



हरकोर्ट बटलर प्राविधिक विश्वविद्यालय

नवाबगंज, कानपुर - 208002, उ.प्र., भारत

HARCOURT BUTLER TECHNICAL UNIVERSITY

NAWABGANJ, KANPUR - 208002, U.P., INDIA

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100 YEARS
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(Prof. S.K. Sharma)
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Environment and Energy Policy



Harcourt Butler Technical University, Kanpur
Kanpur



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1. Summary

This document outlines the university's environment and energy policy. HBTU is committed to conservation of environment in a sustainable manner and reducing the carbon footprint in its campus. This policy outlines the university's objectives and targets for environmental conservation and pollution reduction, energy efficiency and the use of renewable energy and outlines the steps, the university is taking to meet these goals.

2. Policy Statement

The university is committed to managing energy and the environment in both, the east and west campuses of the university in an eco-friendly, cost-effective and timely manner. The university shall comply with the guidelines prescribed by the state of Uttar Pradesh (UP), Kanpur Nagar Nigam (KNN), UP State pollution control board and the ministry of energy issued from time to time.

3. Scope

This policy applies to all facilities, operations, and activities, including teaching, research, administration, residences, hostel inmates, and other student activities in the university. All university employees, students, contractual workers, and visitors are expected to comply with this policy.

4. Introduction

The goal of this policy is to demonstrate the university's commitment to implementing and delivering the best environment (air, water and land) and energy conservation and management strategies, as well as to ensure that energy and environmental aspects within the university are managed effectively and in conformance with the statutory guidelines prescribed by the regulatory bodies. The policy emphasizes the significance of taking into account the impacts on the environment and energy while making any decisions on the procurements and construction or renovation of facilities, which leads to degradation of the environment (air, water and land) or larger consumption of energy resources (in terms of fuels, power etc). The policy's main goals are to maintain livable and clean environment in a sustainable manner and improving the energy efficiency by reducing the adverse effect of energy usage in the HBTU East and West campuses.

5. Policy targets

Specifically, the university targets that by the year 2025,

- a) the University shall safely treat and dispose off all the solid and liquid waste generated in both campuses of the university.
- b) shall stop the use of plastics on the campus and substitute by biodegradable materials,
- c) ban on the use/sale of plastic bottled water on campus
- d) recovery of useful components/products from e-waste generated in the university and ensure proper disposal of e-waste.
- e) treat the household/institutional wastewater produced in a small capacity wastewater plant before discharging into the public sewers, using the treated effluent for horticulture and effective electronic waste management
- f) deploy solar panels as a source of clean and alternative source of energy for all hostels and office buildings

- g) implement biogas generation
- h) adopt electric vehicle transportation between the two campuses of the university.

6. Roles and Responsibilities

For effective implementation of the university's "Environment and Energy Policy", the roles and responsibilities of various stakeholders shall be as under:

a) *Nodal officer, Environment and Energy Policy*

A nominee of the Vice-Chancellor or the Pro-Vice Chancellor shall be the Nodal Officer. He/she shall have the overall responsibility to ensure the compliance of the environment and energy policy. He/she shall have to coordinate all the related activities and ensure the installation, execution and operation of infrastructure and logistics support for environmental conservation/pollution remediation and enhancing the energy efficiency by adopting the use of non-renewable energy sources in various energy generation facilities in the university.

b) *Heads of Departments* shall be responsible for ensuring,

- i) Collection and segregation of papers, plastic, card boards, laboratory waste, hazardous waste in their respective departments.
- ii) Segregation, safe storage and disposal of hazardous waste in accordance with relevant legislation in their respective department.
- iii) Identification of competent/trained personal to implement the arrangements for management of hazardous waste.
- iv) All wastewater infrastructure (toilets, urinals, sinks in laboratories etc) and other related appurtenances in their respective departments are in working condition so as to ensure smooth flow of sewage/wastewater to the sewers.
- v) Lights, fans, and air conditioners and lab instruments in conference rooms, labs, offices are switched off when they are not in use.
- vi) Procurement of laboratory equipment and devices that have good energy star ratings.
- vii) Ensuring efficient functioning of the environmental and energy conservation devices installed in the department and reporting deficiency, if any to the Nodal officer.

c) *Class Representative and Students of the class*

The Class Representative shall be responsible for ensuring the cleanliness of the class rooms, laboratories, corridors, amenities and hostels and advise all students not to through papers, litter, plastic and other waste. He/she shall also be responsible for switching off fans, lights and ACs in the classrooms and labs after the classes are over. In case of any issue related to housekeeping or faults in lights or fans or lab equipment, they shall report immediately to their respective Heads of the department or directly to the concerned staff in the department.

d) *Students*

All students of the university shall ensure cleanliness of their respective classrooms, laboratories, streets, corridors, amenities and hostels in the campuses. They shall also be responsible for switching off fans and lights in

classrooms and labs after the classes are over. In case of any issue related to housekeeping or faults in lights or fans or lab equipment, they shall report immediately to the Class Representative or the Warden or directly to the concerned staff in the department/hostel.

e) Dean of Student Welfare (DSW)

The DSW shall ensure and coordinate the cleanliness of all the hostels and compliance of this policy through the respective hostel wardens.

f) Hostel Wardens

- i) The wardens shall ensure the cleanliness of all the hostels and compliance of this policy.
- ii) They shall ensure that all treatment/disposal arrangements installed in their respective hostels are operational all the time.
- iii) They shall ensure that all the wastewater infrastructure (toilets, urinals, sinks in laboratories etc) and appurtenances in their respective hostels are in working condition so as to ensure smooth flow of sewage/wastewater to the sewers.
- iv) They shall ensure and encourage the use of energy-efficient compact fluorescent lamps (CFLs) and light-emitting diode (LED) bulbs in their respective hostels.
- v) They shall ensure solar water heating system in their respective hostels is operational and used for hostel bathrooms and other purposes.
- vi) They shall ensure fans and lights are switched off when not in use.

g) Professor In charge, Civil Maintenance

He/she shall be responsible for arranging and implementing all possible infrastructure and logistics needed for ensuring full compliance of the policy. This infrastructure/includes procurement/purchase of bins, brooms, wipers/moppers, phenyl/disinfectant, vehicle/trolley to transport the waste (in both campuses), workers, compost plant, solar panels, landfill, safety of workers and liaisoning with the vendors/contractors/Kanpur Nagar Nigam etc. He/she shall also be responsible for arranging O&M/AMC of all waste collection/transport and disposal infrastructure and the transport of waste to the biogas generation plant.

h) Head, Mechanical Engineering

He/she shall ensure the arrangements for installing the waste to energy plant- in form of biogas/compost plant, incinerator, boilers etc including the requisite designs of the same in accordance with the environmental and energy legislations.

i) Head, Electrical Engineering

He/she shall ensure installation and operation of solar panels in the university premises. He/she shall also ensure that the energy audit is conducted at regular interval.

j) Head, Computer Science and Engineering

He/she shall ensure identification, collection, segregation, reuse and safe disposal of e-waste generated in the university.

k) Head, Civil Engineering

He/she shall ensure the coordination of safe disposal of wastewater, solid waste (including plastics, paper, card board etc) generated in the university including the requisite designs in line with the environmental legislation.

l) Head, Chemical Engineering Department

He/she shall ensure the coordination of the safe disposal of hazardous waste generated in the university in line with environmental legislation. He/she shall also assist the Head, Mechanical Engineering in ensuring that the arrangements for installing the waste to energy plant- in form of a biogas/compost plant, incinerator, boilers etc including the requisite designs of the same in accordance with the environmental and energy legislations are in place.

Lastly, all the university employees, students, contractors, and visitors are responsible for following this policy for promoting a sustainable and environmentally responsible culture. The university management shall be responsible for ensuring the policy is effectively implemented and regularly reviewed.

7. Operational methodology

7.1 Environmental aspects

These aspects can be covered for solid waste, liquid waste and air pollution. These are discussed herein.

a) Solid waste

This can be categorized into collection, segregation, transport, and disposal.

Primary Collection

The university shall,

- a) ensure source segregation of waste, to channelize the waste to wealth by recovery, reuse and recycle. This shall be done at the level of each academic department, laboratories, hostels, administrative block, main building, canteen, hostel mess etc.
- b) ensure three coloured bin system (for Green Waste, Dry Waste, Hazardous Waste).
- c) make arrangement for door-to-door collection of segregated solid waste from all households including hostels and academic area.
- d) establish a system to identify organisations of waste pickers or informal waste collectors to facilitate their participation in solid waste management.

