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	Waste Management, Other Facilities, , ,
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	Physical Facilities
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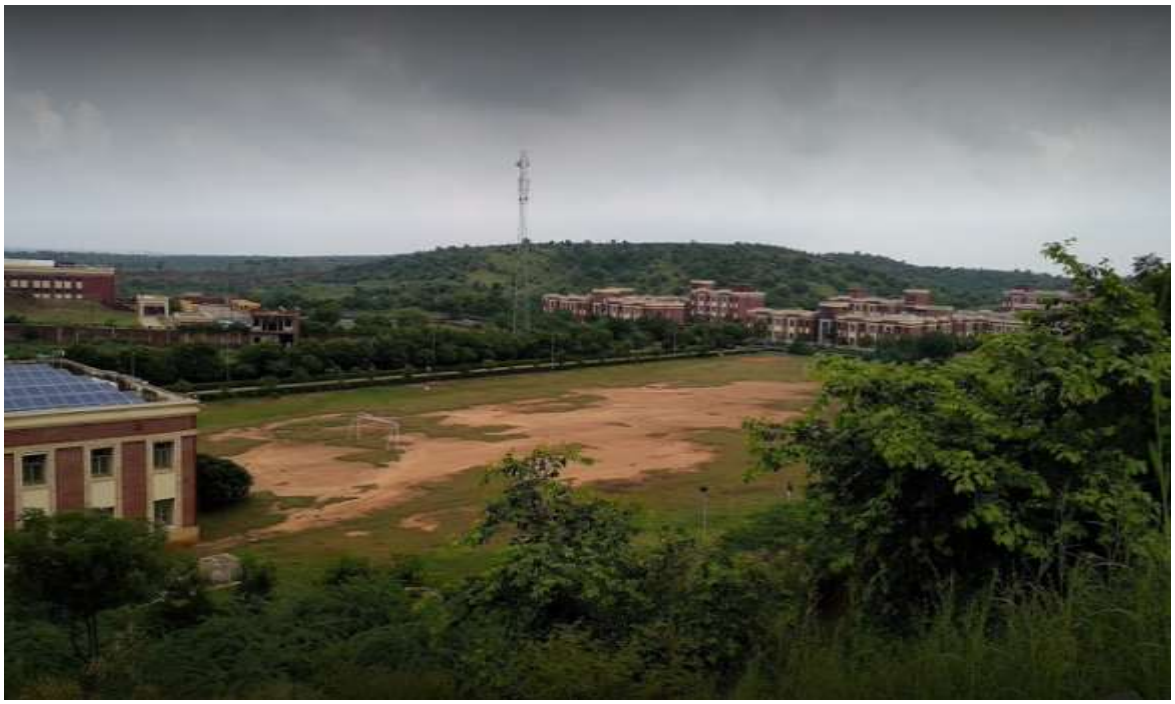
	Geotagged Photos

Registrar
Amity University Madhya Pradesh
Gwalior

AMITY UNIVERSITY
MADHYA PRADESH
(Established by Ritnand Balved Education Foundation)

GREEN AUDIT REPORT
(2017-2018)



Amity University Madhya Pradesh
Maharajpura, Gwalior (M.P.) – 474005, India
Tel No. 91- 751 - 2496021, Fax No. 91-751- 2496023
E-mail:info@gwa.amity.edu
Website: www.amity.edu/Gwalior

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Amity University Madhya Pradesh
Gwalior

Acknowledgement

The Green Audit Assessment Team is thankful to the Lt. Gen. V. K. Sharma, AVSM (Retd.) Hon'ble Vice Chancellor, Amity University Madhya Pradesh, Gwalior for assigning the task of Green Audit. We are also grateful to the administration, staff, faculty members and students for the support during the assessment work.

Our special thanks are due to:

- Pro Vice Chancellor AUMP
- Dy. Pro Vice Chancellor AUMP
- Registrar AUMP
- Director Administration, AUMP

For giving us necessary guidance and inputs to carry out this very important exercise of Green Audit.

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Amity University Madhya Pradesh
Gwalior

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Gwalior

Executive Summary

Green audits serve to identify opportunities to sustainable development practices, enhance environmental quality, improve health, hygiene and safety, reduce liabilities and save money and achieve values of virtue. Concern about environmental degradation and realization of values of environment are logical consequences of scholarly research, teaching and learning process. In its pursuit for improving environmental quality and to maintain a pristine environment for the future generation of students, Amity University Madhya Pradesh, Gwalior has made a self-inquiry on environmental quality of the campus with the following main objectives:

- The specific objectives of the audit are to evaluate the compliance with the applicable regulations, policies, and standards to ensure that the development of the campus foster to the concept of environmental sustainability and green campus.
- The purpose of the audit is to make sure that the practices followed in the campus are healthy and environment friendly.

This report is compiled by a committee constituted by the university. As there was no standard model for such an environment/green audit of campuses in the state, the committee analyzed and evolved a questionnaire. With the help of student volunteers who are part of the ECO Club, a major part of the data was compiled, which the committee analyzed. The remaining part which involved measurement of quality was entrusted with the Department of Environmental Sciences. The committee has made short term and long-term suggestions to take environment protection to higher levels and it is hoped that this will receive due attention of University authorities and all stakeholders of the University.

The methodology included: preparation and filling up of questionnaire, physical inspection of the campus, observation, and review of the documentation, interviewing key persons and data analysis, measurements, and recommendations. It works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity. With this in mind, the specific objectives of the audit was to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the Departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on student health, learning outcome, operational costs, and the environment. The criteria, methods and recommendations used in the audit were based on the identified risks.

Registrar
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Gwalior

1. Introduction

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green Audit' aims to analyse environmental practices within and outside the university campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit.

Green audit is assigned to the criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India which declares the institutions as Grade A, B or C according to the scores assigned during the accreditation.

1.1 About the University

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The University has two N.S.S. units sanctioned by the university, which are doing tremendous job through organizing activities like blood donations, tree plantations, health check-up, personality development etc. are conducted by this unit.

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2. Objectives of the Study

The main objective of the green audit is to promote the Environment Management and Conservation in the University Campus. The purpose of the audit is to identify, quantify, describe, and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies, and standards. The main objectives of carrying out Green Audit are:

- To inculcate awareness among the students to real concerns of environment and its sustainability.
- To promote the concept of environmental conservation to minimize the extent of exploitation of resource use inside the campus.
- To ensure that the development of the campus foster to the concept of environmental sustainability and green campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requiring high cost.
- To bring out a status report on environmental compliance.

3. Methodology

To perform green audit, the methodology included different tools such as physical inspection of the campus, observation, and review of the documentation, interviewing key persons and data analysis, measurements, and recommendations. The study covered the following areas to summarize the present status of environment management in the campus:

- Water management
- Waste management
- Green area management

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4. Green Audit Assessment Team

S.No	Name	Designation
1.	Prof. (Dr.) S.P Bajpai Chairman	HOI, Department of Environmental Science (EVS)
2.	Dr. Swapnil Rai Member	Assistant Professor, Department of Environmental Science
3.	Arch. Aashish Sharma Member	Assistant Professor, Amity School of Architecture and Planning (ASAP)
4.	Mr. Umesh Kumar Sharma Secretary	Assistant Director Administration, AUMP

(Prof. (Dr.) S.P Bajpai) (Dr. Swapnil Rai)

(Arch. Aashish Sharma) (Umesh Kumar Sharma)

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5. Observations and Recommendations

5.1 Water Management

This indicator addresses water consumption, water sources, and fixtures. A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

a) Observations

The University is presently dependent on Borewells which are presently 10 in numbers. The water is hard with average prevailing TDS 1800. However, soft water plant with capacity of 30 KL of ION EXCHANGE is installed in the Campus to improve the quality of water.

In addition, for drinking water 24 Nos of 50 litre capacity RO are fitted in the entire campus. They are regularly maintained under AMC. In addition to above application for water supply has been forwarded to Nagar Nigam, Gwalior for supply of water with overall cost for laying dedicated pipelines amounting to Rs 67 lakh has been deposited by the University. The work is yet to be completed.

Water is used for drinking purpose, toilets, and gardening. During the survey, no loss of water is observed, neither by any leakages, nor by overflow of water from overhead tanks. The data collected from all the departments is examined and verified. Water quality is enhanced by using soft water plant of ION exchange of capacity 30 KL and ROs of 50 liter in 24 Nos are installed in the Campus to provide potable water.

b) Recommendations

- Reuse and recycle of water system are necessary. Although the wastewater from the RO water purifier is used for gardening purpose, the scope can be increased to large scale re-cycling of water.
- Ensure that all cleaning products used by university staff have a minimal detrimental impact on the environment, i.e. they are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.
- Gardens should be watered by using sprinkler system for efficient water management.
- Advanced Rainwater harvesting system needs to be installed in the campus. This will not only provide an additional source of water for use, but it will also help in recharging of the bore wells as well.

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5.2 Waste Management

The university has segregated waste into three parts:

- Solid Waste
- Liquid Waste
- e-Waste

Solid Waste: The waste is generated by all sorts of routine activities carried out in the university that includes paper, plastics, glass, metals, foods, etc. The waste is segregated at each level and source. The administrative supervisor in each block ensures that the waste in each floor is collected at designated time intervals. The block cleaning workers in each floor collect, clean, segregate and compile the waste in the dustbins (Green and Blue) provided at each floor. The floor dustbins are emptied in movable containers/dustbins provided for each block and is taken to the dumping yard provided by the University.

The University has contacted an authorized vendor, who collects the waste from the designated place, segregates them, recycles them and disposes them at the landfills authorized by the government.

Liquid Waste: Liquid wastes generated by the university are of two types:

1. Sewage waste
2. Laboratory, Laundry, and cafeteria effluent waste

The above waste is treated through Sewage Treatment Plants (STPs) and Effluent Treatment Plants (ETPs) and the water is used for horticulture and flushing in toilets.

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The e-waste generated from hardware which cannot be reused or recycled is being disposed-off centrally through government authorized vendors.

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be processed through recycling, repair, and reuse. Solid waste generation and management is a burning issue.

Unscientific handling of solid waste can create threats to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus.

a) Observations

The waste management is well organized in the University. Two STPs have been installed with following capacity: -

(a) STP No -1 – 2.10 KL

(b) STP No--2 - 1.60 KL

The above Sewage Treatment Plants are maintained by S. Green Wastetech located at Gurugram, Haryana under Annual Maintenance Contact.

Waste generated from tree droppings and lawn management is a major solid waste generated in the campus. The waste is segregated at source by providing separate dustbins for Bio-degradable and Plastic waste. Single sided used papers are recommended for use for writing and printing in all departments.

Most of the official correspondence is through emails which has drastically reduced the use of papers.

Metal waste and wooden waste is stored and given to authorized scrap agents for further processing. The solid waste is collected by the municipal corporation and disposed by their methods.

b) Recommendations

- Make full use of all recycling facilities provided by City Municipality and private suppliers. Products such as glass, cans, white, coloured and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture needs to re-cycle.
- Important and confidential papers after their validity to be sent for pulping.
- Use reusable resources and containers and avoid unnecessary packaging where possible.
- Single used plastic may be banned, and paper glass and other recyclable items can be used in canteen and mess.

5.3 Green Area Management

This includes the plants, greenery, and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced, and reviewed using various environmental awareness programmes.

a) Observations

The University has maintained the existing and added to the land scape environment of the Campus. The layout of the land has not been disturbed and existing hill features have been

used for layout of the entire Campus. This has made the campus layout beautiful and has been appreciated by all dignities and visitors visiting the campus. Campus is in the vicinity of many trees (species) to maintain the biodiversity. Various tree plantation programs are being organized at university campus and surrounding villages through NSS (National Service Scheme) unit, ECO Club etc. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation program includes various types of indigenous species of ornamental, medicinal and multipurpose tree species (MPTS).

The University has installed Solar Power Plant 307 Kilo Watt capacity to save energy.

b) Recommendations

- Celebrate every year June 5th as 'World Environment Day' and plant trees on this day to make the campus Greener.
- Promote environmental awareness through scientific lectures, conferences, seminars, independent research projects, and community service.
- To review periodically the list of trees planted in the garden, allot numbers to the trees, and keep records. Assign scientific names to the trees.
- Ensure that an audit is conducted annually, and action is taken based on audit report, recommendation, and findings.
- Create awareness of environmental sustainability and take actions to ensure environmental sustainability inside the campus.

5.4 Eco-Club at the Campus

Eco-club of Amity University Madhya Pradesh, Gwalior has been constituted for spreading awareness among students, for generating knowledge about the environment and towards making clean and green campus. Eco-club is continuously organizing World Environment Day, tree plantation, educational tour, special lectures, and awareness programmes every year.

- Eco-Club has celebrated Earth Day on 22nd April 2018 through various awareness campaigning.
- Eco-Club has celebrated Tree Plantation ceremony on World Environment Day on 5th June 2018.
- Eco-club of AUMP introduced Recyclable Paper Box/Bins to stop the use of Plastic Dust Bins inside the campus as a part of Environmental Awareness.

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- Eco-club of AUMP organized Elocution Competition on Hariyali Mahotsav on 8 August 2017.

- Eco-club of AUMP regularly inform and aware students, staff, faculty members about the banned single used plastic bottles as a as a part of Environmental Awareness.

- Members of Eco-club became a part of "Jal Shakti Team" to aware people about water conservation in schools, colleges, villages.

- Members of Eco-club spread awareness through social media on World Ozone Day, 16 September 2017.

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6. Conclusions

The environmental awareness initiatives undertaken by the university in the ten years of its existence are substantial. The installation of solar panels as renewable/alternative source of energy and two units of STPs for waste management is noteworthy. Besides, environmental awareness programmes initiated by the administration/departments shows how the campus is going green. Few recommendations are added like installation of water harvesting system and more efficient waste management using eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus, thus sustainable environment, and community development.

As part of green audit of campus, we carried out the environmental monitoring of campus including illumination and ventilation of the classroom. It was observed that illumination and ventilation is adequate considering natural light and ICT facility are provided in all the Lecture Theatres and Classroom on need basis. In addition, WIFI is provided to the entire Campus including Hostels.

