Member	Position
Dr. M. K Trivedi Prof. Head, CED	Chairman
Dr. Prachi Singh Assistant Professor, CED	Internal Member
Prof. Renuka Darshyamkar Assistant Professor, CED	Internal Member
Er. Arpit Goyal Assistant Engineer, MITS Gwalior	Internal Member
Er. Rajendra Singh Bhadoriya Retired Chief Engineer, PHED Gwalior (M.P.)	External Member

Index		
Sr. No.	**Content**	**Pg. No.**
1	Concept	4
2	Introduction	5
3	Overview of Institute	7
4	Courses Offered	10
5	List of Clubs	12
6	Objectives and Scope	14
7	Executive Summary	15
8	Area of Improvement	16
9	Environmental Audit – Questionnaire (As per ISO 19011)	17
10	Best Practices/Initiatives for Environment	23
11	Recommendations	24
12	Conclusions	25
13	References	26
14	Summary of Waste Management Club	27

1. Concept

The term 'Environmental audit' or 'Green audit' means differently to different people. Terms like 'assessment', 'survey' and 'review' are also used to describe similar activities. Furthermore, some organizations/Institutions believe that an 'environmental audit' addresses only environmental matters, whereas others use the term to mean an audit of health, safety and environment-related matters. Although there is no universal definition of environmental Audit, many leading companies/institutions follow the basic philosophy and approach summarized by the broad definition adopted by the International Chambers of Commerce (ICC) in its publication of Environmental Auditing (1989).

The ICC defines Environmental Auditing as: *"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects."*

The outcome of Environmental Audit should be established with concrete evidence that the measures undertaken and facilities in the institution under green auditing.

2. Introduction

A Nation's growth starts from its educational institutions, where the ecology is thought as a prime factor of development associated with environment. Educational institutions now a days are becoming more sensitive to environmental factors and more concepts are being introduced to make them eco-friendly. To preserve the environment within the campus, various viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the energy savings, recycle of waste, water reduction, water harvesting etc. The activities pursued by colleges can also create a variety of adverse environmental impacts.

Environmental auditing is a process whereby an organization's environmental performance is tested against its environmental policies and objectives. Environmental audit is defined as an official examination of the effects a college has on the environment. As a part of such practice, internal environmental audit is conducted to evaluate the actual scenario at the campus.

Environmental audit can be a useful tool for a college to determine how and where they are using the most energy or water or resources; the college can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. Environmental auditing and the implementation of mitigation measures is a win-win situation for all the college, the learners and the planet. It can also create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. Environmental auditing promotes financial savings through reduction of resource use. It gives an opportunity for the development of ownership, personal and social responsibility for the students and teachers. Thus, it is imperative that the college evaluate its own contributions towards a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent. A clean and healthy environment aids effective learning and provides a conductive learning environment. There are various efforts around the world to address environmental education issues.

Environmental Management Systems (EMS) is very popular in the industrial sector, but the general belief is that EMS is something pertaining to industries only. Other parts of the world have started adopting compatible environmental management systems either voluntarily or for promoting standards by external certification. International environmental standards do not suit the existing Indian educational system. Hence a compatible system is adopted by developing locally applicable techniques.

A very simple indigenized system has been devised to monitor the environmental performance of educational institutions. It comes with a series of questions to be answered on a regular basis.

Environmental conditions may be monitored from angles that are relevant to Indian requirements, without stress on legal issues or compliance. This scheme is user-friendly and totally voluntary. The environmental monitoring system helps the institution to set environmental examples for the community and to educate young learners. It can be adapted to urban and / or rural situations.

3. Overview of Institute

Madhav Institute of Technology & Science (MITS), Gwalior was established in 1957 by His Highness Sir Jiwaji Rao Scindia, Maharaja, of the erstwhile state of Gwalior under open door policy of Govt. of India. The foundation stone of the institute was laid by the then President Dr. Rajendra Prasad, on 20th October, 1956 and the building was inaugurated by President Dr. S. Radhakrishnan on 11th December, 1964. On the occasion of Golden Jubilee Celebrations of the institute, the president of India, Dr. Pratibha Devi Singh Patil graced the Golden Jubilee Celebrations of the institute as Chief Guest on 30th June, 2008. A postal stamp on MITS was also released on this occasion.