Secondary Collection

In this, the university shall,

- a) ensure three bins at every Secondary Collection Point.
- b) setup secondary storage facilities in east and west campuses of the university, with sufficient space for sorting of recyclable materials to enable informal or authorised waste pickers and waste collectors to separate recyclables from the waste.

- c) provide easy access to waste pickers and recyclers for collection of segregated recyclable waste such as paper, plastic, metal, glass, and textile from the source of generation or from material recovery facilities.

Transportation of Waste

In this, the university shall,

- a) transport segregated bio-degradable waste to the processing facilities like compost plant, bio-methanation plant or any such facility.
- b) make arrangement for in-house and on-site processing of such waste.
- c) transport non-bio-degradable waste to the respective processing facility or material recovery facilities or secondary storage facility;
- d) ensure transport of waste in segregated form in covered vehicles.

b) Liquid waste /wastewater

Collection, transport and treatment of Wastewater and safe disposal of treated effluent

In this, the university shall,

- a) facilitate the construction, operation and maintenance of requisite infrastructure for collection, transport of wastewater,
- b) ensure safe disposal of treated sludge.
- c) ensure safe disposal of treated effluent or re-use the same for gardening and horticulture purpose within the university.

c) Air pollution

For this the university has the following mechanism/measures in place:

- i) Majority of the unpaved footpaths along the roads in the academic campus i.e. east campus have been paved so as to reduce the particulate matter.
- ii) All the laboratories have exhaust fans so that the ambient air is free from harmful gases.
- iii) Appropriate openings in form of doors, windows and ventilators have been provided.

Specific tasks are undertaken on an immediate basis.

The university shall implement the following on immediate basis:

- Proper collection and Segregation of domestic and institutional waste
- Timely transportation.
- Daily Road sweeping-of roads, class room, departments and hostels.
- 100% collection at fixed time 365 days in a year
- Penalize the polluters/defaulters through a monetary fine.
- Ban the sale and use of plastic carry bags (of thickness less than 50 microns) within the university premises.
- Encourage students to develop eco-friendly products in the project work.
- Organize effective “Information, Education and Communication (IEC)” and “Capacity Building” programmes.

7.2 Energy aspects

The specific mechanism/practices and steps for energy conservation in the university are identified as:

- Switching to energy-efficient light systems: Switch to energy-efficient lighting systems such as LED lights, which can reduce energy consumption and costs.
- Installation of energy-efficient equipment in laboratories, hostels and offices of the university. : This includes replacing older equipment with more energy-efficient alternatives and making sure that new equipment meets energy-efficiency standards.
- Implement energy-saving behavior: Encourage staff, students, and other members of the university community to adopt energy-saving behavior, such as turning off lights and equipment when not in use.
- The university has a plan to implement a building management system that will help to control and monitor energy consumption in real-time and can be used to identify areas where energy consumption can be reduced.
- The university is in the process of installation of solar energy systems: Installing renewable energy systems such as solar panels can help to reduce the university's dependence on fossil fuels and contribute to a cleaner energy future.
- Increase insulation and air sealing: Increasing insulation and air sealing can help to reduce heating and cooling costs, and can make buildings more comfortable for occupants.
- The university has adopted conservation measures in the context of energy-water systems. For example, conservation measures such as low-flow showerheads and toilets can help to reduce water consumption and costs and save associated energy requirements.
- The university encourages a sustainable transport system. Recently it has adopted a energy-saving e -rickshaw and nonmotorized transport in form of bicycles. It encourages alternative transportation such as cycling, walking, or taking public transit can help to reduce the university's carbon footprint.
- It monitors energy consumption: Regular monitoring of energy consumption can help to identify areas where energy consumption can be reduced, and can be used to evaluate the effectiveness of the energy-saving measures.
- Continuously review and update energy-saving measures: Energy-saving measures should be reviewed and updated on an ongoing basis to reflect changes in technology and energy consumption patterns, and to ensure that they continue to be effective.

The university lays specific emphasis on clean energy systems and energy conservation methods on the university campus.

Solar energy

The university aims to incorporate solar energy in various facilities:

- Solar photovoltaic (PV) systems: Solar PV systems convert sunlight into electricity, which can be used to power buildings, lighting, and equipment in the university.
- Solar water heating systems: Solar water heating systems use the sun's energy to heat water, which can be used for a range of purposes including showers, laundry, and cleaning.

- Solar-powered outdoor lighting: Solar-powered outdoor lighting can provide light in outdoor areas without relying on grid-connected electricity, reducing energy costs and contributing to a cleaner energy future.
- Solar-powered educational resources: Solar energy can be used as an educational resource, with universities incorporating solar energy into curricula, research, and student projects.
- By incorporating solar energy into their energy mix, the university can reduce energy costs, contribute to a cleaner energy future, and provide valuable educational opportunities for students. Additionally, the use of solar energy shall establish university's reputation as a leader in sustainability and contribute to a positive public perception of the institution.



Figure: Solar panels for water heating in hostels

Implementation

In view of identified measures, the university shall

- Strive to reduce energy consumption through the implementation of energy-efficient practices and technologies.
- Actively promote the use of energy-saving devices, such as CFL and LED lights, and practices such as turning off lights, fans, air conditioners, computers, and other equipment when not in use.
- Encourage use of solar energy-based heating devices and biogas.
- Encourage the use of eco-friendly public transportation such as E-rickshaws for commuting between campuses, and alternative modes of transportation, such as cycling.
- Regularly review and update its energy consumption data and targets to ensure continuous improvement.

Specific tasks be undertaken on immediate basis.

The university shall implement the following on an immediate basis:

- Monitoring the energy usage
- Switching off electrical equipment, fans, and lights after classes
- Periodic maintenance of air conditioners
- E-rickshaws for commuting between campuses
- Availability of bicycles for students

- Penalize the defaulters through a monetary fine
- Encourage students to develop alternate energy-based and environmentally friendly devices

8. Capacity Building and Training through IEC (Information, Education and Communication)

The success of any “Environment and Energy Policy” depends upon the extent of public/community participation. Thus, the university shall undertake capacity building by training students, housewives and other staff of the university. It shall also organize Information, Education and Communication (IEC) activities. The main objectives of IEC shall be to make people understand and become aware of energy and environmental concerns. Specifically, these include,

- Realize the concept and need for segregation of solid waste at the source
- Understand the need to waste storage at the source in separate receptacles - one for biodegradable and another for recyclable.
- Encourage citizens in the primary collection of waste from the household and handing over to waste collectors,
- Promote the need to use litter bins on roadsides and public places.
- Increase awareness of the impact of waste on public health and the environment
- Increase public understanding of the benefits of energy conservation, including reduced energy costs and a reduction in greenhouse gas emissions.
- Encourage the use of energy-efficient technologies, such as LED lighting and Energy Star-rated appliances.
- Educate the public on simple energy-saving habits
- Encourage individuals, businesses, and organizations to adopt energy-saving practices and make energy conservation a part of their daily routine.
- Raise awareness of the environmental and economic impacts of energy production and consumption, and the importance of transitioning to renewable energy sources.
- Provide information on government and private sector programs and incentives for energy-saving measures and the installation of renewable energy systems.
- Promote community-wide efforts to reduce energy consumption and increase the use of clean, renewable energy.
- Engage student community in energy conservation efforts, to foster a culture of sustainability and encourage environmentally responsible behaviour.

To this end,


- The university shall promote environmental and energy usage awareness through education and training programs for employees, students, and visitors.
- The university shall actively participate in environmental and energy conservation initiatives and encourage its community to do the same.
- The university shall conduct energy and green audits in periodic manner.
- The university shall regularly review and update its environmental and energy policies and procedures to ensure continuous improvement.

9. Implementation Committee

For effective implementation of the “Environment and Energy Policy”, there shall be an Environment and Energy Policy Implementation Committee. The committee shall review the policy and update it annually or as necessary to ensure its continued relevance and effectiveness in promoting sustainability and reducing the environmental impact of the university.

The constitution of the same shall be as follows:

- a) Nodal Officer, Environment and Energy Policy
- b) All Heads of Departments
- c) Dean (Student Welfare)
- d) All Hostel wardens
- e) Professor In charge, Civil Maintenance
- f) Dean of all Schools of the university



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Events organised by NSS HBTU during Session 2017-18

CLEANING ACTIVITY IN SLUM AREAS

"Swachhta Ki Pathshala"

The NSS Unit of HBTU College organized a four days Cleanliness Drive under the Swachh Bharat Mission in the year 2017. The main purpose of this program was to address the issues of personal hygiene, public sanitation conditions, lack of awareness and the general issue of public attitude that withholds the population in taking a proactive attitude towards the problem i.e. the cleanliness.