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7. 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)
- Energy Conservation Act 2010.
- The Water [Prevention & Control of Pollution] Act – 1974 (Amended 1988)
- The Air [Prevention & Control of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules – 1982
- 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

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Annexure 1

Green Audit Details

Year	**2017**	**2018**
Full-grown trees	957	1125
Semi-grown trees	667	980
Bushes (including floriculture plants)	422	2490
Lawn	60000	75000
Total no. of incandescent lamps used earlier	250	0
LED tube lights	60	900
Solar System	307 KW	307
Rainwater Harvesting Pits	10	10
compostable solid waste	4500 Kgs	5500
non-compostable waste	900 Kgs	1200
vermicompost	800	1200
Four wheelers	40	65
Two wheelers	159	220
Physical Structure		
Classrooms	70	70
Staff rooms	12	12
Laboratories	50	50
Conference halls	4	4
Libraries	4	4
Administrative Office	13	13

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Annexure 2

Tree Plantation

Environmental Awareness programme for Faculty & Satff member

Landscaping

Solar Panels

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AMITY UNIVERSITY
MADHYA PRADESH

GREEN AUDIT REPORT
(2018-2019)

Amity University Madhya Pradesh, Maharajpura Gwalior

(M.P.) – 474005, India

Tel No. 91- 751 - 2496021, Fax No. 91-751- 2496023
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Registrar
Amity University Madhya Pradesh
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4. Green Audit Assessment Team

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2.	Dr. Swapnil Rai Member	Associate Professor, Department of Environmental Science
3.	Dr Rwitabrata Mallick Member	Assistant Professor, Department of Environmental Science
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5. Observations and Recommendations

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- Reuse and recycle of water system is necessary. Although the waste water from the RO water purifier is used for gardening purpose, the scope can be increased to large scale re-cycling of water.
- Ensure that all cleaning products used by university staff have a minimal detrimental impact on the environment, i.e. they are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.
- Gardens should be watered by using drip/sprinkler irrigation system to maximize water use efficiency.
- Rain-water harvesting system needs to be installed in the campus. This will not only provide an additional source of water for use, it will help in recharging of the bore wells as well.

5.2 Waste Management

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Gwalior

The university has segregated waste into three parts:

- Solid Waste
- Liquid Waste
- e-Waste

Solid Waste: The waste is generated by all sorts of routine activities carried out in the University that includes paper, plastics, glass, metals, foods, etc. The waste is segregated at each level and source. The administrative supervisor in each block ensures that the waste in each floor is collected at designated time intervals. The block cleaning workers in each floor collect, clean, segregate and compile the waste in the dustbins (Green and Blue) provided at each floor. The floor dustbins are emptied in movable containers/dustbins provided for each block and is taken to the dumping yard provided by the University.

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The e-waste generated from hardware which cannot be reused or recycled is being disposed off centrally through government authorized vendors.

a) Observations

The waste management is well organized in the University. Two STPs have been installed with following capacity:-

(a) STP No -1 – 2.10 KL

(b) STP No--2 - 1.60 KL

These sewage Treatment Plant are being maintained by authorized agency/S Green Wastetech located at Gurgaon (HR) under AMC.

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b) Recommendations

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- Create awareness of environmental sustainability and take actions to ensure environmental sustainability inside the campus.
- Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings.
- Celebrate every year 5th June as 'Environment Day' and plant trees on this day to make the campus more Green.

5.4 Eco-Club at the Campus

Eco-club of Amity University Madhya Pradesh, Gwalior has been constituted for spreading awareness among students, for generating knowledge about the environment and towards making clean and green campus. Eco-club is continuously organising World Environment Day, tree plantation, educational tour, special lectures and awareness programmes every year.

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- Eco-Club has celebrated Tree Plantation ceremony on the occasion of World Environment Day on 5th June, 2019.
- Eco-club of AUMP introduced Recyclable Paper Box/Bins to stop the use of Plastic Dust Bins inside the campus as a part of Environmental Awareness.
- Eco-club of AUMP organized Elocution Competition on the occasion of Hariyali Mahotsav on 8 August 2019.
- Eco-club of AUMP regularly inform and aware students, staff, faculty members about the banned single used plastic bottles as a as a part of Environmental Awareness.
- Members of Eco-club became a part of "Jal Shakti Team" to aware people about water conservation in schools, colleges, villages.
- Members of Eco-club spread awareness through social media on the occasion of World Ozone Day, 16 September, 2019.

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6. Conclusions

The environmental awareness initiatives undertaken by the university in the ten years of its existence are substantial. The installation of solar panels as renewable/alternative source of energy and two units of STPs for waste management is noteworthy. Besides, environmental awareness programmes initiated by the administration/departments shows how the campus is going green. Few recommendations are added like installation of water harvesting system and more efficient waste management using eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus, thus sustainable environment and community development.

As part of green audit of campus, we carried out the environmental monitoring of campus including illumination and ventilation of the class room. It was observed that illumination and ventilation is adequate considering natural light and ICT facility are provided in all the Lecture Theatres and Class Room on need basis. In addition, WIFI is provided to the entire Campus including Hostels.

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7. 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)
- Energy Conservation Act 2010.
- The Water [Prevention & Control Of Pollution] Act – 1974 (Amended 1988)
- The Air [Prevention & Control Of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules – 1982
- 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

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Annexure 1

Year	**2018**
Full-grown trees	1125
Semi-grown trees	980
Bushes (including floriculture plants)	2490
Lawn	75000
Total no. of incandescent lamps used earlier	0
LED tube lights	900
Solar System	307
Rain water Harvesting Pits	10
compostable solid waste	5500
non-compostable waste	1200
vermicompost	1200
Four wheelers	65
Two wheelers	220
Physical Structure	
Class rooms	70
Staff rooms	12
Laboratories	50
Conference halls	4
Libraries	4
Administrative Office	13

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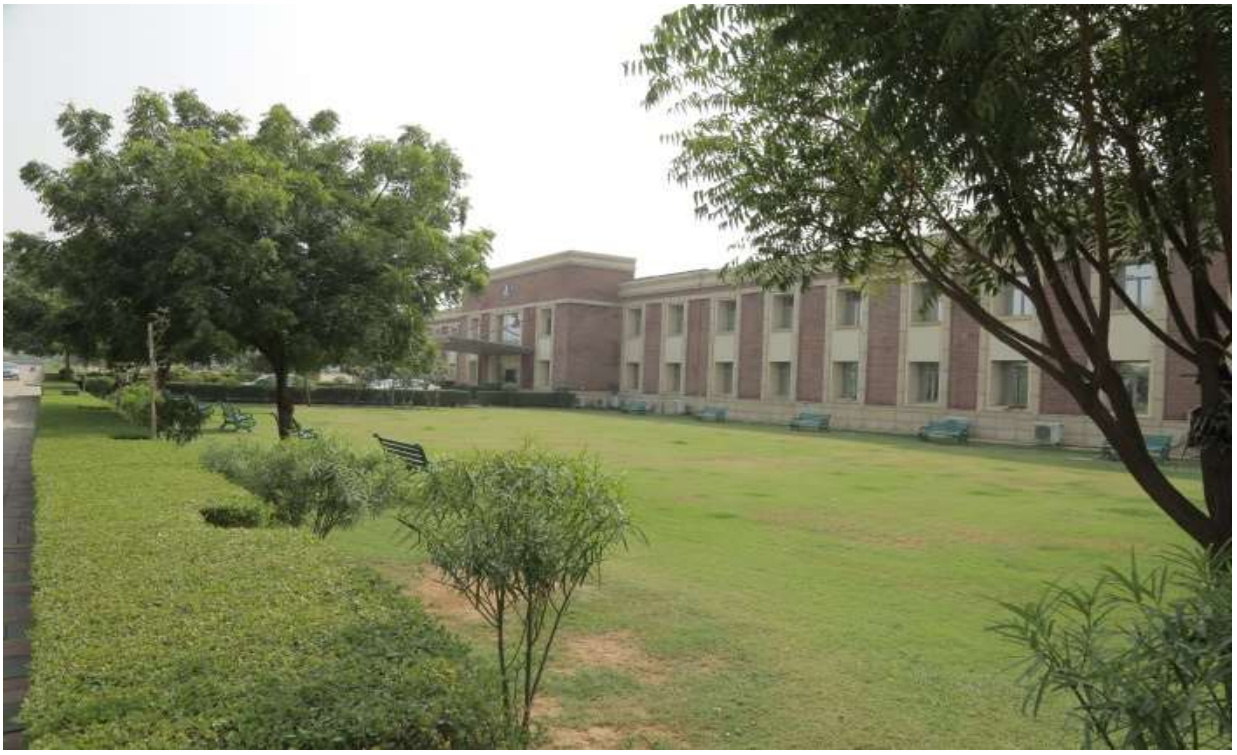
Annexure 2

Tree Plantation

Landscaping

Ornamental Plants



Lush Green Campus (A Block)

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Solar Panel

Introduction of Recyclable Waste Bin by Eco-Club

Tree Plantation

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GREEN AUDIT DETAILS

Year	2014	2015	2016	2017	2018
Full-grown trees	320	540	630	957	1125
Semi-grown trees	222	355	450	667	980
Bushes (including floriculture plants)	200	315	390	422	2490
Lawn	60000	60000	60000	60000	75000
Total no. of incandescent lamps used earlier	110	150	200	250	0
LED tube lights	0	0	0	60	900
Solar System	0	0	0	307 KW	307
Rain water Harvesting Pits	0	0	10	10	10
compostable solid waste	2200	3000	4000	4500 Kgs	5500
non-compostable waste	650	700	850	900 Kgs	1200
vermicompost	800	800	800	800	1200
Four wheelers	20	30	35	40	65
Two wheelers	130	140	150	159	220
Physical Structure					
Class rooms	21	70	70	70	70
Staff rooms	4	12	12	12	12
Laboratories	10	50	50	50	50
Conference halls	1	4	4	4	4
Libraries	1	4	4	4	4
Administrative Office	1	13	13	13	13

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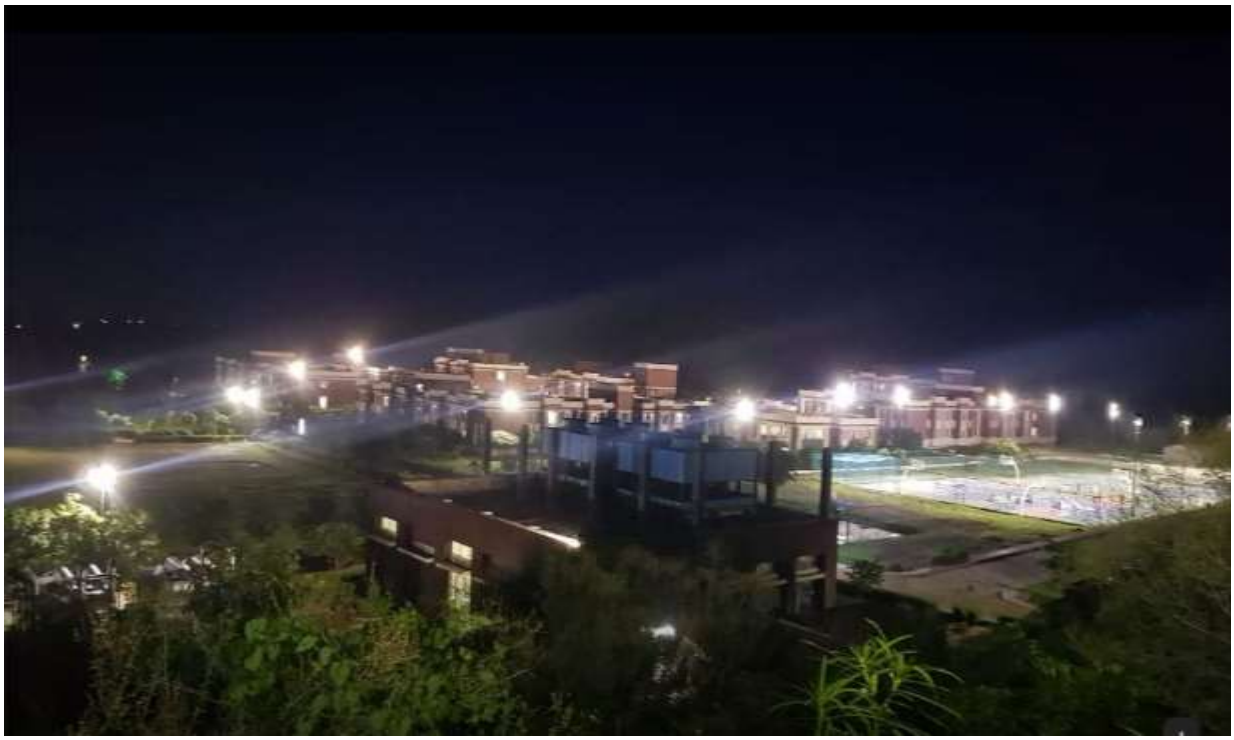
AMITY UNIVERSITY
MADHYA PRADESH
(Established by Ritnand Balved Education Foundation)

ENERGY AUDIT REPORT (2017-18)



Amity University Madhya Pradesh
Maharajpura, Gwalior (M.P.) – 474005, India
Tel No. 91- 751 - 2496021, Fax No. 91-751- 2496023
E-mail:info@gwa.amity.edu
Website: www.amity.edu/Gwalior

Registrar
Amity University Madhya Pradesh
Gwalior

Acknowledgement

The Energy Audit Assessment Team is thankful to the Lt. Gen. V. K. Sharma, AVSM (Retd.) Hon'ble Vice Chancellor, Amity University Madhya Pradesh, Gwalior for assigning the task of Energy Audit. We are also grateful to the administration, staff, faculty members and students for the support during the assessment work.

Our special thanks are due to:

- Pro Vice Chancellor AUMP
- Dy. Pro Vice Chancellor AUMP
- Registrar AUMP
- Director Administration, AUMP

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Registrar
Amity University Madhya Pradesh
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Gwalior

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Energy has been identified as a crucial and balancing factor in the indices for sustainable development since the Earth Summit in 1992. Especially in the contemporary scenario, it is acknowledged that the heavy and unbalanced energy consumption adversely affects energy price and economic growth, and most countries now give priority to energy conservation methods. The Energy Conservation Act, 2001, defines Energy Auditing as the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption.