The institute is affiliated to RGPV, Bhopal but has academic autonomy since 2002 to run courses of its choice. Recently the institute has been granted autonomy by UGC, New Delhi for a period of 6 years w.e.f July 2017. The institute is also accredited by the National Assessment and Accreditation Council (NAAC) for 5 years from September 2017. Many of the programmes are accredited by the National Board of Accreditation (NBA).

An Internal Quality Assurance Cell (IQAC) was established in December 2016 to evolve mechanism and procedures for measuring, monitoring and evaluating quality for various academic and administrative activities of the institution, for the internalization of quality culture and institutionalization of best practices.

The institute successfully completed the Technical Education Quality Improvement programme (TEQIP-Phase II) of MHRD and received 'A' grade in six of the seven performance criterions. Further, the institute is now on board TEQIP-III and is all set to begin working on the twinning agreement signed with the Delhi Technological University (DTU), Delhi.

The institute started its own MOODLE Server (Modular Object-Oriented Dynamic Learning Environment) on 15th august 2017 for open-source course management system to facilitate E-learning, Evaluation, Test / Quiz Conduction, Uploading Assignments etc.

The institute has a lush green environment conscious campus of around 44.6 acres which also includes 'Madhav-Van' a small teak wood forest where a large variety of birds can be sighted. The Institute offers 11 Bachelors, 18 Masters and Doctoral Degrees Programmes in Engineering and Technology. The Institute is a recognized Quality Improvement Programme (QIP) Centre for PG and Ph.D programs. The prime objective of the institute is to provide

quality technical education at undergraduate and postgraduate levels. There is Study Centre of Indira Gandhi National Open University (IGNOU) and Nodal centre of RGPV, Bhopal.

NPTEL (National Programme on Technology Enhanced Learning) Local Chapter has been established on 30th Oct 2017 to provide e-learning through on-line Web and Video courses in Engineering, Sciences, Technology among students.

The Institute has state-of-the-art infrastructure encompassing spacious class rooms equipped with power point projectors, well equipped laboratories, three boys hostels, two girls hostels, Playground, Gymnasium, Dispensary, Bank, ATM, Stationary & Photocopy shop, Canteen, Amul Parlour, Coffee Shop etc.

Central Library currently houses over 1,00,000 books, e-journals from Science Direct, ASME and ASCE under E-Shodh Sindhu & INFLIBNET consortium. The Institute has a high-speed LAN with backbone of optical fiber and manageable switches. The institute is equipped with 100 MBPS leased line from NKN, which is providing high speed 24x7 internet facility in each nook and corner of the Institute.

The institute has DST established Entrepreneurship Development Cell, since 1988. The cell is active throughout the year and conducts various job oriented/innovative certificate courses, Faculty Development Programmes, Entrepreneurship Awareness Camps, Conferences and other activities.

To harness the immense potential and vivacious energy of the students for their all round personality development and confidence building, the institute provided a very active NSS and NCC wing, 07 Chapters of National/International Professional Societies (ISTE, IEEE, IET, ACM, CSI, IETE and SAE-INDIA) & 60 different institute level student clubs in wide areas ranging from technology, art, music, dance, meditation, yoga, health, sports, environment, social awareness etc.

The institute has cricket, basketball, football and tennis grounds, and badminton court along with facilities for indoor games. The institute has been successively receiving awards and top ranks in many sporting events such as Table-Tennis, Badminton, and Basket-ball at the nodal and state level. Prizes are also won in Kho-Kho, chess and football.