The campaign focused on gathering as much attention as possible towards this issue as it is not taken seriously. The members of NSS unit visited a local slum- a camp of migrant workers where they explained the importance of cleanliness and underwent the motions of sweeping and garbage disposal along with the locals. The event of this mass awareness campaign involved a group of 26 volunteers who carried out an awareness rally.

Ingrained with the pure spirit of the Swachh Bharat, they vowed to keep up the efforts of clean environment on a personal level even after the Drive was over.





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DONATING CLOTHES TO THE NEEDY

"It's better to donate than accumulate"

National Service Scheme (NSS) members at HBTU- KANPUR have collected over Kgs of old and unused clothes for donation in the year of 2017-2018. Students appreciate the chance to prevent wastage. Our preferences keep changing so we have many unused clothes. "This is a great solution" said by our seniors.

The drive took place in three parts. *First part* includes cloth collection from hostel. NSS volunteers placed cardboard collection bins in common areas where students could leave their unused clothes.

Second part covered volunteers approaching the quarters of professors and non-teaching staff for old clothes.

The last part includes graduating seniors who can donate clothes, mattresses, bedding and possessions as they no longer need them.

In this way we have completed our CLOTH DONATION DRIVE very effectively and efficiently with the active participation by all the 26 NSS team members.





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100 YEARS
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CLEANLINESS DRIVE

Mahatma Gandhi, the father of our nation gave the mantra “Cleanliness is Godliness” as he had a dream to make a clean country.

Clean India or Swacchh Bharat Abhiyan is a national level campaign with an aim of cleansing India of unwanted filth from the society. As a part of our contribution to the government’s initiative to clean India, the team members of NSS HBTU participated in the drive near ZOO area, municipal parks and Green Belt area in which about 35-40 students of the HBTU's NSS team gathered. They were fully geared up to demonstrate the community to lead their practices in waste recycle management production of usable products by recycling and innovative use of scrap material.

They campaigned its necessity as a small step towards creating a ‘Swachh Bharat’. The students also demonstrated production of reusable masks to be used in the current scenario. The students and professors were very enthusiastic and they were very receptive and participated very well.





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Events organised by NSS HBTU during Session 2018-19

EDUCATE POOR CHILDREN

In an increasing population like ours with more than a billion people progressing towards growth, the world might forget the rights of the underprivileged children but we never. NSS HBTU, with exemplary moral values as the core of its foundation, took the initiative of teaching poor children in slums and other backward areas. Keeping the noble view of "Education for all", team **SAAKSHAR** under this initiative, taught the students with complete commitment, leading the students towards new horizons and opportunities. The volunteers of the team provided the students with notebooks, bags, pens, pencils and all the other necessities.

These students were very keen on learning things, they had hopes in their eyes and NSS HBTU has always been adamant on fulfilling those hopes. Team SAAKSHAR, ignited a learning spirit among these students and NSS HBTU will keep giving to others on a greater level.

There were 25 to 28 students participated in this great initiative.





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NUKKAD NATAK

Patriotism is the thread connecting all the souls of our great Nation and while not everyone showcases it but we all respect it. We are a country rich in culture and traditions and among those various traditional media, is Nukkad Natak, where the performers take it to the street and stun everyone with their act. On 26th January, NSS HBTU organised Nukkad Natak at

the public place, Nawabganj on Patriotism. The students of HBTU gave an enthusiastic performance, instilling patriotism in everyone present and people started enchanting "Jai Hind" by the end. There Were 25 to 30 students participated in it. As Jawaharlal Nehru said, "Citizenship consists in the service of the country", NSS HBTU emphasized on this thought with the help of Nukkad Natak, leading to its huge success.





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COW PROTECTION DRIVE

The students of HBTU have the opinion that cows should be protected from slaughter and any form of violence at the hands of humans. The cow is considered as our mother. She provides us with milk and the least we can do in return is to protect her from harm. NSS HBTU, concerned with the rise of violence against cows, started Cow Protection Drive to address this heinous activity. Students of HBTU took to the streets and fed the cows and made people aware of their importance. Students of HBTU went to a cow shelter and provided authorities with the resources to take care of them. There were 35 students participated in it. The cow protection drive was followed by a peace rally by the students of HBTU.





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GLOBAL DIABETES WALK

Diabetes has always been a major concern not only in India but in the world with the fact that it doubles a person's risk of early death. NSS HBTU, understood that the need to raise awareness among the general public about the metabolic disorder and educate them on the blood sugar levels are at an all time high. With this thought in mind, NSS HBTU conducted a seminar in Diabetes to help people understand the risks, causes and symptoms of diabetes and how to prevent it. The seminar was very engaging and even helped people to access medical facilities in case such a situation arises. Following the seminar, NSS HBTU also organized Global Diabetes Walk, to motivate people and especially youths to understand the risk of diabetes and to prevent it while they can. Banners and other resources were distributed and put on different places for a greater impact.



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Events organised by NSS HBTU during Session 2019-20

EDUCATE POOR CHILDREN

Our program “SAAKSHAR” continued from the very beginning, this year even the new students of the college, that in the first year even participated. Volunteers continued their effort and taught the students with their full dedication. There were 26 students participated in it. These kinds of programs help in channelizing the energy of students towards a positive direction. It helps them and society simultaneously.




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CLEANING ACTIVITY IN SLUM AREAS

In this event, volunteers went outside the campus to the nearby slums and localities where they had performed the cleaning activity and tried to explain the importance of cleanliness and hygiene. They tried to bring their focus towards the problems which arise due to the lack of a healthy atmosphere. Volunteers explained to them the importance of cleaning drinking water and use of soap before and after using the washroom. There were 25 to 28 students participated in it.





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100 YEARS
1921 - 2021

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NUKKAD NATAK

Nukkad Natak has always been an important part of NSS and this year again NSS prepared a street theatre. On 26th January 2019 on the occasion of Republic Day, students presented a beautiful street theatre dedicated to the life of a soldier on the border. With this street theatre, our main objective was to display the problems faced by the soldiers who are protecting our lives in extreme conditions away from their families ready to die for the protection of their motherland.




(Prof. S.K. Sharma)
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EDUCATE POOR CHILDREN

Like every year we restarted our “SAAKSHAR” program and recruited first-year students as new teachers and rebuilt the program with more students. First-year students have shown great enthusiasm towards our program and joined with great zeal. This program was a great utilization of the time of the first year which they usually spent in roaming around. It gave them a positive direction and made them more conscious of the responsibility which they have since now they are in college.




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Events organised by NSS HBTU during session 2020-21

SETTING OF JANTA RASOI

We have started this campaign to deliver food to needy people who can't afford at least a single meal in a day. We prepared some food and delivered these to the various areas of Kanpur. It was successfully executed by our team.



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PLANTATION DRIVE

In this event, we performed a plantation drive all over the HBTU east campus as well as in some locations of Kanpur. In this event, first-year students participated with very great enthusiasm as well as faculty even can't resist themselves to become part of this drive.





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CORONAVIRUS AWARENESS

A seminar on Novel Coronavirus Awareness was organized on MAY 22 2021 in the Radha Krishnan auditorium in HBTU KANPUR.

The university premises were richly decorated with small festoons and banners. At 11 a.m., all the teachers, and students were present there. The program started with the arrival of Honorable Chief Guest V.C SIR, DEAN OF ACADEMIC AFFAIRS Mr. Sunil Kumar Sir and NSS Convenor Mr. Prathvi Pati sir. An eminent doctor P. Banerjee presented on the stage. The students welcomed all the guests with bouquets. Then the two eminent physicians delivered their highly valuable speeches on this pandemic. They shared their knowledge about the coronavirus, safety measures to prevent the virus, symptoms of Covid-19, and how the virus is spreading among people. They also clearly explained the ways to improve the immunity of our body and food habits. Then, Sunil Kumar sir presented an image like description about how coronavirus was reported on December 31, 2019 in Wuhan, China. Then, on March 11 WHO declared Covid-19 as a pandemic. A student of 1st B. Tech. CE, Soniya Choudhary recited a self-written poem about the Covid-19 pandemic. Then, two students presented a drama on how awareness is important for the students to defeat Covid-19. To make the programme more glorious, masks and sanitizers were distributed among the students on behalf of the medical department. At the end of the program, NSS Convenor Mr. Prathvi Pati sir delivered a short speech to the students and gave a vote of thanks to all for making the program a grand success. The students left for home storing some good memories about coronavirus awareness in the layer of their minds.