It facilitates a systematic approach to the energy management in a system, trying to balance the total energy input with its use. It identifies all the energy streams in a system and quantifies the use of energy according to its discrete functions. It is a study to determine how and where energy is used, and to identify methods for energy savings. The Energy Auditing for a day is the index of the consumption which normalizes the situation of Energy crisis by providing the schemes for conservation of energy. The opportunities lie in the use of existing renewable energy technologies, greater efforts at energy efficiency and the dissemination of latest technologies

The energy audit of AUMP was carried out by the members of the Department of Environment on behalf of IQAC, under the supervision of the Energy Audit team. This report is our mite in contributing to the larger picture of effective energy management and conservation. As is known, energy auditing is an on-going process, a part of a larger procedure to ensure long-term sustainable development. We have enlisted plausible solutions based on the outcome of our analysis of data, and our recommendations, which can be implemented wholeheartedly in the campus to ensure minimizing energy waste and maximizing energy potential. We hope in all earnest that these will be given its due and that the audit will be fruitful in terms of energy conservation.

Registrar
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Amity University Madhya Pradesh was established in 2010. It is now a leading institute offering higher education in the state of Madhya Pradesh. The significant advances the University made in academic and research activities were matched with parallel improvements in the technical and infrastructure facilities of the campus, which makes it retain its position of excellence across time.

It has 10 institutes housed in 3 blocks of buildings spread across 110 acres. The vast campus and the large number of rooms being in use as classrooms and other facilities necessitated the implementation of a separate transformer for the college. The amount of the electricity bill was climbing steadily across the years.

The expansive network of cables was found to conflict with the growing branches of trees, and thus the entire electric cables were laid in underground ducts, which was in sync with environment protection also. This audit was undertaken to verify how effective these steps were, and also to identify loopholes, if any, in the existing practices, along with outlining measures for enhancing energy utilization.

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1.1 About the University

Amity University Madhya Pradesh was established by Ritnand Balved Education Foundation (RBEF) vide Madhya Pradesh Government Legislature Act of 2010 with the view to promote professional, industry-oriented education in the state of Madhya Pradesh. Amity University Madhya Pradesh, Gwalior located on a sprawling campus of 102 acres of land opposite Gwalior Airport, imparts modern, practical, and research-oriented courses which will lead to the development of professionals who are employable and industry ready. This in turn will drive the socio-economic upliftment of the region. Amity imparts education in almost all areas including management, engineering, architecture, biotechnology, law, communication, behavioural science, fine arts, fashion etc. Amity University Madhya Pradesh was adjudged the "Best Private University of Madhya Pradesh" by CMAI Association of India and has been accredited as "Premier University" by Accreditation Service for International Colleges (ASIC).

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2. Objectives

The Energy Audit Manual of the Energy Management Centre, Government of Madhya Pradesh, defines the primary objective of any energy audit as determining "ways to reduce energy consumption per unit of product output or to lower operating costs" (www.Madhya Pradeshenergy.gov.in). The recommendations of the study will become a basis for future schemes of better energy consumption and preservation throughout the organization.

Specific objectives of the study are:

- To verify the methods followed for energy management in AUMP campus.
- To calculate the inadequate practices if any.
- To improve energy conservation practices.
- To identify the areas for energy conservation.

3. Methodology

Energy audits are primarily classified into

- Preliminary Audit
- Detailed Audit

A Preliminary Audit uses existing data to look extensively at the existing energy consumption patterns and identifies the areas for improvement, sets “reference points”, and identifies areas for more in-depth study.

A Detailed Audit is more comprehensive and is carried out in phases, evaluating all major energy using systems. It estimates energy savings and cost, and accounts for the energy use of all major equipment.

Since the Detailed Audit is meant for industry, and because of the limited size and the amount of energy consumption of the institution, the Preliminary Audit method was chosen for this year.

ENERGY AUDIT TEAM

S.No	Name	Designation
1.	Dr Pankaj Mishra Chairman	Associate Professor Department of Physics Amity School of Engineering and Technology
2.	Dr Swapnil Rai Member	Assistant Professor, Department of Environmental Science
3.	Mr. Jitendra Singh Member	Electrical Engineer AUMP
4.	Mr. Umesh Kumar Sharma Secretary	Assistant Director Administration, AUMP

(Dr Pankaj Mishra) (Dr Swapnil Rai)

(Jitendra Singh) (Umesh Kumar Sharma)

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4. Data collection

For this audit, audit groups for specific areas were formed. Data was collected through

- Inspection and Observation
- Verification/ Identification of energy consumption
- Detailed calculations, analysis
- Validation

As a first step, the team outlined a timeframe for the project as follows:

- Forming Audit groups – July 2017
- Inspection and data collection – July 2017-June 2018
- Data analysis – June 2018
- Drafting of the report – July 2018
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This was strictly adhered to, and the work was completed in the stipulated time, the final report submitted to Hon'ble Vice Chancellor, AUMP in July 2018.

Division of work

- 2 teams of 5 members were formed and one faculty from the Energy Audit team was put in charge of the teams.

- Team 1 was put in charge of "Lighting" and team 2 was in charge of "Electrical equipment".

- They would gather the data under the guidance of the Energy Audit Team.

5. Data analysis

The gathered data was then quantified and segregated according to the following criteria:

1. Energy consumption by end use
2. Average energy use block-wise
3. Consumption equipment-wise
4. Rate of consumption month-wise
5. Rate of consumption timewise

6. Major findings

A.

- The laboratories record the highest consumption based on end use
- Laboratory equipment show the highest rate of consumption equipment-wise
- The months of May and June shows the peak in consumption
- The time slots in the afternoon record the highest consumption on a normal working day.

B.

- Old wiring cables in many parts of the campus leading to loss of energy
- Old water pipelines in several parts of the campus leading to waste of energy
- Use of incandescent bulbs in certain rooms
- Electric supply still depending on State Electricity Board, instead of solar panels
- Use of old equipment such as refrigerators in laboratories
- Uneven lighting facility – certain classrooms are under-illuminated, certain classes have more lights than required

C.

- Updating of technologies in laboratory equipment
- Replacing old electrical cables and pipelines
- Replacing incandescent bulbs with LEDs
- Ensuring even lighting facilities in rooms
- Use of Solar panels as a main source of lighting, especially common areas and grounds replacing old gadgets in laboratories

D.

- Replacing incandescent bulbs with LEDs
- Repairing and updating laboratory equipment
- Encouraging students and staff to switch off electrical gadgets and turn off the water taps when not in use

E.

- 1. Planning the electrical wiring more efficiently, doing away with unused power points and redundant electrical gadgets
- 2. Installing solar panels in possible buildings/ blocks

7. Recommendations

- Most of the power consumption is used for lighting, electric fans, computers and pumps.
- The heritage structure of buildings, with most of the rooms blessed with natural light and ventilation helps in reducing the number of lighting and ventilating equipment and gadgets.
- New buildings to be constructed should follow the pattern and assure natural light and air passage, to reduce loss of energy
- The electrical wiring of many buildings was found to be old and inefficient Replace old electrical cables with new ones Poor plumbing lines leads to loss of water and subsequent loss of power resulting from over Replace old pipelines with new ones, and latest motors for pumping water. pumping.
- There are several unused sockets and redundant power points causing power wastage.
- The number of sockets should be verified and ensured that only the good ones are being used. There seem to be a lack of judicious use of power among students and staff. During the study, it was found that lights, fans and computers were kept on working mode in many rooms, without a single person present. Students and staff should be exhorted constantly to use energy judiciously.
- Posters and pamphlets should be distributed and notices about saving energy should be posted at major points of use.
- Uneven distribution of lighting facilities. Certain classrooms were under-illuminated, while certain classrooms there seem to be more lights than necessary.
- Even lighting distribution system should be ensured.
- Many Dept. still use incandescent bulbs causing heavy power loss Incandescent bulbs should be replaced with LEDs; the entire power requirement is met from the MPEB line.
- More solar panels should be installed in key areas of the campus and loads for common areas and grounds should be met from these.
- AC, refrigerators and freezers used in many departments use obsolete technology and hence cause power loss.
- Gadgets and equipment should be repaired and/or replaced with latest ones to save energy.
- Surprisingly, it was found that power consumption is high in many locked buildings at night. This is probably due to locking the rooms without switching off gadgets. Proper switching off of the gadgets and equipment should be ensured strictly.

8. Conclusion

- A well-prepared electrical wiring plan for the campus, which would help identify unused points of power and in re-wiring the buildings
- Electric fans should be serviced, and bearings replaced wherever necessary
- The scope for non-conventional energy should be utilized.
- Installation of a suitable Bio-gas plant to save energy used for heating water in Science laboratories.
- Rigorous training for both students and staff to inculcate awareness for the need of energy conservation. If everyone ensures switching off lights, fans and electrical gadgets that are not in use, roughly 10% to15% of energy saving is possible
- A master switch located at a prominent place which can be directly supervised by the HoD/supervising staff would help avoid power wastage in closed rooms.
- A healthy competition may be encouraged between departments by honouring those departments that produce higher savings by good practices. An element of weight-based on the above lines may be considered for allocation of funds.
- It is suggested that a permanent body under the chairmanship of a senior teacher may be established in the University campus for periodical review of energy usage and concurrent energy audit.

Annexure 1

AMITY UNIVERSITY GWALIOR
Amity Power MANAGEMENT

AU, Gwalior

Month	Solar			MPEB			Without Solar			Approx. Saving Amount on Solar (Rs)	Approx. % of Saving on Solar
	Unit Generaed by Solar in KWH	Rate (Rs/KWh)	Payment to Clean Max Amount Rs	Units Received KWh	Unit cost of energy from MPEB (Rs)	Payment to MPEB Amount Rs	Unit Purchased from MPEB in KWh	Unit cost of energy from MPEB Rs	Amount		
Jan' 18	21675	4.80	104038.8	76800	17.20	1320742	98475	17.20	1693486	268705	15.87
Fab' 18	19873	4.80	95390.9	91900	15.38	1413262	111773	15.38	1718876	210223	12.23
Mar '18	26373	4.80	126590.4	120900	13.47	1628300	147273	13.47	1983496	228605	11.53
Apr' 18	24248	4.80	116388.2	219000	10.61	2324523	243248	10.61	2581893	140982	5.46
May'18	40202	4.80	192968.1	268000	9.88	2647861	308202	9.88	3045033	204225	6.71
Jun' 18	29720	4.80	142657.7	239300	10.10	2416759	269020	10.10	2717106	157518	5.80
Jul' 18	18994	4.80	91170.9	272600	9.99	2722068	291594	9.99	2913023	98579	3.38
Aug '18	18015	4.80	86473.2	259900	10.21	2654666	277915	10.21	2837515	97462	3.43
Sep' 18	20933	4.80	100477.8	257300	10.24	2633830	278233	10.24	2849105	113800	3.99
Oct' 18	27493	4.85	133341.1	244320	10.51	2568876	271813	10.51	2856755	155731	5.45
Nov '18	17656	4.85	85633.0	120730	13.87	1675071	138386	13.87	1919418	159339	8.30
Dec '18	20220	4.85	98067.8	87210	16.44	1433443	107430	16.44	1766152	234285	13.27
Total	**285402**	**4.80**	**1373197.8**	**2257960**	**11.27**	**25439401**	**2543362**	**11.36**	**28881856**	**2069454**	**7.17**

Note:-	**Avg bill p/m 2018 in Rs lacs (Jan'18 to Dec"18)**	**21.20**
	Avg bill p/m 2017 in Rs lacs (Jan'17 to Dec'17)	**21.82**
	Total Contacted load	**2100 KVA**
	Installed Solar Capacity	**307 Kwp**
	After Solar Installation Reduce MPEB bill amount avg. In 2018 (Approx)	**7%**

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Annexure 2

Power Profile	
Total Sanction Load	1600 KVA
Total Connected Load	1600 KVA
Total No of Transformers	2
Capacity of Transformers	3000 KVA
Total No of DG Set	5
4 nos 750 KVA	3000
1 nos 250 KVA	250
Total Capacity of DG Set	3250
Installed Solar Capacity	307 KWp

Consumption vs Chiller Consumption				
Year	**AU Total Consumption (MWH)**	**Chillers Total Consumption (MWH)**	**Consumption of chillers %**	**Remarks**
2017	2435	709.3	29	
2018	2574	723	28	

Year	**Details of Power Purchased from MPEB**				**Consumption & Generation of DG sets**				**Yearly Maintenance Expenditure Rs**		**Remarks**
	Units Received KWh	**Maximum Demand KVA**	**Payment to MPEB Rs**	**Per Unit cost of energy Rs/KWh**	**Units generated KWh**	**Quantity of diesel Lts**	**Cost of diesel Rs**	**Per Unit cost of energy Rs/KWh**	**Electrical Rs**	**DG Sets Rs**	
2017	2404900	1860	26192095	10.86	96838	32482	2008235	21	131900	522549	
2018	2257960	1812	25439401	11.27	128405	43349	3070642	24	30520	287528	

Solar Generation			
Year	**Unit Generated by Solar in KWH**	**Carbon Footprints saved in tonnes**	**Remarks**
2017	NIL	NIL	
2018	285401	24	

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Annexure 3

Fig 1: Solar Panels

Fig 2: HT Panel

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AMITY UNIVERSITY
MADHYA PRADESH

ENERGY AUDIT REPORT (2018-19)

Amity University Madhya Pradesh, Maharajpura Gwalior

(M.P.) – 474005, India

Tel No. 91- 751 - 2496021, Fax No. 91-751- 2496023
E-mail:info@gwa.amity.edu

Website: www.amity.edu/Gwalior

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Gwalior

Acknowledgement

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Registrar
Amity University Madhya Pradesh
Gwalior

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Amity University Madhya Pradesh
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- Verify the steps adopted for energy management in the campus
- Spot the inefficient or inadequate practices, if any
- Improve the energy preserving measures and methods
- Identify potential energy saving opportunities
- Formulate feasible steps and measures to be adopted in the campus

3. Methodology

Energy audits are primarily classified into

- Preliminary Audit
- Detailed Audit

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2.	Dr Pankaj Mishra	Associate Professor, Department of Physics, Amity School of Engineering and Technology (ASET)
3.	Dr Rwitabrata Mallick Member	Assistant Professor, Department of Environmental Science
4.	Mr. Jitendra Singh Member	Electrical Engineer AUMP
5.	Mr. Umesh Kumar Sharma Secretary	Assistant Director Administration, AUMP

(Prof. (Dr.) Raghvendra Sharma) (Dr Pankaj Mishra)

(Dr Rwitabrata Mallick) (Mr. Jitendra Singh) (Umesh Kumar Sharma)

Registrar
Amity University Madhya Pradesh
Gwalior

4. Data collection

For the purpose of this audit, audit groups for specific areas were formed. Data was collected through

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- Verification/ Identification of energy consumption
- Detailed calculations, analysis
- Validation

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- Team 1 was put in charge of "Lighting" and team 2 was in charge of "Electrical equipments".