4. Courses Offered

Madhav Institute of Technology and Science imparts education in the following Departments:

Year of start	Name of Program	Intake
	UG Courses	
1956	B.Tech Civil Engineering	120
1956	B.Tech Mechanical Engineering	120
1956	B.Tech Electrical Engineering	120
1982	B.Tech Electronics Engineering	120
1984	B. Architecture	40
1994	B.Tech Computer Science & Engineering	120
1996	B.Tech Chemical Engineering	60
2000	B.Tech Information Technology	60
2015	B.Tech Electronics & Telecommunication Engineering	60
2015	B.Tech Automobile Engineering	60
2020	B.Tech Information Technology(Artificial Intelligence and Robotics)	60
2020	B.Tech Internet of Things (IoT) (Offered by Information Technology Department)	60
2020	B.Tech Mathematics and Computing	60
2020	B.Tech Internet of Things (Offered by Electrical Engineering Department)	60
2021	B.Tech Artificial Intelligence(AI) and Data Science	60
2021	B.Tech Artificial Intelligence and Machine Learning	60

2021	B.Tech Computer Science and Design	60
PG Courses		
1986	M.E. Construction Technology & Management	25
1986	Master of Computer Applications (M.C.A.)	60
1995	M.E. Industrial Systems & Drives	25
1995	M.E. Communication Control & Networking	25
2002	M.Tech Production Engineering	18
2004	Masters in Urban Planning	18
2011	M.Tech Computer Science & Engineering	18
2012	M.Tech Information Technology	18
2014	M.Tech Environment Engineering	18
2019	MBA	60
Doctorate Courses		
2011	Ph.D under Quality Improvement Program (QIP) scheme of AICTE- Civil, Mechanical, Electrical, Computer Science Engineering, Architecture	2 seats in each program
2018	Ph.D under National Doctoral Fellowship (NDF) of AICTE- Civil, Mechanical, Electrical, Computer Science Engineering, Architecture	As per AICTE

The total intake is 1587. The college has good infrastructure and qualified and experienced faculty, well supported by competent technical supporting and administrative staff.

5. List of Clubs

- MITS-AID Club
- Art Club
- Dance Club
- Music Club
- Sports Club
- Fitness Transfer
- Naatya Munch
- Wander Lust
- Personality Development Club
- Career Counselling
- Querencia (Literary Club)
- Photography and Film Club
- Holistic Health Club
- MITS CODE WAR
- Innovation @ MITS
- Click (CSE/IT Emerging Tech. Club)
- In Club MITS
- Research Scholar's Club
- Webbers Club
- Finance Club
- Waste Management Club
- TEDEX Club
- International Opportunity Club
- ISC MITS Club
- Competitive Club
- Animation Club
- Biotechnology Group of MITS
- Foodies Club
- Digital Learning Group
- Creative Architects, MITS
- Chemical Engineer's Group, MITS

- ASIMOV (Robotics Club)
- HAM Radio Society of MITS
- The speakers club
- Sky road (gaming) Club
- Analytics Club
- Concrete Structures
- Designers' Club
- October sky (Rocket club, MITS)
- Terrestrial Automobile Dev Club
- MITS Journalism Club
- Branding and Marketing Club
- Technical Exhibition Club
- Hindi Club (Sanhita)
- The Scrabble Club
- The Quiz Club
- Electronics Club
- Aerospace Club
- Girls Empowerment Club
- Social Media Awareness Club
- Disaster Management Awareness Club

6. Objectives and Scope

The broad aims/benefits of the eco-auditing system would be

- Environmental education through systematic environmental management approach
- Improving environmental standards
- Benchmarking for environmental protection initiatives
- Sustainable use of natural resource in the campus.
- Financial savings through a reduction in resource use
- Curriculum enrichment through practical experience
- Development of ownership, personal and social responsibility for the College campus and its environment
- Enhancement of College profile
- Developing an environmental ethic and value systems in young people

7. Executive Summary

An environmental audit is a snapshot in time, in which one assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful bench mark, the audit almost immediately becomes outdated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. MITS already done internal green assessment and annual reports published for continual improvements; QS Programme and doing their bid towards environmental protection and environmental awareness at local and global front. Audit criterion is environmental cognizance, waste minimization and management, biodiversity conservation, water conservation, energy conservation and environmental legislative compliance by the campus. A questionnaire is used during audit. This audit report contains observations and recommendations for improvement of environmental consciousness.

8. Areas of Improvement

- Environment Policy to be adopted by the College Campus.
- Water Meter should be installed and maintain the inventory of ground water extraction resource bore well.
- Storage of chemicals like; paints, gums resins, oils, lubricants, acids etc! in designated place and safety/warning signs should be displayed.
- Internal inspection system should be developed for various aspects of environment available in campus
- Display of environment awareness posters should be there in the prominent areas of campus.