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Events organised by NSS HBTU during session 2021-22

EDUCATE POOR CHILDREN

Team NSS HBTU, KANPUR organised a program on Educate poor children on 2 June, 2022. The main objective of this programme was to create awareness about education for poor children.

Team 'Saakshar' began with teaching children of the non-teaching staff of the college. This project aims to enable the holistic development of underprivileged students by imparting quality education free of cost. The volunteers of NSS HBTU teach the students so that they prove to be an asset for their families and the country at large.

So, these were some of the important points covered in that session. At the end of the session NSS Convenor gave a speech.





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SAVE THE ENVIRONMENT

On Sunday 5th June 2021, Team NSS HBTU organized an awareness programme on the save our environment. All the students and faculty members participated with full energy in this programme. Honorable V.C. Sir and NSS Convenor Mr. Prathvi Pati Sir were also present at the program. The objective of this programme was to spread awareness among people about saving our environment from various types of pollution and to plant more and more trees to make our mother earth full of greenery.

Our program started with prayer at 8:30 am. All the students were given one sapling by the college Civil Department, which was to be planted all around the campus. After the start of the program, all the students started planting their saplings around the campus, as well as all the teachers also helped the students in planting. There were also some groups of students who were engaged in cleaning the college campus. The gardener of college was also making sure that all the students were doing the planting properly or not. After the plantation programme was over, all the students were sent to the Radha Krishnan auditorium.

In the auditorium NSS Convenor Mr. Prathvi Pati sir gave a very good and well-researched speech about how the condition of our environment today is and why we need to be aware. He also told us what steps we should take immediately so that we can make our environment healthy. In the end, he took a promise from all the students that no one will pollute the environment and will not allow anyone to do so.





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A FITNESS DRIVE

On 21 June 2021 with great eagerness and enthusiasm at HBTU KANPUR, Fatorda under the NSS-HBTU Unit and coordinated by NSS convenor Mr. Prathvi Pati sir and was attended by around 35 staff and 400 students.

He gave an enlightening talk on Stress Management. In his talk he stated that stress is due to external pressure and inability to cope with it. He educated the gathering on various ways to cope up with stress and its management and thus live a healthy life.

Before the demonstration, Dean of Academic Affairs Mr. Sunil Kumar sir explained the meaning of Yoga and then illustrated Pranayama and elaborated on its importance and benefits. Dr. Deepesh sir from Civil Department demonstrated the various Asanas and stressed on the need to practice them every single day. He elaborated the point that regular yoga practice leads to a better mental, physical and intellectual health. It positively changes the lifestyle of the people and increases the level of well-being.

Finally, the session was concluded by Prathvi Pati sir delivering the vote of thanks.





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A Panel Discussion of Doctors

Doctors are considered next to God. In this panel discussion we have acknowledged contribution and noble work by doctors. This day is commemorated to show gratitude towards all the doctors who work 24x7, day and night to ensure our good health and safety. For acknowledging the contribution of doctors National Doctors Day is celebrated. The National Doctors Day is being observed in India since 1991 in honour of Dr BC Roy - an eminent physician, freedom fighter and politician in West Bengal. He had played a significant role in forming the Indian Medical Association and Medical Council of India. In this panel discussion we emphasised the value of doctors who provide care for an entire family or a community.





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LETS CONNECT WITH PEOPLE

This event marks for the importance of friendship in life. It is the key for maintaining peace and harmony and generate passion for a better world where all are united.

The vision of this was to forge a strong bond of friendship of people of various countries irrespective of race, colour, gender, religion etc. Team NSS conducted a play instilling the idea that "Friendship has no religion. Caste and religion are meant to divide people. What unites the souls, is only love and friendship."

Our College with NSS members, celebrated this festival and friends exchanged gifts, cards, chocolates, flowers, the friendship bands with each other to celebrate their bond. Through the play NSS showed how real friends provide us emotional support, help us, guide us and support us. Therefore, we say can say that friends make life amazing and full of joy.





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MOTIVATIONAL TALKS FOR YOUTH

An event was organised by team NSS on 12 August 2021, in front of Radha Krishnan Auditorium. It was celebrated worldwide to amplify the message that action is needed across all generations to achieve the Sustainable Development goals and leave no one behind. We gathered a huge amount of people specially youth to make them aware about this and its importance.

The event started at 11:00 am sharp wherein we raised awareness on certain barriers to inter-generational solidarity, notably ageism, which impacts young and old people while having detrimental effects on society as a whole. We also educated them about life of Swami Vivekananda who was one of the greatest philosopher and spiritual leader. We conveyed his ideas on how the young should participate in the modern world while upholding their values. We knew that this could be a great source of inspiration. We made them aware about the power of youth and the change they can bring if pushed in the right direction. Lastly, we pledged to join hands across barriers and work as one to achieve more equitable, just and inclusive world for all the people. The event ended within 3 hours and it went well. The world needs power of youth to bring a change and each and every person should know that he/she can contribute a lot in countries' development by doing small things.





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SEMINAR ON PRIMARY EDUCATION

On 13 SEPTEMBER 2021, team NSS HBTU organized a webinar in the Radha Krishnan Auditorium to celebrate this day. The members of NSS delivered their speech describing the importance of this day.

Some of the highlights of that webinar are as follows:

Having education in an area helps people think, feel, and behave in a way that contributes to their success, and improves not only their personal satisfaction but also their community. In addition, education develops human personality, thoughts, dealing with others and prepares people for life experiences.

Finding a job is not easy, especially in times of economic turmoil. You often need to compete with hundreds of other candidates for a vacant position.

One of the benefits of education is that the education system teaches us how to obtain and develop critical and logical thinking and make independent decisions.

These were some of the important points covered in that session. At the end of the session NSS convener gave a speech.





VARUNAV SPARCK CONTROL PRIVATE LIMITED

Engineers, Power System Consultants, System Commissioning, Installation Improvement

Ref No. :

Date : 01.08.2021

ENERGY AUDIT OF GUEST HOUSE CAMPUS H.B.T.I. KANPUR

Sr No.	Place	Equipment's	Qty	Load (watt)	Total load (watt)	Recommended of Equipment's* Qty	Qty	Load (watt)
1	Room No. 1	Split AC 1.5 Ton	02	2980	3280	No change	2980	3059
		Fan (200 watt)	01	200		Fan (40 watt) *1	40	
		Tube Light (40 watt)	01	40		LED Tube Light (12 watt) *1	12	
		C.F.L (20 watt)	03	60		LED Bulb (09 watt) *3	27	
2	Room No. 2 V.I.P	Window AC 1.5 Ton	02	3220	3820	Sufficient of 1 No. split A.C. 1.5 Ton As per Volume *1	1490	1648
		Fan (200 watt)	02	400		Fan (40 watt) *2	80	
		Tube Light (40 watt)	02	80		LED Tube Light (12 watt) *2	24	
		C.F.L (20 watt)	06	120		LED Bulb (09 watt) *6	54	
3	Room No. 3 V.I.P	Window AC 1.5 Ton	02	3220	3820	Sufficient of 1 No. split A.C. 1.5 Ton As per Volume of *1	1490	1648
		Fan (200 watt)	02	400		Fan (40 watt) *2	80	
		Tube Light (40 watt)	02	80		LED Tube Light (12 watt) *2	24	
		C.F.L (20 watt)	06	120		LED Bulb (09 watt) *6	54	
4	Room No. 4	Split AC 1.5 Ton	01	1490	1790	No Change	1490	1569
		Fan (200 watt)	01	200		Fan (40 watt) *1	40	
		Tube Light (40 watt)	01	40		LED Tube Light (12 watt) *1	12	
		C.F.L (20 watt)	03	60		LED Bulb (09 watt) *3	27	
5	Room No. 5	Split AC 1.5 Ton	01	1490	1790	No Change	1490	1569
		Fan (200 watt)	01	200		Fan (40 watt) *1	40	
		Tube Light (40 watt)	01	40		LED Tube Light (12 watt) *1	12	
		C.F.L (20 watt)	03	60		LED Bulb (09 watt) *3	27	
6	Room No. 6	Split AC 1.5 Ton	01	1490	1790	No Change	1490	1569
		Fan (200 watt)	01	200		Fan (40 watt) *1	40	
		Tube Light (40 watt)	01	40		LED Tube Light (12 watt) *1	12	
		C.F.L (20 watt)	03	60		LED Bulb (09 watt) *3	27	