- They would gather the data under the guidance of the Energy Audit Team.

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Gwalior

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2. Average energy use block-wise
3. Consumption equipment-wise
4. Rate of consumption month-wise
5. Rate of consumption time-wise

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A.

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- Laboratory equipment show the highest rate of consumption equipment-wise
- The months of May and June shows the peak in consumption
- The time slots in the Afternoon record the highest consumption on a normal working day.

B.

- Old wiring cables in many parts of the campus leading to loss of energy
- Old water pipelines in several parts of the campus leading to waste of energy
- Use of incandescent bulbs in certain rooms
- Electric supply still depending on State Electricity Board, instead of solar panels
- Use of old equipment such as refrigerators in laboratories
- Uneven lighting facility – certain classrooms are under-illuminated, certain classes have more lights than required

C.

- Updating of technologies in laboratory equipment
- Replacing old electrical cables and pipelines
- Replacing incandescent bulbs with LEDs
- Ensuring even lighting facilities in rooms
- Use of Solar panels as a main source of lighting, especially common areas and grounds replacing old gadgets in laboratories

D.

- Replacing incandescent bulbs with LEDs
- Repairing and updating laboratory equipment
- Encouraging students and staff to switch off electrical gadgets and turn off the water taps when not in use

E.

- 1. Planning the electrical wiring more efficiently, doing away with unused power points and redundant electrical gadgets
- 2. More enhancement of the solar panels in possible new buildings/ blocks/unutilized areas.

7. Recommendations

- Most of the power consumption is used for lighting, electric fans, computers and pumps.
- The heritage structure of buildings, with most of the rooms blessed with natural light and ventilation helps in reducing the number of lighting and ventilating equipment and gadgets.
- New buildings to be constructed should follow the pattern and assure natural light and air passage, to reduce loss of energy
- The electrical wiring of many buildings was found to be old and inefficient Replace old electrical cables with new ones Poor plumbing lines leads to loss of water and subsequent loss of power resulting from over Replace old pipelines with new ones, and latest motors for pumping water. pumping.
- There are several unused sockets and redundant power points causing power wastage.
- The number of sockets should be verified and ensured that only the good ones are being used. There seem to be a lack of judicious use of power among students and staff. During the study, it was found that lights, fans and computers were kept on working mode in many rooms, without a single person present. Students and staff should be exhorted constantly to use energy judiciously.
- Posters and pamphlets should be distributed and notices about saving energy should be posted at major points of use.
- Uneven distribution of lighting facilities. Certain classrooms were under-illuminated, while certain classrooms there seem to be more lights than necessary.
- Even lighting distribution system should be ensured.
- Many Dept. still use incandescent bulbs causing heavy power loss Incandescent bulbs should be replaced with LEDs; the entire power requirement is met from the MPEB line.
- More solar panels should be installed in key areas of the campus and loads for common areas and grounds should be met from these.
- AC, refrigerators and freezers used in many departments use obsolete technology and hence cause power loss.
- Gadgets and equipment should be repaired and/or replaced with latest ones to save energy.
- Surprisingly, it was found that power consumption is high in many locked buildings at night. This is probably due to locking the rooms without switching off gadgets. Proper switching off of the gadgets and equipment should be ensured strictly.

8. Conclusion

- A well-prepared electrical wiring plan for the campus, which would help identify unused points of power and in re-wiring the buildings
- Electric fans should be serviced and bearings replaced wherever necessary
- The scope for non-conventional energy should be utilized.
- Installation of a suitable Bio-gas plant to save energy used for heating water in Science laboratories.
- Rigorous training for both students and staff to inculcate awareness for the need of energy conservation. If everyone ensures switching off lights, fans and electrical gadgets that are not in use, roughly 10% to15% of energy saving is possible
- A master switch located at a prominent place which can be directly supervised by the HoD/supervising staff would help avoid power wastage in closed rooms.
- A healthy competition may be encouraged between departments by honouring those departments that produce higher savings by good practices. An element of weight-based on the above lines may be considered for allocation of funds.
- It is suggested that a permanent body under the chairmanship of a senior teacher may be established in the University campus for periodical review of energy usage and concurrent energy audit.

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Gwalior

Annexure 1

AMITY UNIVERSITY GWALIOR
Amity Power MANAGEMENT

AU, Gwalior

Month	Solar			MPEB			Without Solar			Approx. Saving Amount on Solar (Rs)	Approx. % of Saving on Solar
	Unit Generaed by Solar in KWH	Rate (Rs/KWh)	Payment to Clean Max Amount Rs	Units Received KWh	Unit cost of energy from MPEB (Rs)	Payment to MPEB Amount Rs	Unit Purchased from MPEB in KWh	Unit cost of energy from MPEB Rs	Amount		
Jan' 18	21675	4.80	104038.8	76800	17.20	1320742	98475	17.20	1693486	268705	15.87
Fab' 18	19873	4.80	95390.9	91900	15.38	1413262	111773	15.38	1718876	210223	12.23
Mar '18	26373	4.80	126590.4	120900	13.47	1628300	147273	13.47	1983496	228605	11.53
Apr' 18	24248	4.80	116388.2	219000	10.61	2324523	243248	10.61	2581893	140982	5.46
May'18	40202	4.80	192968.1	268000	9.88	2647861	308202	9.88	3045033	204225	6.71
Jun' 18	29720	4.80	142657.7	239300	10.10	2416759	269020	10.10	2717106	157518	5.80
Jul' 18	18994	4.80	91170.9	272600	9.99	2722068	291594	9.99	2913023	98579	3.38
Aug '18	18015	4.80	86473.2	259900	10.21	2654666	277915	10.21	2837515	97462	3.43
Sep' 18	20933	4.80	100477.8	257300	10.24	2633830	278233	10.24	2849105	113800	3.99
Oct' 18	27493	4.85	133341.1	244320	10.51	2568876	271813	10.51	2856755	155731	5.45
Nov '18	17656	4.85	85633.0	120730	13.87	1675071	138386	13.87	1919418	159339	8.30
Dec '18	20220	4.85	98067.8	87210	16.44	1433443	107430	16.44	1766152	234285	13.27
Total	**285402**	**4.80**	**1373197.8**	**2257960**	**11.27**	**25439401**	**2543362**	**11.36**	**28881856**	**2069454**	**7.17**

Note:-		
	Avg bill p/m 2018 in Rs lacs (Jan'18 to Dec"18)	21.20
	Avg bill p/m 2017 in Rs lacs (Jan'17 to Dec'17)	21.82
	Total Contacted load	2100 KVA
	Installed Solar Capacity	307 Kwp
	After Solar Installation Reduce MPEB bill amount avg. In 2018 (Approx)	7%

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AMITY UNIVERSITY GWALIOR
Amity Power MANAGEMENT

AU, Gwalior

Month	Solar			MPEB			Without Solar			Approx. Saving Amount on Solar (Rs)	Approx. % of Saving on Solar
	Unit Generated by Solar in KWH	Rate (Rs/KWh)	Payment to Clean Max Amount Rs	Units Received KWh	Unit cost of energy from MPEB (Rs)	Payment to MPEB Amount Rs	Unit Purchased from MPEB in KWh	Unit cost of energy from MPEB Rs	Amount		
Jan'19	22512	4.85	109183	91900	15.63	1435992	114412	15.63	1787755	242580	13.57
Fab'19	25077	4.85	121623	99840	14.90	1487207	124917	14.90	1860752	251921	13.54
Mar'19	26532	4.85	128682	79980	16.98	1357810	106512	16.98	1808248	321755	17.79
Apr'19	51677	4.85	250632	227050	10.56	2396634	278727	10.56	2942110	294843	10.02
May'19	49218	4.85	238707	270230	9.99	2699478	319448	9.99	3191143	252958	7.93
Jun'19	39967	4.85	193839	229300	10.60	2431247	269267	10.60	2855012	229926	8.05
Jul'19	37394	4.85	181362	276510	10.08	2787663	313904	10.08	3164657	195632	6.18
Aug'19	30416	4.85	147519	291120	10.06	2930023	321536	10.06	3236152	158610	4.90
Sep'19	30681	4.85	148803	269760	10.83	2921324	300441	10.83	3253580	183453	5.64
Oct'19	33407	4.85	162026	215110	11.69	2514280	248517	11.69	2904758	228452	7.86
Nov'19	23861	4.90	116919	122140	14.43	1762776	146001	14.43	2107149	227454	10.79
Dec'19	21711	4.90	106382	92210	16.76	1545314	113921	16.76	1909153	257458	13.49
Total	**392454**	**4.85**	**1905678**	**2265150.0**	**11.60**	**26269748**	**2657604**	**11.67**	**31020468**	**2845042**	**9.17**

Note:-		
	Avg bill p/m 2019 in Rs lacs (Jan'19 to Dec"19)	21.89
	Avg bill p/m 2018 in Rs lacs (Jan'18 to Dec'18)	21.20
	Total Contacted load	2100 KVA
	Installed Solar Capacity	307 Kwp
	After Solar Installation Reduce MPEB bill amount avg. In 2019 (Approx)	9%

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Annexure 2

Power Profile	
Total Sanction Load	1600 KVA
Total Connected Load	1600 KVA
Total No of Transformers	2
Capacity of Transformers	3000 KVA
Total No of DG Set	5
4 nos 750 KVA	3000
1 nos 250 KVA	250
Total Capacity of DG Set	3250
Installed Solar Capacity	307 KWp

Consumption vs Chiller Consumption				
Year	AU Total Consumption (MWH)	Chillers Total Consumption (MWH)	Consumption of chillers %	Remarks
2018	2574	723	28	
2019	2683	702	26	

Year	Details of Power Purchased from MPEB				Consumption & Generation of DG sets				Yearly Maintenance Expenditure Rs		Remarks
	Units Received KWh	Maximum Demand KVA	Payment to MPEB Rs	Per Unit cost of energy Rs/KWh	Units generated KWh	Quantity of diesel Lts	Cost of diesel Rs	Per Unit cost of energy Rs/KWh	Electrical Rs	DG Sets Rs	
2018	2257960	1812	25439401	11.27	128405	43349	3070642	24	30520	287528	
2019	2265150	1868	26269748	11.60	132465	43073	2953235	22	8773	271908.51	

Solar Generation			
Year	Unit Generaed by Solar in KWH	Carbon Footprints saved in tonnes	Remaks
2018	285401	24	
2019	392453	33	

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Annexure 3

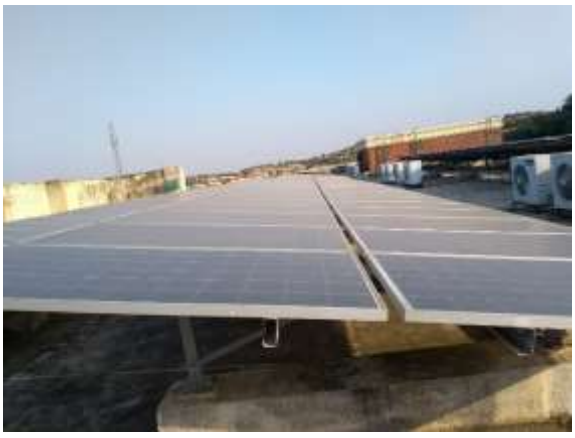

Fig 1: Solar Panels

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Fig 2: DG Set

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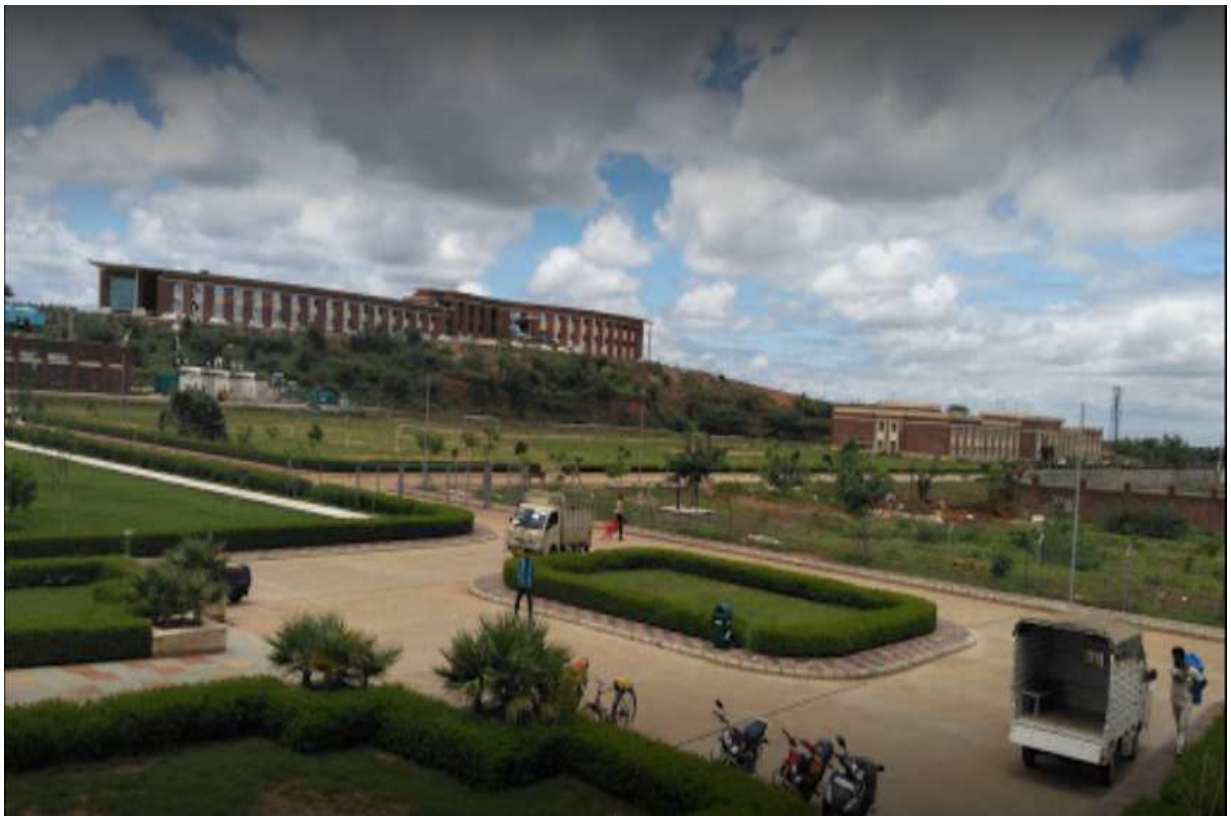
AMITY UNIVERSITY
MADHYA PRADESH
(Established by Ritnand Balved Education Foundation)

ENVIRONMENTAL AUDIT REPORT
(2017-2018)



Amity University Madhya Pradesh
Maharajpura, Gwalior (M.P.) – 474005, India
Tel No. 91- 751 - 2496021, Fax No. 91-751- 2496023
E-mail:info@gwa.amity.edu
Website: www.amity.edu/Gwalior

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Gwalior

Acknowledgement

The Environmental Audit Assessment Team is thankful to the Lt. Gen. V. K. Sharma, AVSM (Retd.) Hon'ble Vice Chancellor, Amity University Madhya Pradesh, Gwalior for assigning the task of Environmental Audit. We are also grateful to the administration, staff, faculty members and students for the support during the assessment work.