9. Environmental Audit – Questionnaire (As per ISO 19011)

The areas of eco/environmental/green auditing to be followed/practiced by participating institutions:

- Waste Minimization and Recycling
- Greening
- Energy Conservation
- Water Conservation
- Clean Air
- Environmental Legislative
- General Practices

Where is the campus located?

The campus is Located in Gwalior, M.P.

Which of the following are available in your institute?

1	Garden area	Available
2	Play ground	Available
3	Kitchen	Available
4	Toilets	Available
5	Garbage or Waste Store Yard	Available
6	Laboratory	Available
7	Canteen	Available
8	Hostel Facility	Available (Both for Boys & Girls)
9	Guest House	Available
10	Gymnasium	Available
11	Health Centre	Available

Which of the following are found near your institute?

1	Dump yard	Not in vicinity of institute
2	Garbage heap	No Garbage heaps
3	Public convenience	Yes
4	Sewer line	2 km sewer line within campus
5	Stagnant water	None
6	Open drainage	No
7	Industry — (Mention the type)	No
8	Bus / Railway station	Near to the campus

9.1 Waste Minimization and Recycling

1	Does your institute generate any waste? If so, what are they?	Yes, Solid waste, Canteen waste, paper waste, plastic waste, toiletry waste, Horticulture Waste, etc.			
2	What is the approximate amount of waste generated per day? (In Kilograms/month) (approx.)	Bio degradable	Non-Biodegradable	Hazardous	others
		20kg	2kg	Nil	<6kg
3	How is the waste generated in the institute managed? By 1 Composting 2 Recycling 3 Reusing Others (specify)	2 composting pits are there in campus, Sewage water is treated in the STP's located in college campus. Two types of Waste bins are provided at campus for biodegradable and non-biodegradable waste.			
4	Do you use recycled paper in institute?	Yes			
5	Do you use reused paper in institute?	Yes (Reuse of one side printed Paper for internal communication).			
6	How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, please specify.	Yes, Waste Management Club carried out numerous activities. Recycling campaigns, e waste management, Anti-plastic campaigns, sustainable goal awareness programme.			
7	Can you achieve zero garbage in your institute? If yes, how?	Yes, as per new waste management rules all kind of waste is managed in an adequate manner without any deviation.			

9.2 Greening the Campus

1	Is there a garden in your institute?	Yes, about 35 % of total area is the Green	
2	Do students spend time in the garden?	2-3 Hours a day	
3	Total number of Plants in Campus	Plant type	Approx. number
		Trees	More than 2000
		Shrubs	More than 1000
		Grass Cover	4.0 Acres
4	Suggest plants for your campus. (Trees, vegetables, herbs, etc.)	Ficus, Cycas, R.K. Palms, Golden durant, Mahagani, Ixora coccinea, Lillies, Pandas, Nerium Oleander, Palmyra Palm,Crepe Jasmine, Bamboos, Alstonia scholaris, Variengated Durant and many more as per geographical regime.	
5	Is the College campus have any Horticulture Department? Number of Staff working in Horticulture Department	No Thirteen Gardeners	

6	Number of Tree Plantation Drives organized by college per annum. (If Any)	Yes, Three Tree Plantation Drives are Organized Annually. 50+ trees and 100+ shrubs planted in this financial year.
7	Number of Trees Planted in Last FY. Survival Rate	50 80%
8	Plant Distribution Program for Students and Community	No
9	Plant Ownership Program	No

Figure 1 Greening in Campus

9.3 Energy

1	List few ways that you use energy in your institute. (Electricity, LPG, firewood, others). Using this list, try to think of ways that you could use less energy every day.	Electricity is saved by use of LED bulbs for illumination; Alternate source of energy i.e. Solar Panel Installed.
2	Are there any energy saving methods employed in your institute? If yes, please specify. If no, suggest some	Yes, Renewable source of energy through solar plant. A monthly average of 1000 to 3000 units of electricity is generated through solar panels. Messages will be displayed at various locations to aware the People about Energy Savings. Use of Natural Lights and Natural Ventilation are promoted.
3	How many CFL/LED bulbs has your institute installed?	95 % of Total Conventional bulbs are replaced by LED Lights.