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7	Room No. 7	Split AC 1.5 Ton	01	1490	1790	No Change	1490	1569
		Fan (200 watt)	01	200		Fan (40 watt) *1	40	
		Tube Light (40 watt)	01	40		LED Tube Light (12 watt) *1	12	
		C.F.L (20 watt)	03	60		LED Bulb (09 watt) *3	27	
08	Room No. 8	Split AC 1.5 Ton	01	1490	1790	No Change	1490	1569
		Fan (200 watt)	01	200		Fan (40 watt) *1	40	
		Tube Light (40 watt)	01	40		LED Tube Light (12 watt) *1	12	
		C.F.L (20 watt)	03	60		LED Bulb (09 watt) *3	27	
09	Room No. 9	Split AC 1.5 Ton	01	1490	1790	No Change	1490	1569
		Fan (200 watt)	01	200		Fan (40 watt) *1	40	
		Tube Light (40 watt)	01	40		LED Tube Light (12 watt) *1	12	
		C.F.L (20 watt)	03	60		LED Bulb (09 watt) *3	27	
10	Room No. 10	Window AC 1.5 Ton	01	1610	1910	No Change	1610	1689
		Fan (200 watt)	01	200		Fan (40 watt) *1	40	
		Tube Light (40 watt)	01	40		LED Tube Light (12 watt) *1	12	
		C.F.L (20 watt)	03	60		LED Bulb (09 watt) *3	27	
11	Room No. 11	Split AC 1.5 Ton	01	1490	1790	No Change	1490	1569
		Fan (200 watt)	01	200		Fan (40 watt) *1	40	
		Tube Light (40 watt)	01	40		LED Tube Light (12 watt) *1	12	
		C.F.L (20 watt)	03	60		LED Bulb (09 watt) *3	27	
12	Room No. 12	Window AC 1.5 Ton	01	1610	1910	No Change	1610	1689
		Fan (200 watt)	01	200		Fan (40 watt) *1	40	
		Tube Light (40 watt)	01	40		LED Tube Light (12 watt) *1	12	
		C.F.L (20 watt)	03	60		LED Bulb (09 watt) *3	27	
13	Lounge	Split AC 1.5 Ton	02	2980	4060	Sufficient of 1 No. split A.C. 2.0 Ton As per Volume *1	1986	2236
		Fan (200 watt)	04	800		Fan (40 watt) *4	160	
		Tube Light (40 watt)	06	240		LED Tube Light (12 watt) *6	72	
		C.F.L (20 watt)	02	40		LED Bulb (09 watt) *2	18	
14	Dining Hall	Split AC 1.5 Ton	02	2980	3340	Sufficient of 1 No. split A.C. 1.5 Ton As per Volume *1	1490	1618
		Fan (100 watt)	02	200		Fan (40 watt) *2	80	
		Tube Light (40 watt)	04	160		LED Tube Light (12 watt) *4	48	



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15	Conference Hall	Split AC 1.5 Ton	02	2980	3860	No change	2980	3316
		Fan (100 watt)	06	600		Fan (40 watt) *6	240	
		Tube Light (40 watt)	06	240		LED Tube Light (12 watt) *6	72	
		C.F.L (20 watt)	02	40		LED Bulb (12 watt) *2	24	
16	Corridor (G.F.)	C.F.L (20 watt)	06	120	240	LED Bulb (12 watt) *6	72	144
	(F.F.)	C.F.L (20 watt)	06	120		LED Bulb (12 watt) *6	72	
17	Reception (G.F.)	Fan (100 watt)	02	200	400	Fan (40 watt) *2	80	160
	(F.F.)	Fan (200 watt)	02	200		Fan (40 watt) *2	80	
18	Roof Boundary	Sodium Light (500 watt)	04	2000	3860	No change	2000	2360
	Boundary & Gate	C.F.L (20 watt)	12	240		LED Bulb (15 watt) *12	180	
	Lawn	C.F.L (20 watt)	12	240		LED Bulb (15 watt) *12	180	
		In watt		41650	41650			30550
		In Kilo watt		41.65	41.65			30.55

Advice and Recommendation: -

- 1 Devise of Door Closure essential in each room.
- 2 Installation of control panel along with Energy Meter
- 3 Installation of APFC Panel for Maintain Power Factor 0.99
- 4 If possible, replace of 3-star rating Air Conditioner with 5-star rating.

(A 5-star rated air conditioner consumes significantly lesser power than a 3-star rated AC and is therefore more energy efficient. Based on many researches, a 5-star AC can save up to 28% more energy than a 3-star AC, on average.)

Sr. Engineer & Auditor
Er. Minti Soni





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Engineers, Power System Consultants, System Commissioning, Installation Improvement

Ref No. :

Date : 14.07.2022

ENERGY AUDIT OF GUEST HOUSE CAMPUS H.B.T.I. KANPUR

Sr. No.	Place	Equipment's	Qty.	Load/Watt	Total Load/Watt	Recommended Qty. of Equipment's	Load /Watt
1	Room No.1	Split A.C 1.5 Ton	1	1490	1490	No Change	1490
2	Room No.2 V.I.P	Window A.C 1.5 Ton	2	1610	3220	Sufficient of 1 No split A.C. 1.5 Ton As per Volume of Room	1490
3	Room No.3 V.I.P	Window A.C 1.5 Ton	2	1610	3220	Sufficient of 1 No split A.C. 1.5 Ton As per Volum of Room	1490
4	Room No.4	Split A.C 1.5 Ton	1	1490	1490	No Change	1490
5	Room No.5	Window A.C 1.5 Ton	1	1610	1610	No Change	1610
6	Room No.6	Window A.C 1.5 Ton	1	1610	1610	No Change	1610
7	Room No.7	Window A.C 1.5 Ton	1	1610	1610	No Change	1610
8	Room No.8	Window A.C 1.5 Ton	1	1610	1610	No Change	1610
9	Room No.9	Split A.C 1.5 Ton	1	1490	1490	No Change	1490
10	Room No.10	Window A.C 1.5 Ton	1	1610	1610	No Change	1610
11	Room No.11	Split A.C 1.5 Ton	1	1490	1490	No Change	1490
12	Room No.12	Window A.C 1.5 Ton	1	1610	1610	No Change	1610
13	Lounge	Split A.C 1.5 Ton	2	1490	2980	Split A.C. 2 Ton	1986
14	Dining Hall	Split A.C 1.5 Ton	2	1490	2980	Single Split A.C. 1.5 Ton	1490
15	Conference Hall	Split A.C 1.5 Ton	2	1490	2980	No Change	2980



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16	Room, lounge, conference hall, kitchen	Light, fan, Kitchen Equipment's		2000	2000	No Change	2000
		In watt		25310	33000		27056
		In Kilo watt		25.31 KW	33.00 KW		27.06 KW

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Er. Minti Soni





हरकोर्ट बटलर प्राविधिक विश्वविद्यालय

नवाबगंज, कानपुर - 208002, उ.प्र., भारत

HARCOURT BUTLER TECHNICAL UNIVERSITY

NAWABGANJ, KANPUR - 208002, U.P., INDIA

(Formerly Harcourt Butler Technological Institute, Kanpur)

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100 YEARS
1921 - 2021



HARCOURT BUTLER TECHNICAL UNIVERSITY, KANPUR

Environmental Audit

CERTIFICATE


This is to certify that the Environmental Audit for Harcourt Butler Technical University (HBTU), Located at Nawabganj, Kanpur has been conducted in Month of July 2022.

HBTU being a premier university of higher learning is aware of its responsibilities towards the environmental issues. Thus, have come forward to assess the Green practices as well as execution of existing Environmental Management System implemented in the University Campus for Water Management, Air Quality, Green Area Cover, Solid Waste Management, Knowledge of Environmental Legislations, Energy Consumption & conservation, Student Welfare Facilities & Housekeeping Practices.

This report is based on the approaches and interventions done on part of the University to address the environmental concerns of the HBTU campus. The current environmental audit represents the first stage of our efforts to build further sound environmental sustainability in the campus.

The recommendations made therein shall be helpful for much better planning for adopting sustainable environmental practices inside the University campus.