Our special thanks are due to:

- Pro Vice Chancellor AUMP
- Dy. Pro Vice Chancellor AUMP
- Registrar AUMP
- Director Administration, AUMP

For giving us necessary guidance and inputs to carry out this very important exercise of Environment Audit.

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Executive Summary

An environmental audit is a type of evaluation intended to identify environmental compliance and management system implementation gaps, along with related corrective actions. In its pursuit for improving environmental quality and to maintain a pristine environment for the future generation of students, Amity University Madhya Pradesh, Gwalior has made a self-inquiry on environmental quality of the campus with the following main objectives:

- The purpose of the audit is to make sure that the practices followed in the campus are environment friendly.
- The specific objectives of the audit are to evaluate the compliance with the applicable regulations, policies, and standards to ensure that the development of the campus foster to the concept of environmental sustainability.
- To identify gaps and suggest recommendations to improve the environment quality status of the institution.

The methodology included physical inspection of the campus, observation, and review of the documentation, interviewing key persons and data analysis, measurements, and recommendations. It works on the several facets of 'Environmental conservation and sustainability' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity. With this in mind, the specific objectives of the audit was to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the Institutions/Departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on student health, learning outcome, operational costs and the environment. The criteria, methods and recommendations used in the audit were based on the identified risks.

This report is compiled by a committee constituted by the university. As there was no standard model for such an environment/green audit of campuses in the state, the committee with the help of the staff/student volunteers who are part of the ECO Club, the major part of the data was compiled, which the committee analyzed. The remaining part which involved measurement of quality was entrusted with the Department of Environmental Sciences. The committee has made short term and long-term suggestions to take environment protection to higher levels and it is hoped that this will receive due attention of University authorities and also all stake-holders of the University.

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1. Introduction

Environmental Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Environmental Audit' aims to analyse environmental practices within and outside the university campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. Through Environmental Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out such Audit.

1.1 About the University

Amity University Madhya Pradesh was established by Ritnand Balved Education Foundation (RBEF) vide Madhya Pradesh Government Legislature Act of 2010 with the view to promote professional, industry-oriented education in the state of Madhya Pradesh. Amity University Madhya Pradesh, Gwalior located on a sprawling campus of 102 acres of land opposite Gwalior Airport, imparts modern, practical and research-oriented courses which will lead to the development of professionals who are employable and industry ready. This in turn will drive the socio-economic upliftment of the region. Amity imparts education in almost all areas including management, engineering, architecture, biotechnology, law, communication, behavioral science, fine arts, fashion etc. Amity University Madhya Pradesh was adjudged the "Best Private University of Madhya Pradesh" by CMAI Association of India and has been accredited as "Premier University" by Accreditation Service for International Colleges (ASIC).

The University has one N.S.S. units sanctioned by the university, which are doing tremendous job through organizing activities like blood donations, tree plantations, health check-up, personality development etc. are conducted by this unit.

2. Objectives of the Study

The main objective of the environment audit is to promote the Environment Management and Conservation in the University Campus. The purpose of the audit is to identify, quantify, describe, and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies, and standards. The main objectives of carrying out Green Audit are:

- To create an awareness among the students to develop belonginess for the

environment.

- To promote the concept of sustainable development to minimize the exploitation of natural resources.
- To ensure that the development of the campus foster to the concept of environmental sustainability.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requiring high cost.
- To bring out a status report on environmental compliance.

3. Methodology

To perform environment audit, the methodology included different tools such as physical inspection of the campus, observation, and review of the documentation, interviewing key persons and data analysis, measurements, and recommendations. The study covered the following areas to summarize the present status of environment management in the campus:

Type text here

- Biodiversity conservation
- Water management
- Solid Waste management
- Green area management
- Campus facility and ambience

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4. Environment Audit Assessment Team

S.No	Name	Designation
1.	Prof. (Dr.) S. P Bajpai Chairman	HOI, Department of Environmental Science (EVS)
2.	Dr Swapnil Rai Member	Assistant Professor, Department of Environmental Science
3.	Dr Pankaj Mishra Member	Associate Professor, Amity School of Engineering & Technology (ASET)
4.	Mr. Umesh Kumar Sharma Secretary	Assistant Director Administration, AUMP

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5. Observations and Recommendations

The findings of the audit show that students, faculty members and staff of all institutions are aware about the importance of environmental conservation. It was also found that that best practices for the environmentally friendly campus such as plastic free campus, plantation, maintenance of garden area, solid waste management etc. are followed in the campus.

5.1 Biodiversity conservation:

The practices for the conservation of biodiversity are well adopted in the campus. This is done by planting local tree species, arranging food, and shed for the birds. This indicator addresses the extent of flora and fauna inside the campus and initiatives adopted by the University for maintenance and conservation. The different types of species of plants growing naturally and planted to provide sustainability to the man-made ecosystem.

A) Observations:

The university campus is lush green with plantations of ornamental plants, trees, shrubs, and herbaceous species. It has a well-maintained gardens and lawns.

Regular plantation of different types of plants is undertaken on important occasions like "World Environment Day, Raising day with the participation of staff and students.

The lush green campus of the environment is attracting the migratory bird particularly during the winter seasons. Adequate arrangements have been made to provide water and feed to the birds.

A botanical garden with about 50 species of medicinal plants has been set and will be upgraded.

b) Recommendations:

- Botanical garden may be expended with plants of ethnobotanical & medicinal importance
- Awareness programs and conferences should be organized to create an awareness among students and others for the need to conserve biodiversity and encourage plantation of multipurpose tree species with high carbon sequestration potential.

5.2 Water Management

This indicator addresses water consumption, water sources, and fixtures. A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

a) Observations

The University is presently dependent on Borewells which are presently 10 in numbers. The water is hard with average prevailing TDS 1800. However, soft water plant with capacity of 30 KL of ION EXCHANGE is installed in the Campus to improve the quality of water.

In addition, for drinking water 24 Nos of 50 litre capacity RO are fitted in the entire campus. They are regularly maintained under AMC. In addition to above application for water supply has been forwarded to Nagar Nigam, Gwalior for supply of water with overall cost for laying dedicated pipelines amounting to Rs 67 lakh has been deposited by the University. The work is yet to be completed.

Water is used for drinking purpose, toilets, and gardening. During the survey, no loss of water is observed, neither by any leakages, nor by overflow of water from overhead tanks. The data collected from all the departments is examined and verified. Water quality is enhanced by using soft water plant of ION exchange of capacity 30 KL and ROs of 50 liter in 24 Nos are installed in the Campus to provide potable water.

b) Recommendations

- Reuse and recycle of water system are necessary. Although the wastewater from the RO water purifier is used for gardening purpose, the scope can be increased to large scale re-cycling of water.
- Gardens should be watered by using drip/sprinkler irrigation system to maximize water use efficiency.
- Rainwater harvesting system needs to be installed in the campus. This will not only provide an additional source of water for use, but it will also help in recharging of the bore wells as well.
- The regular maintenance for all the drainage system and supply pipes should be adopted to avoid the wastage of water.

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5.3 Waste Management

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be processed through recycling, repair, and reuse. Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threats to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus.

a) Observations

The waste management is well organized in the University. Two STPs have been installed with following capacity: -

(a) STP No -1 – 2.10 KL

(b) STP No--2 - 1.60 KL

These sewage Treatment Plant are being maintained by authorized agency/S Green Wastetech located at Gurgoan (HR) under AMC.

Waste generated from tree droppings and lawn management is a major solid waste generated in the campus. The waste is segregated at source by providing separate dustbins for Bio-degradable and Plastic waste. Single sided used papers are recommended for use for writing and printing in all departments.

Most of the official correspondence is through emails which has drastically reduced the use of papers.

Metal waste and wooden waste is stored and given to authorized scrap agents for further processing. The solid waste is collected by the municipal corporation and disposed by their methods.

b) Recommendations

- Make full use of all recycling facilities provided by City Municipality and private suppliers. Products such as glass, cans, white, coloured and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture needs to re-cycle.
- Important and confidential papers after their validity to be sent for pulping.

- Use reusable resources and containers and avoid unnecessary packaging where possible.

5.4 Green Area Management

This includes the plants, greenery, and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced, and reviewed using various environmental awareness programmes.

a) Observations

The University has maintained the existing and added to the land scape environment of the Campus. The layout of the land has not been disturbed and existing hill features have been used for layout of the entire Campus. This has made the campus layout beautiful and has been appreciated by all dignities and visitors visiting the campus. Campus is located in the vicinity of many trees (species) to maintain the biodiversity. Various tree plantation programs are being organized at university campus and surrounding villages through NSS (National Service Scheme) unit, ECO Club etc. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation program includes various types of indigenous species of ornamental, medicinal and multipurpose tree species (MPTS).

The University has installed Solar Power Plant of 307-Kilowatt capacity to save energy. This likely to be enhanced further.

b) Recommendations

- Promote environmental awareness through scientific lectures, conferences, seminars, independent research projects, and community service.
- Create awareness of environmental sustainability and take actions to ensure environmental sustainability inside the campus.
- To review periodically the list of trees planted in the garden, allot numbers to the trees, and keep records.
- Ensure that an audit is conducted annually, and action is taken based on audit report, recommendation, and findings.
- Celebrate every year June 5th as 'Environment Day' and plant trees on this day to make the campus Greener.

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5.5 Rainwater harvesting in the campus

1. Amity University Madhya Pradesh was established in the year 2011 in 102 Acre of land. The requirement of water for the campus is being met by digging 10 Nos of Borewells as no water from Nagar Nigam is being supplied.
2. The borewells dug in the campus have not enough ground water to yield water continuously. Half numbers of the borewells dry up during continuous pumping. To recharge these existing borewells and to restrict the out-flow of rainwater. Amity University arranged to construct 10 Nos of Water Harvesting Pits of capacity 30,000 ltrs at various location (Water Catchment Area) to conserve rainwater. These pits have been provided enough filter media to restrict the mud/silt during rains.
3. This has also been applauded by Hon'ble High Court Gwalior MP. Local Newspaper cuttings are attached for ref.
4. The above has brought sea change in saving of rainwater and has thus improved the water level, of our borewells which helps us in meeting our water requirement in peak summers.

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6. Conclusions

The environmental awareness initiatives undertaken by the university in the ten years of its existence are substantial. The installation of solar panels as renewable/alternative source of energy and two units of STPs for waste management is noteworthy. Besides, environmental awareness programmes initiated by the administration/departments shows how the campus is going green. Few recommendations are added like installation of water harvesting system and more efficient waste management using eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus, thus fostering sustainable environment and community development.

As part of environment audit of campus, we carried out the environmental monitoring of campus including illumination and ventilation of the classroom. It was observed that illumination and ventilation is adequate considering natural light and ICT facility are provided in all the Lecture Theatres and Classroom on need basis. In addition, WIFI is provided to the entire Campus including Hostels.