4	Are any alternative energy sources employed / installed in your institute? (Photovoltaic cells for solar energy, windmill, energy efficient stoves, etc.,) Specify.	Yes, photovoltaic cells for solar energy, energy efficient stoves
5	Do you run "switch off" drills at institute?	Yes
6	Are your computers and other equipment's put on power-saving mode?	Yes, In Practice
7	Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby modes most of the time? If yes, how many hours?	No

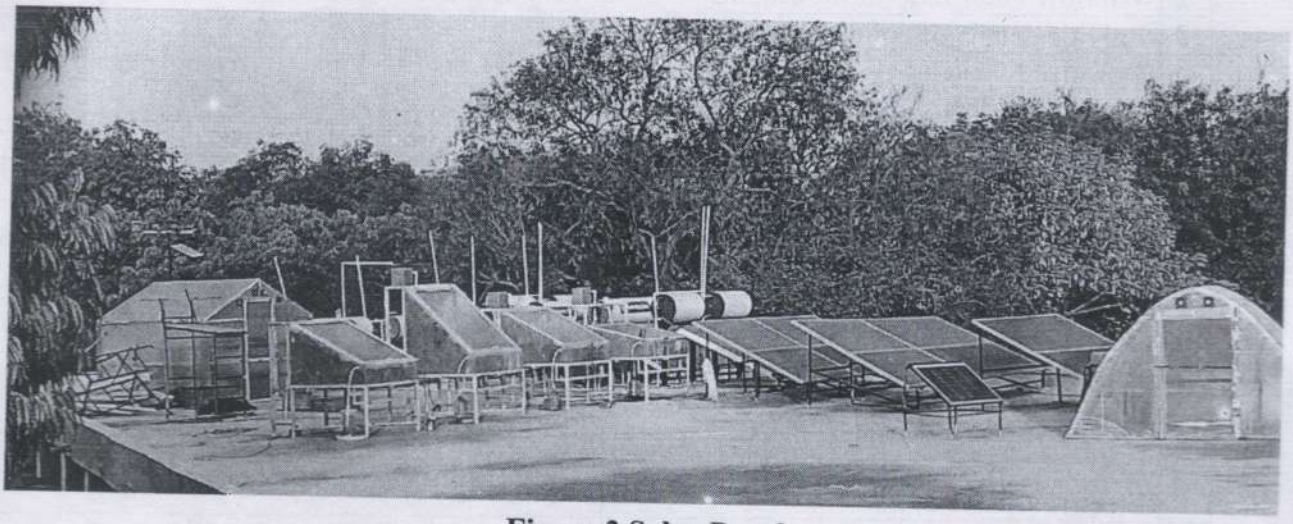


Figure 2 Solar Panel

9.4 Water Conservation

1	List uses of water in your institute	Basic usage of water in campus are; Drinking, Gardening, Construction, Kitchen & Toilets, and Others. And total consumption is 2 ML/month
2	How does your institute store water? Are there any water saving techniques followed in your institute?	Storage tanks are used for storage of water.
3	If there is water wastage, specify why and how can the wastage be prevented / stopped?	No
4	Locate the point of entry of water and point of exit of waste water in your institute.	Entry - Ground water Exit - From sewer system to sewage treatment plants.

5	Write down few ways that could reduce the amount of water used in your institute	By Following ways. 1. Close the taps after usage 2. Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage 3. Water Conservation awareness to the stakeholders.
6	Does your institute harvest rain water?	Twelve number of Modern rain water harvesting system are available.