(Prof. S.K. Sharma)
Expert
Harcourt Butler Technical University
Kanpur-208002


Dr Ashutosh Tandon
External Lead Auditor



JES, Kanpur

Environmental Audit Report

**HARCOURT BUTLER TECHNICAL UNIVERSITY
KANPUR**



Prepared by



JUPITER

ENVIRO-SAFE CONSULTANTS

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(Prof. S.K. Sharma)
Professor
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ACKNOWLEDGEMENT

M/s Jupiter Enviro-Safe Consultants Environmental Audit Team is pleased to convey thanks to the management of Harcourt Butler Technical University specially Honorable Prof. Shamsher Singh, Vice Chancellor, HBTU, Prof. Sunil Kumar ,Prof. D. Parmar, Prof. J.K. Dwivedi, Er. Ashutosh Kumar Singh and Staff members of HBTU, Kanpur. We appreciate the cooperation extended to our team for completion of Green audit report successfully.

We extend our note of thanks to entire community including students club, Photography club and administration of HBTU for providing us the necessary inputs and data to carry out the vital exercise of Green Audit and field survey.

For **Jupiter Enviro-Safe Consultants**

(Dr A Tandon)







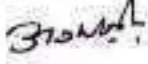

(Prof. S. K. Sharma)
Registrar
Harcourt Butler Technical University
Kanpur-208002





Harcourt Butler Technical University

Environmental Audit Team

Sr. No.	Name	Designation	Role
1.	Prof. Sunil Kumar 	Chairman Central Maintenance Committee and Dean Student Welfare	Coordinator
2.	Prof. D. Parmar 	HOD Department of Civil Engineering	Internal Auditor
3.	Mr J.K. Dwivedi Associate Prof. 	HOD Department of Electrical Engineering	Internal Auditor
4.	Er. Ashutosh Kumar Singh 	AE HBTU Central Maintenance	Internal Auditor
5.	Dr. Ashutosh Tandon 	Environmental Consultant	External Auditor
6.	Mr. Dheeraj Ganesh Mishra 	Environment Consultant	External Audit Team Member



(Prof. S.K. Sharma)

Registrar
Harcourt Butler Technical University
Kanpur-208002





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1. PREAMBLE

1.1 PROLOGUE

Environmental protection is the responsibility which is to be taken care by every mankind to save the natural diversity and to conserve natural resources for the upcoming generations. The thrust of rapid follow-up of the rules & regulations due to global competition have made Indian educational bodies as an emblem of a new India as reflected in the mandate of **National Assessment And Accreditation Council (NAAC)** for making quality assurance an integral part of the functioning of Higher Education Institutions, but simultaneously environmental problems are escalating due to increased natural resources and unsustainable consumption patterns, which deplete resources, materials and energy. The unsustainable use of renewable resources and toxic substances in such process in a indiscriminate manner reduces biodiversity and poses a threat to the environment and human health. Clean & green systems are considered to be one of the best developed strategies to provide the paradigm to put society on the path to sustainability. Environmental management planning and environmental risks are inherent in basic thoughts of any educational body, any major failure in the system due to negligence on any environmental part may lead to loss of human life and/or property and thus damage to the environment. **HARCOURT BUTLER TECHNICAL UNIVERSITY, KANPUR** retained **M/s JUPITER ENVIRO-SAFE CONSULTANTS**, Kanpur to conduct environmental audit for their both east & west campus.





Since 1921 Harcourt Butler Technical University (Formerly HBTI Kanpur) has always been a paragon and a source of inspiration in the field of science and technology. It has maintained its conspicuous presence in the technical world. H.B.T.I. has a history of realization, fulfillment of necessities and advancement in the field of science and technology. It is dedicated for the cause of rapid industrial development, creating a healthy environment for applied researches and above all to carve out men and women, having a truly rational and scientific demeanour. 'Attitude' is the watchword – taking care of which the personality of every Harcourtian is moulded. Its roots are as deep as its outlook. "Government Research Institute, Cawnpore" was established in 1920, which was renamed as "Government Technological Institute" in 1921. Finally in 1926 it got the name by which we know it today "Harcourt Butler Technological Institute". Now as per Act No. 11 of 2016 by the Government of Uttar Pradesh it become university, i.e., **Harcourt Butler Technical University Kanpur.**

The University is spread across two campuses, the east campus (77.84 acres) and the west campus (248.64 acres) situated about 3 km apart. The university campus is divided in two different sections East and West Campus. The East campus is the main institutional area and the West campus is mainly designated for residential and Hostel Area.

Harcourt Butler Technical University Kanpur has been established in year 2016 by the Government of Uttar Pradesh with a view for making it a leading Residential University to become a Centre of Excellence with focus on Research and Development and Incubation in the field of Engineering, Technology, Basic & Applied Sciences,





Humanities, Social Science & Management Architecture and other professional courses. HBTU aims to promote studies, research & innovation in Engineering areas of higher education, to enhance skill development through continuing education programme and knowledge and to achieve excellence in higher Technical education.

On academic front, the University is running Four Schools with thirteen Undergraduate Programmes in Chemical Engineering, Civil Engineering, Computer Science & Engineering, Electrical Engineering, Electronics Engineering, Information Technology, Leather Technology , Mechanical Engineering, Biochemical Engineering, Food Technology , Oil Technology, Paint Technology and Plastic Technology along with M.C.A, full time & part time M.Tech. Programme in various disciplines and going to start full time Ph.D. programme in number of disciplines as part of Quality Improvement Programme of MHRD and TEQUP-II. In view of the emerging need of the time, the University is planning to start number of Programmes at Undergraduate and Post Graduate level in the near future.

The University provides a congenial environment for the holistic growth and all round development of the students such that they become globally acceptable personalities with communication skills, proper attitudes, aptitudes, problem solving capabilities and to work as a team.

HBTU Kanpur(Formerly HBTI) has received aid from the World Bank(Phases TEQIP-I , TEQIP-II) for various developmental projects. This aid will be spent for:

- Development of the Infrastructure.
- New Laboratory equipment.





- Maintenance and repair of old laboratory equipment.
- Funding for research and lectures attended by faculty in foreign Universities.
- Aim towards community development and overall growth.

The faculty members have contributed large numbers of research papers in Indian as well as International journals. Besides, many R&D Schemes sponsored by D.S.T, U.G.C, I.C.A.R, D.R.D.O.,U.P.C.S.T., C.S.I.R., D.A.E., I.C.M.R.,D.O.E. and Ministry of Civil supplies have been successfully completed. All these accomplishments definitely prove it to be a fecund ground for nurturing intellects.

Vision:

“To achieve excellence in technical education, research and innovation.”

Mission:

1. Imparting Knowledge to develop analytical ability in science and technology to serve the industry and society at large.
2. Equip and enable students with conceptual, technical and managerial skills to transform the organization and society.
3. Inculcating entrepreneurial philosophy and innovative thinking to promote research, consultancy and institutional social responsibility.
4. Serving people, society and nation with utmost professionalism, values and ethics to make development sustainable and quality of life.





Major Initiatives Taken To Speed-Up Research Activities In the University :

A. University has a full-fledged Innovation & Incubation Centre which works under the control of the Dean, Incubation Hub.

B. University has collaborated with IIT, Kanpur by signing a MOU for the implementation of “National Initiative for Setting up of Design Innovation Centre” scheme. Some projects for the development of prototype in the following areas are already running

Education- Learning content for disadvantaged communities

Healthcare- Assistive technology and Designing of low cost medical equipment

Livelihood- Sustainable agricultural technologies, Precision manufacturing at affordable costs, Appropriate Technology for SMEs and Cottage industry

Environment- Taking proper care for various components of environment,

Disposal-Segregation and Recycling of waste.

C. Faculty & Students of the University as well as budding entrepreneurs of Kanpur and nearby areas are provided necessary assistance for entrepreneurship, startup, innovation and incubation.

D. In order to encourage entrepreneurship, startup, innovation and incubation, the Innovation & Incubation Centre use to organize various motivational events from time to time.





Research Policy of the University

- The research of the university aims to invent and develop new body of knowledge compatible to address industry and commerce issues in order to develop a better country.
- The research of the university also enables the system to provide equal opportunity to all people of the country irrespective of class category or religion.
- The university aims to facilitates our students to incubate their ideas and promote entrepreneurial thinking.
- The research activities consider to expedite its action's plan keeping in view the professional social ethics.