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7. 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)
- Energy Conservation Act 2010.
- The Water [Prevention & Control Of Pollution] Act – 1974 (Amended 1988)
- The Air [Prevention & Control Of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules – 1982
- 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

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Annexure 1

Particulars of flora inside the campus

DETAILS OF TREE GROWN NATURALLY

Name of Plant	Neem	Dakhsni	Gulmohar	Peepal	Sheesham	Raimaza	Khair	Heesh	Babul Desi	Ber	Anar	Churail	Hingota	Ghot	Kareel	Shesho	Total
Location	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	
Foresty																	
Block-A to Pump House No-1	164	115	78	4	5	140	377	54	8	6	2	5					958
Main Gate To Block-B(Back side)	222	412	16	2	17	291	553	65	9	10	1	11	254				1863
Block-C to Pump House No-2	99	885	18		3	267	99	26	30	11			25	2	52		1517
Pump House No-2 to Security Post	27	124				91	162	32	4	4			17	9	3		473
STP No-1 Area	20	31			3	3			1	4							62
Security Post to New Hostel	120	188	11		3	402	471	535	5	5		5	58	198	6		2007
New Hostel to Partition Zali	320	284	60		9	87	1285	473	18	5		4	274	37	11	18	2885
Total	**972**	**2039**	**183**	**6**	**40**	**1281**	**2947**	**1185**	**75**	**45**	**3**	**25**	**628**	**246**	**72**	**18**	**9765**

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Annexure 2

AMITY UNIVERSITY MADHYA PRADESH, GWALIOR

DETAILS OF TREE PLANTED

Name of Plant	Amaltas	Gulmohar	Kusnum	Boganbolia	Kanair	Neem	Sheesham	Kanji	Mausmree	Arjun	Champa	Cycus	Alustinia	Ficoma	Bottle Brush	Bargad	Peepal	Kadam	Kalendera	Dhak	Dalmoth	Gomar	Palm	Alustonia	Bustomiya	Ambia	Shantoot	Total
Location	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
Main gate to Block-A Jn trench side	10	9	9	161	2	44	8	10	1																			254
Main gate to Block-A Jn bundry side	10	8	6	144	6	20	4	3																				201
Black-A to Hostel gate sport Gd side	45	1			70	26	6			23	82	32	2	6	1	1	3	1										299
Black-A to Hostel gate Boundry side	1			122	11	84	13			3	43		24	4			3											308
Behind Block-A		5		2	18	40			1											10	2							78
BK-B/C Jn to BK-A Turning Hill side				90	33	3	3		10	17	88			19					22			1						286
BK-B/C Jn to BK-A Turning BK-B side				55	60	10			1	6	47			28					12									219
Behind Block-B																							13					13
BK-C Front side		4		68	105	30	4					12		10					4				8					245
Behind BK-C		6				28	7																					41
Chiller Plant to Bk-C Jn Chiller side			3	33	63	10				7	19			2					4									141
Chiller Plant to Bk-C Jn Ahuja side	7			15	43	6	2	2		37	21		22	15				14	4									188
Generator side					38					8		1																47

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Alustonia Park	3			30			3	1		2													14				53
Hostel JN to H1 Reception Hostel side	12	6		1	74	6	1	12	1		12			9						9					21			164
Hostel JN to H1 Reception STP side	14	4			10	21				3				7										12				71
AIS Gate to H1 Reception Fencing side					5	14				19								2										40
Hostel Plaza Area H1 side		2			19			2			104										2				27			156
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H2 Hostel Sport Complex side	8	10			9									2					2									31
Main Gate to Pump House No-2	36		4	123		17	5			51						1	1			8								246
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On 16 Jul 19 by Order of Ho'ble Governer at various locations																	20											20
Total	**158**	**67**	**22**	**1478**	**727**	**603**	**193**	**44**	**14**	**176**	**521**	**64**	**48**	**113**	**1**	**2**	**37**	**17**	**49**	**89**	**12**	**1**	**28**	**27**	**99**	**1**	**1**	**4592**

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Annexure 3

Rainwater Harvesting pits at different locations in the campus

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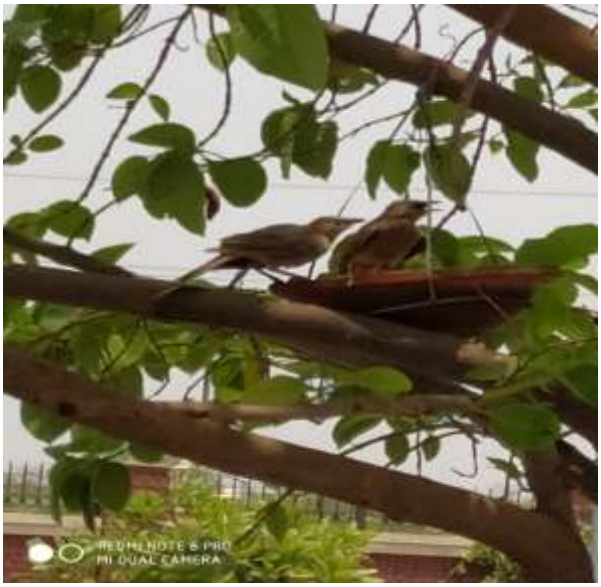
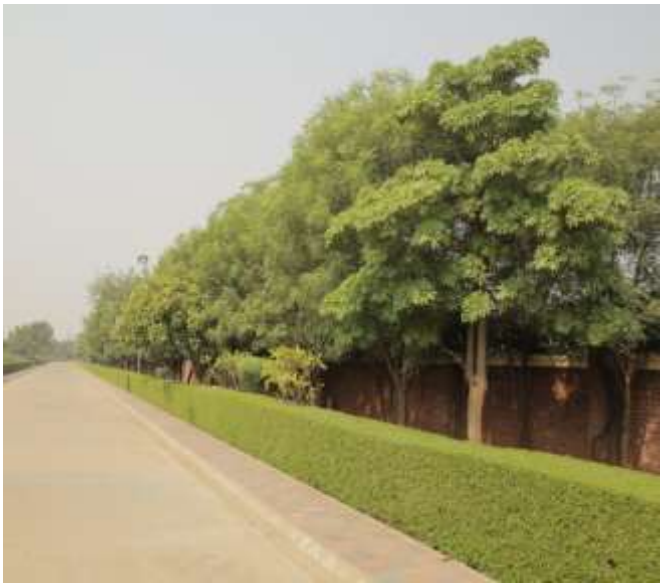
Annexure 4

Tree Plantation at the Campus



Bird habitat at Campus



Landscaping

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Annexure 5

Sewage Treatment Plants (STP) at the campus

Solid Waste Management

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Annexure 6

Campus View with Vegetation

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ENVIRONMENT AUDITREPORT
(2018-2019)

Amity University Madhya Pradesh, Maharajpura Gwalior

(M.P.) – 474005, India

Tel No. 91- 751 - 2496021, Fax No. 91-751- 2496023
E-mail:info@gwa.amity.edu

Website: www.amity.edu/Gwalior

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Acknowledgement

Environment Audit Assessment Team thanks the Hon'ble Vice Chancellor Amity University Madhya Pradesh for assigning this important work of Environment Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to:

- Pro Vice Chancellor AUMP
- Dy. Pro Vice Chancellor AUMP
- Registrar AUMP
- Director Administration, AUMP

For giving us necessary guidance and inputs to carry out this very important exercise of Environment Audit.

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Table of Content

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Executive Summary

Concern about environmental degradation and realization of values of environment are logical consequences of scholarly research, teaching and learning process. In its pursuit for improving environmental quality and to maintain a pristine environment for the future generation of students, Amity University Madhya Pradesh, Gwalior has made a self-inquiry on environmental quality of the campus with the following main objectives:

- The purpose of the audit is to make sure that the practices followed in the campus are environment friendly.
- The specific objectives of the audit are to evaluate the compliance with the applicable regulations, policies and standards to ensure that the development of the campus foster to the concept of environmental sustainability.
- To assess whether investments made in increasing awareness among students regarding electricity, biodiversity and environment have helped the Institution
- To identify gaps and suggest recommendations to improve the environment quality status of the institution.

The methodology included physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. It works on the several facets of 'Environmental conservation and sustainability' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity. With this in mind, the specific objectives of the audit was to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the Institutions/Departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on student health, learning outcome, operational costs and the environment. The criteria, methods and recommendations used in the audit were based on the identified risks.

This report is compiled by a committee constituted by the university. As there was no standard model for such an environment/green audit of campuses in the state, the committee with the help of the staff/student volunteers who are part of the ECO Club, the major part of the data was compiled, which the committee analyzed. The remaining part which involved measurement of quality was entrusted with the Department of Environmental Sciences. The committee has made short term and long term suggestions to take environment protection to higher levels and it is hoped that this will receive due attention of University authorities and also all stake-holders of the University

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1. Introduction

Environmental Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Environmental Audit' aims to analyse environmental practices within and outside the university campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. Through Environmental Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out such Audit.

Environmental audit is assigned to the criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India which declares the institutions as Grade A, B or C according to the scores assigned during the accreditation.

1.1 About the University

Amity University Madhya Pradesh was established by Ritnand Balved Education Foundation (RBEF) vide Madhya Pradesh Government Legislature Act of 2010 with the view to promote professional, industry-oriented education in the state of Madhya Pradesh. Amity University Madhya Pradesh, Gwalior located on a sprawling campus of 102 acres of land opposite Gwalior Airport, imparts modern, practical and research-oriented courses which will lead to the development of professionals who are employable and industry ready. This in turn will drive the socio-economic upliftment of the region. Amity imparts education in almost all areas including management, engineering, architecture, biotechnology, law, communication, behavioral science, fine arts, fashion etc. Amity University Madhya Pradesh was adjudged the "Best Private University of Madhya Pradesh" by CMAI Association of India and has been accredited as "Premier University" by Accreditation Service for International Colleges (ASIC).

The University has one N.S.S. units sanctioned by the university, which are doing tremendous job through organizing activities like blood donations, tree plantations, health check-up, personality development etc. are conducted by this unit.

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2. Objectives of the Study

The main objective of the environment audit is to promote the Environment Management and Conservation in the University Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

- To inculcate awareness among the students to real concerns of environment and its sustainability.
- To promote the concept of environmental conservation so as to minimize the extent of exploitation of resource use inside the campus.
- To ensure that the development of the campus foster to the concept of environmental sustainability.
- To assess whether investments made in increasing awareness among students regarding judicious use of electricity, biodiversity conservation, plastic free campus and environment have helped the Institution
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requiring high cost.
- To bring out a status report on environmental compliance.

3. Methodology

In order to perform environment audit, the methodology included different tools such as physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarize the present status of environment management in the campus:

- Biodiversity conservation
- Water management
- Solid Waste management
- Green area management
- Rain water harvesting

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4. Environment Audit Assessment Team

S.No	Name	Designation
1.	Prof. (Dr.) Kuldip Dwivedi Chairman	Head, Department of Environmental Science (EVS)
2.	Dr Rwitabrata Mallick Member	Assitant Professor, Department of Environmental Science
3.	Dr Pankaj Mishra Member	Associate Professor, Amity School of Engineering & Technology (ASET)
4.	Mr. Umesh Kumar Sharma Secretary	Assistant Director Administration, AUMP

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5. Observations and Recommendations

The main findings of the audit show those, in general, all the institutions/departments and students are aware about the need for environmental protection at a general level. It was also observed that a number of best practices such as maintaining garden, planting trees in the campus, solid waste management, plastic free campus etc. are followed in the campus

5.1 Biodiversity Management:

This indicator addresses the extent of flora and fauna inside the campus and initiatives adopted by the University for maintenance and conservation. The different types of species of plants growing naturally and planted to provide sustainability to the man-made ecosystem.

A) Observations:

The university campus is lush green with plantations of ornamental plants, trees, shrubs and herbaceous species. It has has a well maintained gardens and lawns.

Regular plantation of different types of plants is undertaken on important occasions like "World Environment Day, Raising day with the participation of staff and students.

Compulsory ENVS paper of 100 marks in the University Syllabus for all the students of all streams to develop Environmental Awareness.

The lush green campus of the environment is attracting the migratory bird particularly during the winter seasons. Adequate arrangements have been made to provide water and feed to the birds.

A botanical garden with about 50 species of medicinal plants has been set and will be upgraded.

b) Recommendations:

- Proposal for expansion of the botanical garden with more diversity of plants with economic importance.
- Organizing more community events, seminars and conferences in order to create awareness among students and others for the need to conserve diversity and encourage plantation of multipurpose tree species and high carbon sequestration potential.

5.2 Water Management

This indicator addresses water consumption, water sources, and fixtures. A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

a) Observations

The University is presently dependent on Borewells which are presently 10 in numbers. The water is hard with average prevailing TDS 1800 .However, soft water plant with capacity of 30 KL of ION EXCHANGE is installed in the Campus to improve the quality of water.

In addition for drinking water 24 Nos of 50 litre capacity RO are fitted in the entire campus. They are regularly maintained under AMC. In addition to above application for water supply has been forwarded to Nagar Nigam, Gwalior for supply of water with overall cost for laying dedicated pipe lines amounting to Rs 67 lakh has been deposited by the University. The work is yet to be completed.

Water is used for drinking purpose, toilets and gardening. During the survey, no loss of water is observed, neither by any leakages, nor by overflow of water from overhead tanks. The data collected from all the departments is examined and verified. Water quality is enhanced by using soft water plant of ION exchange of capacity 30 KL and ROs of 50 liter in 24 Nos are installed in the Campus to provide potable water.

b) Recommendations

- Reuse and recycle of water system is necessary. Although the waste water from the RO water purifier is used for gardening purpose, the scope can be increased to large scale re-cycling of water.
- Ensure that all cleaning products used by university staff have a minimal detrimental impact on the environment, i.e. they are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.
- Gardens should be watered by using drip/sprinkler irrigation system to maximize water use efficiency.
- Rain-water harvesting system needs to be installed in the campus. This will not only provide an additional source of water for use, it will help in recharging of the bore wells as well.

5.3 Waste Management

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be processed through recycling, repair, and reuse. Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threats to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus.

a) Observations

The waste management is well organized in the University. . Two STPs have been installed with following capacity:-

(a) STP No -1 – 2.10 KL

(b) STP No--2 - 1.60 KL

These sewage Treatment Plant are being maintained by authorized agency/S Green Wastetech located at Gurgoan (HR) under AMC.

Waste generated from tree droppings and lawn management is a major solid waste generated in the campus. The waste is segregated at source by providing separate dustbins for Bio-degradable and Plastic waste. Single sided used papers are recommended for use for writing and printing in all departments.

Most of the official correspondence is through emails which has drastically reduced the use of papers.

Metal waste and wooden waste is stored and given to authorized scrap agents for further processing. The solid waste is collected by the municipal corporation and disposed by their methods.

b) Recommendations

- Make full use of all recycling facilities provided by City Municipality and private suppliers. Products such as glass, cans, white, coloured and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture needs to re-cycle.
- Important and confidential papers after their validity to be sent for pulping.
- Use reusable resources and containers and avoid unnecessary packaging where possible.

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5.4 Green Area Management

This includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programmes.

a) Observations

The University has maintained the existing and added to the land scape environment of the Campus. The layout of the land has not been disturbed and existing hill features have been used for layout of the entire Campus. This has made the campus layout beautiful and has been appreciated by all dignities and visitors visiting the campus. Campus is located in the vicinity of many trees (species) to maintain the bio-diversity. Various tree plantation programs are being organized at university campus and surrounding villages through NSS (National Service Scheme) unit, ECO Club etc. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation program includes various types of indigenous species of ornamental, medicinal and multipurpose tree species (MPTS).