9.5 Clean Air

1	Are the Rooms in Campus are Well Ventilated?	Yes				
2	Window Floor ratio of the Rooms	Very Good				
3	Provide details of college-owned motorized vehicles?	Buses	Cars	Vans	Ambulance	Total
	No. of vehicles		2	-		
	No. of vehicles more than five years old		-	-	-	
	No. of Air conditioned vehicles					
	PUC done					
4	Specify the type of fuel used by your college's vehicles:	Tota				
	Diesel	2 Car				
	Petrol					
	CNG					
	LPG					
	Electric					
5	Air Quality Monitoring Program (If Any)	Yes				
6	Students suffer from respiratory ailments? (If Any)	No				
7	Details of Power backup	Yes, about 550 KVA Power backup is provided				

9.6 Environmental Legislative Compliance

1	Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes
2	Does your institute have any rules to protect the environment? List possible rules you could include	We have banned single use plastic. Their environment policy includes awareness, and environmental conservation efforts through Waste Management Club. All undergraduates are studying the paper of Environmental Sciences,

3	Does the Institute conduct environmental Ambient Air Quality Monitoring?	NA
4	Does the Institute conduct Water and Wastewater Quality monitoring?	Yes
5	Does the Institute conduct stack monitoring of DG sets?	No
6	Is any warning notice, letter issued by state government bodies?	No
7	Does the Institute generate any Hazardous waste?	No
8	Does the Institute generate any Bio medical waste Institute? If yes, explain its category and disposal method.	No

9.7 General

1	Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes
2	Does your institute have any rules to protect the environment? List possible rules you could include.	Yes, there are some rules like banned single use plastics, strict policy pertaining to electricity uses. Their Environmental Policy includes awareness and environmental conservation.
3	Does housekeeping schedule in your campus?	Yes.
4	Are students and faculties aware of environmental cleanliness ways? If Yes Explain	Yes, periodically pollution reduction, plantation, energy conservation awareness campaigns are carried out by Institute.
5	Does Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?	Yes
6	Does Institute participate in National and Local Environmental Protection	Yes
7	Does Institute have any Recognition/certification for environment friendliness?	No
8	Does Institute use renewable energy?	Yes
9	Does Institution conduct a green/environmental audit of its campus?	Yes
10	Has the institution been audited / accredited by any other agency such as NABL, NABET, TQPM, NAAC etc.?	Yes, NAAC grade B+

10.Best Practices/Initiatives for Environment

1	Renewable Energy	**Solar:** A monthly average of 1000 to 3000 units of electricity generation through solar panels.
2	**Biodiversity Conservation** Flora and fauna conservation	We have lush green campus which provides habitat to various species.
3	**Tree Plantation Drives** Two Drives Annually as well as Every Guest is honoured by Tree Plantation at campus	Yes, periodically the plantation drives by students and staff of campus.
4	**Ground Water Recharge** 12 units of Rain Water Harvesting System with depth 100 ft.	Yes, 100% recharge of the rain water
5	**Pollution Reduction** Personal Vehicles (Students) not allowed at campus	Reduction in Air Pollution through vehicular emission.
6	**E Waste Management** Collection of e-waste	E waste is under process to send to the authorized recyclers for adequate disposal
7	**Solid Waste Management** Lifting of garbage from campus on alternate day by local authority	Yes, different mechanisms for proper disposal and recycling of e-waste, plastic waste, biodegradable waste and MSW
8	**Adoption of Village/society**	No
9	**Water Conservation**	Yes, water saving push taps fitted in the drinking water zone and the toilets to avoid the wastage.

11.Recommendations

- Environmental Monitoring i.e. (Ambient Air Quality Monitoring, Water monitoring need to be conducted by M.P. State Pollution Control Board, approved laboratory with the frequency of six months).
- Water Meter should be installed at the institute for monitoring of water consumption for landscape.
- As practically feasible, avoid the use of personal vehicles inside the campus.

12. Conclusions

This audit involved extensive consultation with all the campus team, interactions with key personnel on wide range of issues related to Environmental aspects. The MITS Gwalior has Environmental Committee for sustainable use of resources. Overall, 60% of the campus is for landscaping. The audit has identified several observations for making the campus premise more environmentally friendly. The recommendations are also mentioned with observations for campus team to initiate actions.

The audit team opines that the overall site is maintained well from environmental perspective. There are no major observations but few things are important to initiate urgently are waste management records by monthly inventory of hazardous waste, rainwater harvesting recharge; water balance cycle and periodic inspection of buildings housekeeping and environment policy.