The university to impart the education as per the need has been divided into different sub-schools as briefed under:

School of Engineering comprises of the following branches:

- ◆ Computer science & Engineering
- ◆ Civil Engineering
- ◆ Electrical Engineering
- ◆ Electronics Engineering
- ◆ Information Technology
- ◆ Mechanical Engineering
- ◆ Masters in Computer Applications
- ◆ Central Workshop





School of Chemical Technology comprises of the following branches:

- ◆ Bio-Chemical Engineering
- ◆ Chemical Engineering
- ◆ Food Technology
- ◆ Leather Technology
- ◆ Oil Technology
- ◆ Paint Technology
- ◆ Plastic Technology

School of Basic & Applied Sciences comprises of the following branches:

- ◆ Chemistry Department
- ◆ Mathematics Department
- ◆ Physics Department

School of Humanities & Social Sciences comprises of the following branches:

- ◆ Humanities & Social Sciences Department

The Academic Programmes which are available at the university are as follows:

- ◆ Bachelors Programmes
- ◆ Masters Programmes
- ◆ Ph.D Programmes





HBTU has a willingness to share the growing concern on issues related to environment and is committed to safe guard the Environment in and around its establishment for providing safe and healthy living to all its students, staff and people concerned. Thus, to full-fill these obligations an Environmental Policy has been formulated through management systems.

FOCUS AREA OF STUDY

- Water management
- Air Pollution Management
- Noise Pollution Management
- Energy use & conservation
- Waste Management
- Green Belt area & Bio-diversity
- Environmental Initiative

1.2 SCOPE OF THE STUDY

The ideal way to look at environmental Audit is to regard it as a pragmatic management tool. Prevention of waste generation and excessive consumption of raw materials, water and energy, Creation of an environment in university complex conducive to achieving high efficiency and aesthetic look, and a hormonal relationship with the students, staff, public and regulatory authorities, are some of the objectives which are sought to be achieved by EA. Under the scope of EA, it was envisaged :



- To study air, water, noise, health of safety scenarios within the HBTU complex.
- To study possible scope for reuse / recirculation techniques to minimise pollution and waste generation.
- To identify the possible health and environmental Hazards
- To formulate guidelines for emergency preparedness plan.

1.3 METHODOLOGY

Keeping in view the nature of the activities, the environmental audit programme was carried out at HBTU in three phases.

Phase 1 : Pre - audit activities

Phase 2 : on site activities

Phase 3 : Post audit activities

1.3.1 PRE AUDIT ACTIVITIES

The pre audit activities of the project were commenced with the development of an audit plan, which included the scope of audit, priority topics to be selected, and explanation of the audit procedure. Then audit team made a visit to HBTU in order to gather background information and administer questionnaires. The main objective at this stage was to minimise the time requirements for on-site audit and maximise team productivity.

1.3.2 ON SITE ACTIVITIES

This phase began with a meeting of the audit team with the concerned personnel of the university. The maintenance engineer of



HBTU, in brief, presented the activities regarding the performed activities and pollution control measures undertaken by HBTU. The audit team familiarized themselves with different departmental activities within HBTU. Sources of liquid and solid wastes and their causes were identified. Audit team identified the wastewater sampling locations, ambient and noise monitoring locations and professional judgment was used in selecting the type and size of sample required to verify the key controls in HBTU. All observations were documented.

The on-site phase was concluded with a close out meeting between audit team and management of HBTU.

1.3.3 POST AUDIT ACTIVITIES

The draft report was prepared incorporating the air, water noise, health and safety scenarios, which was sent to HBTU for comments. An action plan is also drawn for implementation of the recommendations. Final report has been submitted to HBTU authorities for on-ward transmission to the concerned authorities.





2. WATER & WASTE WATER AUDIT

2.1 PROLOGUE

The water (prevention and control of pollution) act 1974 provides the legal framework for prevention control, and abatement of water pollution in India. The pollution boards have prescribed minimal national standards (MINAS) in terms of measures such as BOD, COD, PH and T.S.S. etc for quantification of generated waste water.

Water and waste water audit conducted at HBTU was aimed at evaluation of existing water consumption for different purposes and development of water balance scenario, highlighting the water conservation measures. The implementation possibilities for waste minimization/ pollution control through raw material recovery within the process for recycle/reuse were aimed, alongwith performance evaluation of existing waste water disposal system.

2.2. CONSENT ORDERS

After the passing of the water act in 1974, any industrial, operation or process or any treatment and disposal system likely to discharge sewage or trade effluents or a new or altered outlet for the discharge of sewage or trade effluent into a stream or well or public sewer or on land could be brought into existence only with the prior consent of the state pollution control board. [Section 25(i) as amended in 1988]. The system of consent orders is based on the principle that there could not be fixed or rigid standards for putting polluted matter in the streams and that the problem of each industry may be peculiar and variable from time to time. In granting consent



orders, the board may lay down conditions which have to be full-filed within the given time otherwise the board has powers to refuse or withdraw the consent already given.

HBTU has now taken initiatives for seeking air & water consent from U P Pollution Control Board.

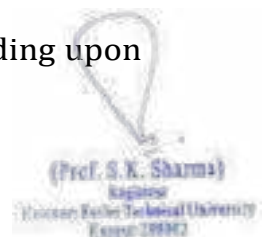
2.3 WATER & SEWERAGE TAX

Since, HBTU comes under the specified list of such govt. taxes is regularly paying its water & sewerage tax as and when the bill is raised by the Kanpur Nagar Nigam.

2.4. METHODOLOGY

The essential steps used in conducting "water and wastewater audit" were :-

1. Records and documentation review, to establish the trend of water usage w.r.t usage in both campus of HBTU.
2. Recording water quantities supplied for each campus.
3. Locating water and wastewater sampling points and analysing the water quality along with flow measurements.
4. Development of water balance sheets.
5. Identification of areas of water losses (if any) and weak areas of operation / maintenance.
6. Planning conservation / corrective measures, depending upon water costs and economics achievable.





7. Performance evaluation of existing wastewater treatment facilities and Identification of possibilities for waste minimisation recycle / reuse.

2.5 RAW WATER INTAKE

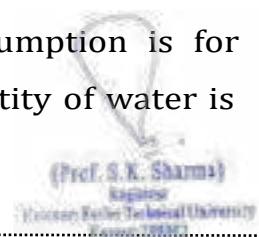
HBTU draws 695 Kl of water per day (approx.) on full capacity utilization, through existing 3 nos. of bore wells in the premises. To facilitate the lifting and drawing ground water for filling the over head tanks three Nos. of pumps of 25 HP capacity each are installed in the institutional and residential premises. The details water usage sources , OHT, pumps and their efficiency is shown in table 2.1 and 2.2, table 2.3 lists the water consumption & discharge break-up. Table 2.4 & 2.5 depicts the raw water characteristics.

2.5.1 RAW WATER STORAGE

There is one nos. of Over Head Tanks (OHT) situated in the HBTU east campus & two at the west campus. The capacity of each OHT is 300 KL with a total storage capacity of 900 KL. The Inflow and outflow of water is continuous and is maintained through three Nos. of 25 HP capacity pumps. The details of OHT's is given in table 2.2.

2.6 WATER USAGE

The activities that are being presently carried out at HBTU for fresh water consumption mainly comprises for drinking, toilets, canteen facilities, Laboratory, R&D activities & Green-Belt development requirements. The major water consumption is for domestic and gardening purposes though some quantity of water is





also used in room coolers during summers. The water consumption break-up is shown in table 2.3.

2.7 RAW AND WASTE WATER SCENARIO

The raw water is mainly ground Water which is used at both the east & west campus of HBTU The fresh water consumption mainly includes requirements for domestic & residential staff colonies purposes. It was seen that some consumption of water is for gardening/agriculture purposes since approx two third of the total area of both the campus is maintained as green belt. Table 2.4 shows the break-up of total water requirements of HBTU. The quantum of discharge from the both the campus is approx.480 KL/D and is mainly domestic in nature.

2.7.1 WASTE WATER MONITORING

Process survey and simultaneous monitoring of sectional and combined wastewater discharges were carried out within the HBTU institutional & residential campus at planned sampling locations. The waste water concentration which is being discharged is shown in tables 2.6 & 2.7 and total pollution load discharged per unit of output is given in tables 2.8 & 2.9.

2.8 EXISTING EFFLUENT TREATMENT FACILITIES

The daily generated discharge from both the campus is only domestic in nature & is presently being discharged in the main trunk sewer line of the municipal corporation. It was revealed by the internal audit team from HBTU that a Sewage Treatment Plant is to be installed in the near future.