The University has installed Solar Power Plant 307 K.watt capacity. So as to save energy. This likely to be enhanced further

b) Recommendations

- To review periodically the list of trees planted in the garden, allot numbers to the trees and keep records. Assign scientific names to the trees.
- Promote environmental awareness through scientific lectures, conferences, seminars, independent research projects, and community service.
- Create awareness of environmental sustainability and take actions to ensure environmental sustainability inside the campus.
- Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings.
- Celebrate every year 5th June as 'Environment Day' and plant trees on this day to make the campus more Green.

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5.5 Rain water harvesting in the campus

1. Amity University Madhya Pradesh was established in the year 2011 in 102 Acre of land. The requirement of water for the campus is being met by digging 10 Nos of Borewells as no water from Nagar Nigam is being supplied.

2. The borewells dug in the campus have not enough ground water to yield water continuously. Half numbers of the borewells dry up during continuous pumping. To recharge these existing borewells and to restrict the out-flow of rainwater Amity University arranged to construct 10 Nos of Water Harvesting Pits of capacity 30,000 ltrs at various location (Water Catchment Area) to conserve rainwater. These pits have been provided enough filter media to restrict the mud/silt during rains.

3. This has also been applauded by Hon'ble High Court Gwalior MP.
4. The above has brought sea change in saving of rainwater and has thus improved the water level, of our borewells which helps us in meeting our water requirement in peak summers.

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6. Conclusions

The environmental awareness initiatives undertaken by the university are substantial. The installation of solar panels as renewable/alternative source of energy and two units of STPs for waste management are noteworthy. Besides, environmental awareness programmes initiated by the administration/departments shows how the campus is going green. Few recommendations are added like more efficient waste management using eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus, thus fostering sustainable environment and community development.

As part of environment audit of campus, we carried out the environmental monitoring of campus including illumination and ventilation of the class room. It was observed that illumination and ventilation is adequate considering natural light and ICT facility are provided in all the Lecture Theatres and Class Room on need basis. In addition, WIFI is provided to the entire Campus including Hostels.

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7. 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)
- Energy Conservation Act 2010.
- The Water [Prevention & Control Of Pollution] Act – 1974 (Amended 1988)
- The Air [Prevention & Control Of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules – 1982
- 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

Annexure 1

Particulars of flora inside the campus

DETAILS OF TREE GROWN NATURALLY

Name of Plant	Neem	Dakhsni	Gulmohar	Peepal	Sheesham	Raimaza	Khair	Heesh	Babul Desi	Ber	Anar	Churail	Hingota	Ghot	Kareel	Shesho	Total
Location	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	
Foresty																	
Block-A to Pump House No-1	164	115	78	4	5	140	377	54	8	6	2	5					958
Main Gate To Block-B(Back side)	222	412	16	2	17	291	553	65	9	10	1	11	254				1863
Block-C to Pump House No-2	99	885	18		3	267	99	26	30	11			25	2	52		1517
Pump House No-2 to Security Post	27	124				91	162	32	4	4			17	9	3		473
STP No-1 Area	20	31			3	3			1	4							62
Security Post to New Hostel	120	188	11		3	402	471	535	5	5		5	58	198	6		2007
New Hostel to Partition Zali	320	284	60		9	87	1285	473	18	5		4	274	37	11	18	2885
Total	**972**	**2039**	**183**	**6**	**40**	**1281**	**2947**	**1185**	**75**	**45**	**3**	**25**	**628**	**246**	**72**	**18**	**9765**

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Annexure 2

AMITY UNIVERSITY MADHYA PRADESH, GWALIOR

DETAILS OF TREE PLANTED

Name of Plant	Amaltas	Gulmohar	Kushum	Boganbolia	Kanair	Neem	Sheesham	Kanji	Maulshree	Arjun	Champa	Cycus	Alustinia	Tikoma	Bottle Brush	Bargad	Peepal	Kadam	Kalendera	Dhak	Dalmoth	Uomar	Palm	Alustomia	Bustomiya	Ambla	Shahtoot	Total
Location	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
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Chiller Plant to Bk-C Jn Ahuja side	7			15	43	6	2	2		37	21		22	15				14	4									188
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AIS Gate to H1 Reception Fencing side					5	14				19								2										40
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Security Post 10 to Partition Zali				276		86	80																			442
By UGC Team																5										5
On 16 Jul 19 by Order of Ho'ble Governer at various locations																20										20
By Hon'ble Guest																1										1
Sep-19						25																				25
Total	**158**	**67**	**22**	**1478**	**727**	**603**	**193**	**44**	**14**	**176**	**521**	**64**	**48**	**113**	**1**	**2**	**37**	**17**	**49**	**89**	**12**	**1**	**28**	**27**	**99**	**1**	**1**	**45922**

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Annexure 3

Rain Water Harvesting Pit (RWH), at the campus

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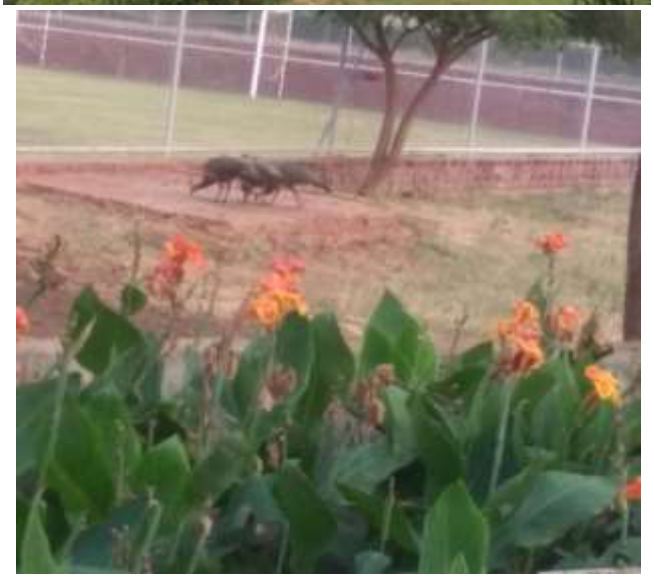
Annexure 4



Tree Plantation, Green Initiatives, Bird Feeding

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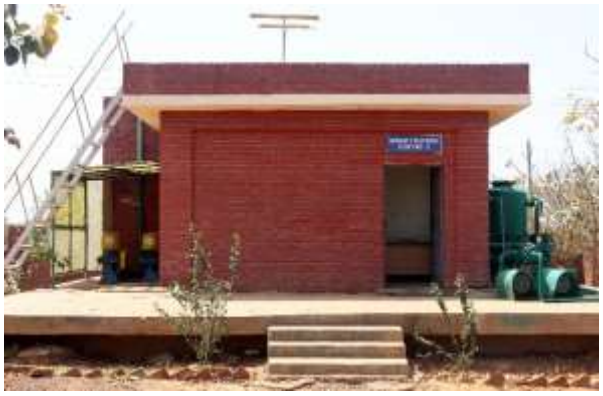
Annexure 6



Sewage Treatment Plant (STP), at the campus

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National Service Scheme (NSS): Detailed survey of the residents of the NSS adopted village Chakraipur".

(7th feb 2023)

National Service Scheme volunteers of Amity University Madhya Pradesh conducted detailed survey of the residents of the NSS adopted village Chakraipur in respect of the Name of Family Head; House: Own/Rented; Available source of water; House: PUKKA/Kachcha, No. of earning members; Financial Status; Caste; Religion; Bank account; Driving licence;, Ladli Lakshmi Yojana, Suknya Samraddhi Yojana; Blood.G; Education; samagra ID; Bank Acc.; Adhar Card; PAN card; Rashan Card; Gas connection; Driving License and Specific health issues". The program was conducted by 55 volunteers of NSS AUMP. The program was organized with the objective of enhancing the knowledge of the volunteers about the living conditions and social structures prevailing in the socially backward localities of Chakraipur village. The survey was inaugurated with the opening remarks of Program Officer, NSS, Dr. Rachana Kathal. Importance of awareness about living conditions in socially backward localities for a social volunteer to perform their social service duties was practically experienced by the NSS volnteers. The program positively met with the objective of inculcating the values of social concern, awareness, responsibility and connect with the felt needs of the society with the aim of preparing the NSS volunteers to be aware and ready for reaching out to them in the times of required help.

Program Officer, NSS Dr. Rachana Kathal and Dr. Sanjeev S Bhadoriya with NSS Volunteers in Chakraipur

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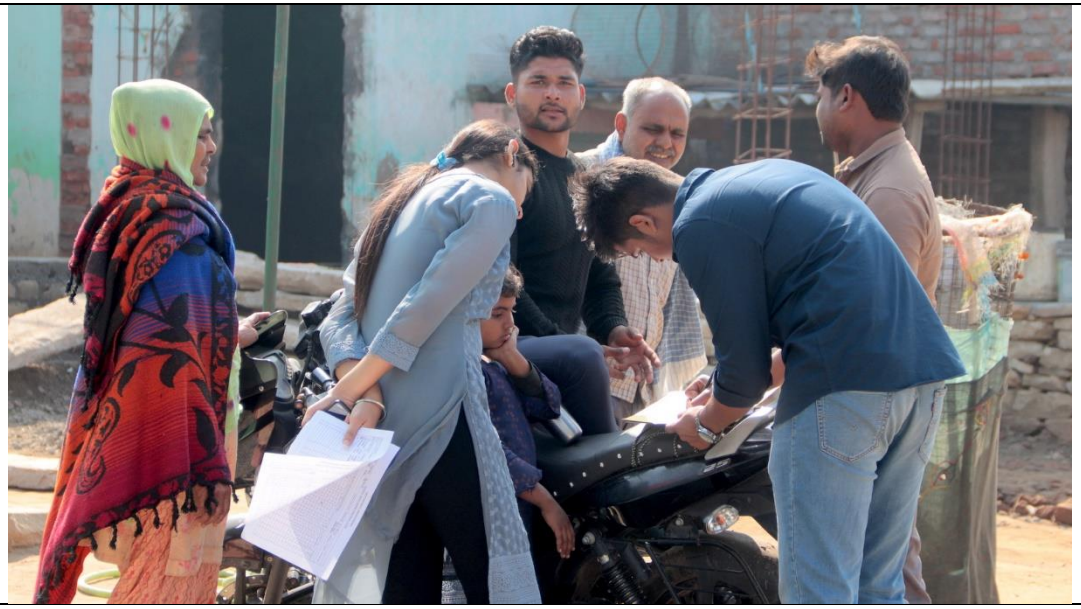

NSS Volunteers of AUMP conducting survey in Chakraipur

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AMITY UNIVERSITY
MADHYA PRADESH

ECO CLUB ACTIVITY REPORT

2022

Amity University Madhya Pradesh, Maharajpura Gwalior

(M.P.) – 474005, India

Tel No. 91- 751 - 2496021, Fax No. 91-751- 2496023

E-mail:info@gwa.amity.edu

Website: www.amity.edu/Gwalior

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Details of all the activities organized by Department of Environmental Science & Eco-Club, Amity University Madhya Pradesh, Gwalior for the year 2022

Eco-club Activities

Eco-club of Amity University Madhya Pradesh, Gwalior has been constituted for spreading awareness among students, for generating knowledge about the environment and towards making clean and green campus. Eco-club is continuously organising World Environment Day, tree plantation, educational tour, special lectures and awareness programmes every year.

- Department of Environmental Science and Eco-club members joint hand in organizing International Conference on Sustainability & Environmental Perseverance in the Era of COVID-19 (ICSEPC 2022) on 17 February 2022.

- Eco-Club AUMP, Centre of Excellence for Environmental Conservation and Biodiversity along with Department of Environmental Science, AUMP under Institution's Innovation Council, organised a "Poster Making Competition" on 11th May 2022 on "Environmental Awareness, Positive Acts and Sustainable Changes to Protect the Earth".

- Eco-Club AUMP, Centre of Excellence for Environmental Conservation and Biodiversity along with Department of Environmental Science, AUMP organised a "Poster Making Competition" on 5th June 2022 on the occasion of World Environment Day 2022.

- Eco-Club AUMP, Centre of Excellence for Environmental Conservation and Biodiversity along with Department of Environmental Science, AUMP organised a webinar on National Energy Conservation Day under the mandate of Institute Innovation Council an Initiative of MOE on 14th December 2022.

- Eco-Club AUMP, Centre of Excellence for Environmental Conservation and Biodiversity along with Department of Environmental Science, AUMP organised a hands on workshop on "Solid Waste Management" on 20th December 2022.