13.References

- The Environment [Protection] Act – 1986 (Amended 1991) & Rules-1986 (Amended 2010)
- The Petroleum Act: 1934 – The Petroleum Rules: 2002
- The Central Motor Vehicle Act: 1988 (Amended 2011) and The Central Motor VehicleRules:1989 (Amended in 2005)
- Energy Conservation Act 2010.
- The Water [Prevention & Control of Pollution] Act – 1974 (Amended 1988) & the Water (Prevention & Control of Pollution) Rules – 1975
- The Air [Prevention & Control of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules – 1982
- The Gas Cylinders Rules – 2016 (Replaces the Gas Cylinder Rules – 1981
- E-waste management rules 2016
- Electrical Act 2003 (Amended 2001) / Rules 1956 (Amended 2006)
- The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended 2016)
- The Noise Pollution Regulation & Control rules, 2000 (Amended 2010)
- The Batteries (Management and Handling) rules, 2001 (Amended 2010)
- Relevant Indian Standard Code practices
- Internal Records of the Campus

14. Summary of Waste Management Club

The Environment Society of MITS Gwalior, The Waste Management Club, aims to spread awareness amongst students regarding the natural environment that they are a part of, and the impact of their everyday actions on it. We aim to protect the environment by spreading awareness to save energy, water, reducing use of disposable plastics, promoting reusable materials, planting saplings, etc. We believe that better world is not only within reach, but is being built today. We conduct environment friendly events which are not only intellectual, but also interactive and fun to attend. These include workshops, tree plantation drives, rallies, and online awareness campaigns, competitions such as Slam Poetry, Poster Making- online and offline and so on. The Society has also taken pride in being eco-friendly in every little way possible, starting from our paper free, online council elections.

Er. Arpit Goyal	**Prof Renuka Darshyamkar**	**Dr Prachi Singh**	**Dr. M. K Trivedi**
Assistant Engineer,	Assistant Professor,	Assistant Professor,	Professor & Head,
Civil Maintenance Office	CED, MITS Gwalior	CED, MITS Gwalior	CED, MITS Gwalior
(Internal Member)	(Internal Member)	(Internal Member)	(Chairman)

Er. Rajendra Singh Bhadoriya
Ex Chief Engineer, PHED Gwalior (M.P.)
(External Member)

Ref. No. 968-A

Date: 08th June, 2021

To,

Er. Rajendra Singh Bhadoriya,
Retired Chief Engineer,
PHED Gwalior
23, Anupam Nagar,
University Road,
Thatipur, Gwalior-474011

Dear Sir,

The Green & Environment Audits are to be conducted in the Institute during 15th & 16th June, 2021 by the Green & Environment Audits Committee of the Institute. I am pleased to appoint you as External Auditor for the said activity.

TA/DA/Honorarium will be paid as per Institute norms.

Please confirm your willingness and availability on said dates.

Yours Sincerely,

5.6.21

(Dr. R.K. Pandit)
Director

Copy to :-

1. Dean (Academics), MITS, Gwalior
2. Registrar

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

No.: 967-A/ Date: 08.06.2021

ORDER

As per Environmental Sustainability Plan of the Institute, Green & Environment audits are to be conducted during 15-16 June 2021.
In this regard, a committee of following internal/external members is constituted for the conduction of Green & Environment Audits:

(i)	Dr. M. K Trivedi	Chairman
(ii)	Dr. Prachi Singh	Internal Member
(iii)	Prof. Renuka Darshyamkar	Internal Member
(iv)	Er. Arpit Goyal	Internal Member

Er. Rajendra Singh Bhadoriya, Retired Chief Engineer, PHED Gwalior (M.P.) will be External Member in both the audits.

The above committee will complete the Green audit & Environment audit as per standard procedure and submit the audit reports to the office of undersigned on or before 31.06.2021.

8.6.21

(Dr. R. K. Pandit)
Director

Copy to:

(i) Above Committee Members,
(ii) Er. Rajendra Singh Bhadoriya, Retired Chief Engineering, PHED Gwalior (M.P.)
(iii) Dean Academics
(iv) Registrar
(v) HR Section
(vi) Director office.