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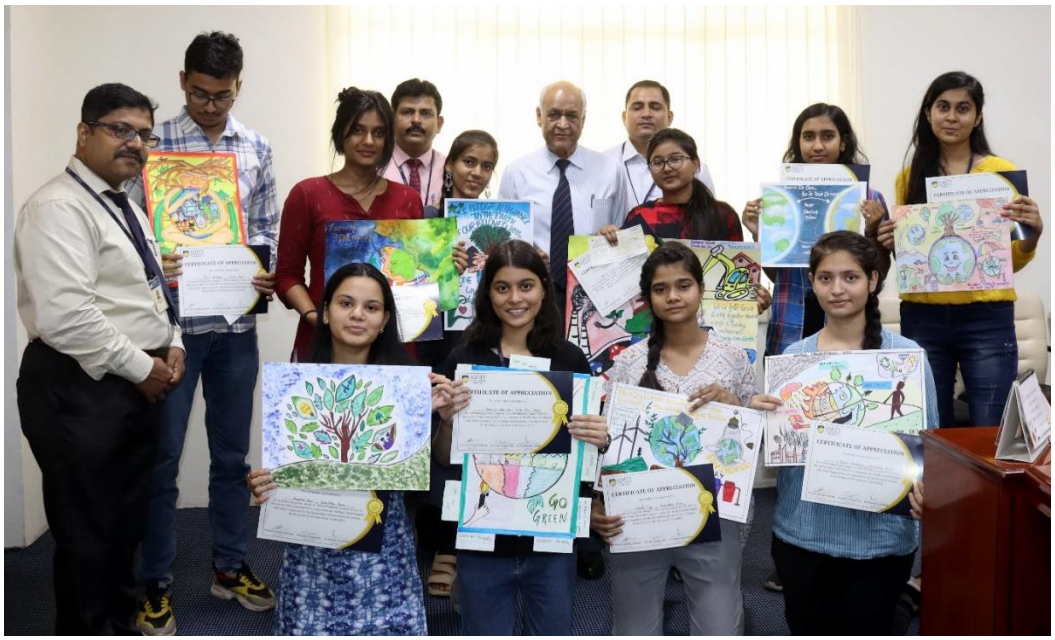
- 

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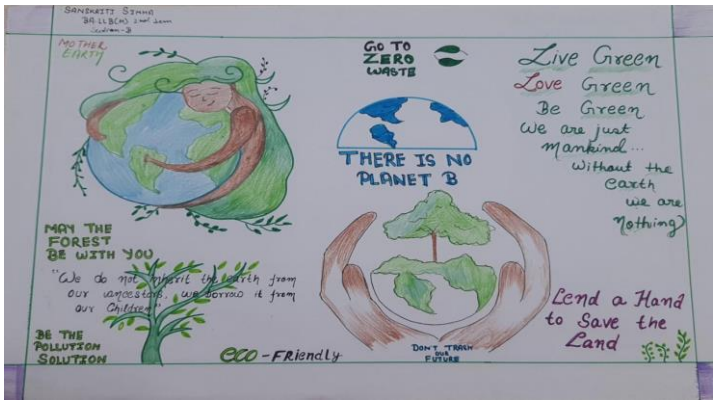

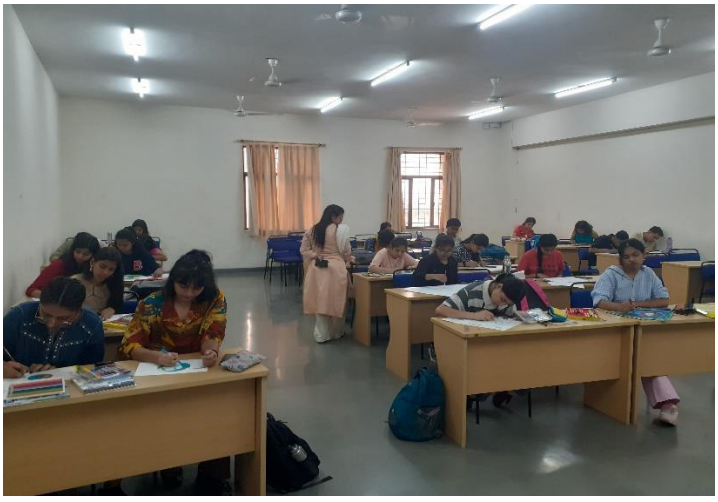

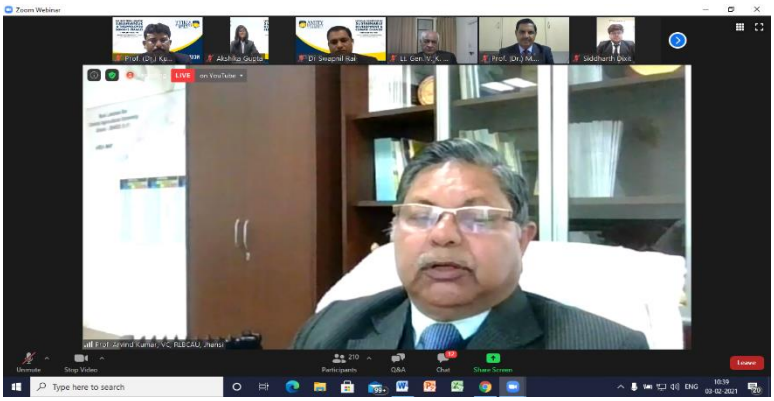

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AMITY UNIVERSITY MADHYA PRADESH, GWALIOR

DETAILS OF TREE GROWN NATURALLY

Name of Plant	Neem	Dakhsni	Gulmohar	Peepal	Sheesham	Raimaza	Khair	Heesh	Babul Desi	Ber	Anar	Churail	Hingota	Ghot	Kareel	Shesho	Total
Location	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Foresty																	
Block-A to Pump House No-1	164	115	78	4	5	140	377	54	8	6	2	5					958
Main Gate To Block-B(Back side)	222	412	16	2	17	291	553	65	9	10	1	11	254				1863
Block-C to Pump House No-2	99	885	18		3	267	99	26	30	11			25	2	52		1517
Pump House No-2 to Security Post	27	124				91	162	32	4	4			17	9	3		473
STP No-1 Area	20	31			3	3			1	4							62
Security Post to New Hostel	120	188	11		3	402	471	535	5	5		5	58	198	6		2007
New Hostel to Partition Zali	320	284	60		9	87	1285	473	18	5		4	274	37	11	18	2885
Total	**972**	**2039**	**183**	**6**	**40**	**1281**	**2947**	**1185**	**75**	**45**	**3**	**25**	**628**	**246**	**72**	**18**	**9765**

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AMITY UNIVERSITY MADHYA PRADESH, GWALIOR

DETAILS OF TREE PLANTED

Name of Plant	Amaltas	Gulmohar	Kushum	Boganbolia	Kanair	Neem	Sheesham	Kanji	Maulshree	Arjun	Champa	Cycus	Alustinia	Tikoma	Bottle Brush	Bargad	Peepal	Kadam	Kalendera	Dhak	Dalmoth	Oomar	Palm	Alustonia	Bustoniya	Ambla	Shahtoot	Total
Location	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
Main gate to Block-A Jn trench side	10	9	9	161	2	44	8	10	1																			254
Main gate to Block-A Jn bundry side	10	8	6	144	6	20	4	3																				201
Black-A to Hostel gate sport Gd side	45	1			70	26	6			23	82	32	2	6	1	1	3	1										299
Black-A to Hostel gate Boundry side	1			122	11	84	13			3	43		24	4			3											308
Behind Block-A		5		2	18	40			1											10	2							78
BK-B/C Jn to BK-A Turning Hill side				90	33	3	3		10	17	88			19					22			1						286
BK-B/C Jn to BK-A Turning BK-B side				55	60	10			1	6	47			28					12									219
Behind Block-B																							13					13
BK-C Front side		4		68	105	30	4					12		10					4				8					245
Behind BK-C		6				28	7																					41
Chiller Plant to Bk-C Jn Chiller side			3	33	63	10				7	19			2					4									141
Chiller Plant to Bk-C Jn Ahuja side	7			15	43	6	2	2		37	21		22	15				14	4									188
Generator side					38					8		1																47
Alustonia Park	3			30			3	1		2														14				53
Hostel JN to H1 Reception Hostel side	12	6		1	74	6	1	12	1		12			9						9					21			164
Hostel JN to H1 Reception STP side	14	4			10	21				3				7										12				71
AIS Gate to H1 Reception Fencing side					5	14				19								2										40
Hostel Plaza Area H1 side		2			19			2			104										2				27			156
Hostel Plaza Area H2 side					2						77														29			108
New Hostel H3 Area	1				9	11						19		2									7					49
H2 Hostel Park side	11	11		3	146			14			28			9					1	5	8			1	22			259
H2 Hostel Sport Complex side	8	10			9									2					2									31
Main Gate to Pump House No-2	36		4	123		17	5			51						1	1			8								246
STP-II to Pump House No-2		1		214	4	49	37										4			55						1	1	366
Pump No-2 to security Post 10				141		73	20													2								236
Security Post 10 to Partition Zali				276		86	80																					442
By UGC Team																	5											5
On 16 Jul 19 by Order of Ho'ble Governer at various locations																	20											20
By Hon'ble Guest (Ex Dubai)																	1											1
Sep-19						25																						25
Total	**158**	**67**	**22**	**1478**	**727**	**603**	**193**	**44**	**14**	**176**	**521**	**64**	**48**	**113**	**1**	**2**	**37**	**17**	**49**	**89**	**12**	**1**	**28**	**27**	**99**	**1**	**1**	**4592**

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Name of Plant	Amaltas	Gulmohar	Kushum	Boganbolia	Kanair	Neem	Sheesham	Kanji	Maulshree	Arjun	Champa	Cycus	Alustinia	Tikoma	Bottle Brush	Bargad	Peepal	Kadam	Kalendera	Dhak	Dalmoth	Oomar	Palm	Alustonia	Bustoniya	Ambla	Shahtoot	Total

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Waste Management

The university has segregated waste into three parts:

- Solid Waste
- Liquid Waste
- e-Waste

Solid Waste: The waste is generated by all sorts of routine activities carried out in the University that includes paper, plastics, glass, metals, foods, etc. The waste is segregated at each level and source. The administrative supervisor in each block ensures that the waste in each floor is collected at designated time intervals. The block cleaning workers in each floor collect, clean, segregate and compile the waste in the dustbins (Green and Blue) provided at each floor. The floor dustbins are emptied in movable containers/dustbins provided for each block and is taken to the dumping yard provided by the University.

The University has contacted an authorized vendor, who collects the waste from the designated place, segregates them, recycles them and disposes them at the landfills authorized by the government.

Liquid Waste: Liquid wastes generated by the university are of two types:

1. Sewage waste
2. Laboratory, Laundry and cafeteria effluent waste

The above waste is treated through Sewage Treatment Plants (STPs) and Effluent Treatment Plants (ETPs) and the water is used for horticulture and flushing in toilets.

e-Waste Management: Flip flops, memory chips, motherboard, compact discs, cartridges etc generated by electronic equipments such as Computers, Radio, TV, Phones, Printers, Fax and Photocopy machines are recycled properly. Instead of buying a new machine buyback option is taken for technology upgradation.

The e-waste generated from hardware which cannot be reused or recycled is being disposed off centrally through government authorized vendors.

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AMITY UNIVERSITY MADHYA PRADESH, GWALIOR

OTHER FACILITIES/STUDENT SUPPORTs

1 Shopping Complex to include ATM, Stationery Shop/Grocery and Amul Parlour.
2 Transport Facility available to the students. Approx 30% students are availing the facility.
3 08 Guest Houses 04 Each in Boys and Girls Hostel
4 Standby Power – 100%
5 Sufficient Parking available at each Block.
6 Landscaping and Greenery more than 70%
7 Plastic Free Campus.
8 Walking Pathways all along the Roads
9 Ramp/Rails/Handicap Toilets available in each Academic Block.
10 Gym and Recreation facilities available in each hostel.
11 Laundry Services available in the Campus.
12 Security- Sufficient Security staff and lightings available.
13 Entire Campus on LED lights.
14 Solar Plant of Capacity 307 KW installed in the Campus.
15 Well Organized Housekeeping Services. Participated in Swachhta Abhiyan under Agis of UGC.
16 Well Equipped Fire Fighting System in all Buildings.
17 Centrally Air-conditioned Campus.
18 Well Organized Water Harvesting System Ten in Nos available in the Campus, Appreciated by Hon'ble High Court, Gwalior.
19 Medical Facility with 24 Hours Ambulance/ Nursing Assistant available.

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AMITY UNIVERSITY MADHYA RADESH, GWALIOR

PHYSICAL FACILITIES

SL	DEPARTMENT	BLOCK	CLASS ROOM			LAB	FACULTY	DEPART LIB	COMP LAB	CAFETERIA	CENTRAL LIB	SEMINAR HALL	CONFERENCE HALL	AUDITORIUM	MOOT COURT	OFFICE	CENTRAL STORE	IT CELL	BOYS HOSTEL CAP 240	GIRLS HOSTEL CAP 240	MI ROOM	MESS	DINNING HALL	GEN ACTIVETY GROUND	VOLLEY BALL COURTS	SPORTS COMPLEX				SEWAGE TREATMENT PLANTCAP (2.1 +1.6) Lac LPD	CHILLER PLANT CAP 1200 TR	Tranformer 1500 KVA	Tranformer 250 KVA	DG SET 750 KVA	DG SET 250 KVA	Pump House	Water Bore wells	Dhobi Ghat	AREA OCCUPIED IN Sqm EXCLUDING Common Corridors, Toilets, Stairs
			PLAIN CR FULL	PLAIN CR HALF	LT																					BEDMINTON COURT	BASKET BALL COURTS	TENNIS COURTS	CRECKET PRACTISE PITCH									AREA in SQM
1	ASET	BK-A	11	10	4	7	4		3																													5182
2	ASET	BK-C	5			6	0.5																															1012
3	AIB	BK-B		5	3	4	1		1																													1012
4	ALS	BK-B	2		5		1																															704
5	ASCO	BK-B	1	3	2	1	1		1																													660
6	ASFDT	BK-B		4		2	0.5																															220
7	ASCENT	BK-B					0.5																															44
8	ABS	BK-C	6	10	10		1	1	1																													2200
9	AIP	BK-C	1		1	11	1	1																														1408
10	AIBAS	BK-C	1		1	1	0.5																															352
11	ASAP	BK-C			6	12	0.5	1	1																													1848
12	ASL	BK-C				1	0.5																															176
13	COMMON	BK-A								1	1	1	1			2		1																					790
14	COMMON	BK-B								1	1		1	1	1	8	1	1																					2679
15	COMMON	BK-C								1		1				1		1																					630
16	COMMON																		2	1	2	1	1	1	2	6	2	2	1	2	1	2	1	4	1	2	10	1	16550
	TOTAL		**27**	**32**	**32**	**45**	**12**	**3**	**7**	**3**	**2**	**2**	**2**	**1**	**1**	**11**	**1**	**3**	**2**	**1**	**2**	**1**	**1**	**1**	**2**	**6**	**2**	**2**	**1**	**2**	**1**	**2**	**1**	**4**	**1**	**2**	**10**	**1**	

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RAIN WATER HARVESTING IN THE CAMPUS

1 Amity University Madhya Pradesh was established in the year 2011 in 102 Acre of land. The requirement of water for the campus is being met by digging 10 Nos of Borewells as no water from Nagar Nigam is being supplied.

2 The borewells dug in the campus have not enough ground water to yield water continuously. Half numbers of the borewells dry up during continuous pumping. To recharge these existing borewells and to restrict the out-flow of rainwater Amity University arranged to construct 10 Nos of Water Harvesting Pits of capacity 30,000 ltrs at various location (Water Catchment Area) to conserve rainwater. These pits have been provided enough filter media to restrict the mud/silt during rains.

3 This has also been applauded by Hon'ble High Court Gwalior MP. Local Newspaper cuttings are attached for ref.

4 The above has brought sea change in saving of rainwater and has thus improved the water level, of our borewells which helps us in meeting our water requirement in peak summers.

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