(Prof. S. K. Sharma)
Signature





2.9 Auditor's Note / Suggestions

1. Strict control should be exercised in use of chemicals in each dept.
2. It is advisable to promptly plan for installation of STP at both the campus of university.
3. On evaluation of surplus low lying land at the west campus of the university, it is suggested that an Oxidation Pond can be easily installed for treatment of the generated domestic effluents.
5. The vegetation cover should not grow wild, instead, maintained properly to reduce erosion and raindrop impacts.
6. It should be seen that there should be no water logging at the west campus, since it is an exclusive residential campus & such water logging in the low lying areas may create breeding ground for insects & flies.
7. Periodic analysis of treated and untreated water should be practiced with all the concerned parameters.
8. 'V' notches may be installed at the final outlet drain to record the quantum of discharge.
9. Awareness camp should be organized at intervals for wise usage of water to stop any misuse or wastage of fresh water.
10. All taps & toilet fixtures should be checked on regular basis for prompt replacement/repair of any leakages.



(Prof. S.K. Sharma)
Registrar
Harcourt Butler Technical University
Kanpur-208002





TABLE:2.1
WATER USAGE SOURCES

S.NO.	USAGE
1	Institutional areas for drinking purposes
2	Labs & R& D activities
3	Toilets
4	Canteens
5	Green-Belt Development
6	Cleaning of internal Drains & Toilets
7	Hostels & residential areas
8	Construction & maintenance work

TABLE:2.2
DETAILS OF OVER HEAD TANKS

S.No.	Over Head Tank Location	Nos.	Capacity (M³)	Pump Capacity for water extraction (HP)	Efficiency of Pump
1	East Campus	1	300	25	85%
2	West Campus	2	300 Each	25 Each	80 & 90%





TABLE : 2.3 WATER REQUIREMENT AND WASTE WATER GENERATION

S. No.	Purpose	Consumption rate (Ltr./D)	Usage persons/D	Total requirement (KL/D)	Waste water (Generation @ 80% D)
1	Institutional East Campus	35	3000 (Students & 350 staff)	117.25	93.8
2	Hostel East campus (8 Nos.)	125	1034	129.25	103.4
3	Hostel West campus (8Nos.)	125	1232	154	123.2
4	Residential Staff flats (East campus)	150	365	54.75	43.8
5	Residential Staff flats (West campus)	150	1150	172.5	138
6	Labs & R & D activities	50	100	5	4
7	Green-Belt development	Say 50 KL/D	-	50	Totally consumed
8	Canteens	20	600	12	9.6
9	Security guards	35	12	0.42	0.33
	Total		7843	695.17 Say 695	516.13 Say 516





TABLE:2.

RAW WATER CHARACTERISTICS (WEST CAMPUS)

S.No.	Parameter	Unit	Result	Specification/Limit (As per IS:10500:2012)	
				Desirable	Permissible
1	Color	Hazen	<5.0	5.0	15
2	pH	-	7.21	6.5-8.5	No Relaxation
3	Turbidity	NTU	<1	1.0	5.0
4	TDS	Mg/lt	246	500	2000
5	Chloride	Mg/lt	38.42	250	1000
6	Fluoride	Mg/lt	0.26	1.0	1.5
7	Total Alkalinity	Mg/lt	128	200	600
8	Total Hardness	Mg/lt	168	200	600
9	Sulphate	Mg/lt	26.34	200	400
10	Iron	Mg/lt	<0.05	0.3	No Relaxation
11	Arsenic	Mg/lt	<0.01	0.01	0.05

Note: Detailed report from NABL accredited Lab annexed





TABLE:2.

RAW WATER CHARACTERISTICS (EAST CAMPUS)

S.No.	Parameter	Unit	Result	Specification/Limit (As per IS:10500:2012)	
				Desirable	Permissible
1	Color	Hazen	<5.0	5.0	15
2	pH	-	7.84	6.5-8.5	No Relaxation
3	Turbidity	NTU	<1	1.0	5.0
4	TDS	Mg/lt	272	500	2000
5	Chloride	Mg/lt	44.30	250	1000
6	Fluoride	Mg/lt	0.18	1.0	1.5
7	Total Alkalinity	Mg/lt	143	200	600
8	Total Hardness	Mg/lt	187	200	600
9	Sulphate	Mg/lt	28.40	200	400
10	Iron	Mg/lt	<0.05	0.3	No Relaxation
11	Arsenic	Mg/lt	<0.01	0.01	0.05

Note: Detailed report from NABL accredited Lab annexed





TABLE: 2.6
Concentration of waste water discharged
(East campus)

S.No	Parameter	Concentration (Mg/lts)
1	pH	7.6
2	BOD ₃ at 27°C	20.5
3	COD	110
4	TSS	47
5	TDS	1015
6	O & G	4.6

TABLE: 2.7
Concentration of waste water discharged
(West campus)

S.No	Parameter	Concentration (Mg/lts)
1	pH	7.8
2	BOD ₃ at 27°C	29.4
3	COD	167
4	TSS	59
5	TDS	1120
6	O & G	6.8

Note: Report from NABL accredited Lab annexed

(Prof. S. K. Sharma)
Signature
Harcourt Butler Technical University
Kanpur-208002





TABLE:2.

**Pollutants discharged to Environment/Unit of output
Sampling Date : July, 2022**

Pollutants	Quantity of pollutants discharged (Kg/Day)	Concentration of pollutants discharged (Mg/L)	Percentage of variation form prescribed standards
(A) WATER (FINAL OUTLET OF EAST CAMPUS DRAIN)			
pH	-	7.6	within the limit rage of 5.5-9.0
B.O.D ₃ . 27°C	5.2	20.5	within the limit of 30 mg/lts. (31.6% below the limit)
C.O.D.	28	110	within the limit of 250 mg/lts. (56.0% below the limit)
T.S.S.	11.9	47	within the limit of 100 mg/lts. (53% below the limit)
TDS	258.4	1015	within the limit of 2100 mg/lts. (51.6% below the limit)
Oil & Grease	1.1	4.6	within the limit of 10 mg/lts. (54% below the limit)

- Effluents discharged per day at 100% capacity utilization is max. 254.6 KLD for east campus of the university

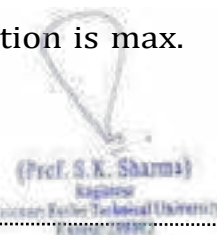




TABLE:2.9

**Pollutants discharged to Environment/Unit of output
Sampling Date : July, 2022**

Pollutants	Quantity of pollutants discharged (Kg/Day)	Concentration of pollutants discharged (Mg/L)	Percentage of variation form prescribed standards
(A) WATER (FINAL OUTLET OF WEST CAMPUS DRAIN)			
pH	-	7.8	within the limit rage of 5.5-9.0
B.O.D ₃ . 27°C	7.6	29.4	within the limit of 30 mg/lts. (2% below the limit)
C.O.D.	43.5	167	within the limit of 250 mg/lts. (33.2% below the limit)
T.S.S.	15.3	59	within the limit of 100 mg/lts. (41% below the limit)
TDS	292	1120	within the limit of 2100 mg/lts. (46.6% below the limit)
Oil & Grease	1.7	6.8	within the limit of 10 mg/lts. (32% below the limit)

- Domestic effluents discharged per day at 100% capacity utilization is max. 261 KLD for west campus of the university





Table : 3.0 Equipments /Facilities Available In The Environmental Lab

(a)	pH Meter
(b)	TDS Meter
(c)	Conductivity Meter
(d)	Electronic Balance
(e)	Mixing Assembly
(f)	COD Assembly
(g)	BOD Incubator
(h)	AAS
(i)	Glass Wares





3. ENVIRONMENTAL QUALITY AUDIT

3.1 INTRODUCTION

The air (prevention and control of pollution) act 1981 provides the legal framework for prevention, control and abatement of air pollution in India. The act describes air pollutants as any solid, liquid or gaseous substance present in the atmosphere in such a concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

HBTU has now taken initiatives for seeking air & water consent from U P Pollution Control Board.

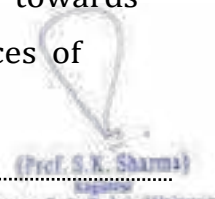
The basic purpose of Environmental Quality Audit (EQA) is to evaluate the status of the environmental management systems and Ambient Air Quality at HBTU, Vis-a-vis the regulatory requirements. Proper operation and maintenance practices help in reducing the vehicular emissions from both the campus of the university to check environmental quality deterioration.

Environmental quality can be improved if the following aspects are properly considered in management, treatment and disposal :-

- (1) Vehicular Traffic Movement
- (2) Solid / Hazardous Waste
- (3) Noise Levels

3.2 VEHICULAR EMISSIONS

Vehicular emissions play an important role towards environmental quality management and are significant sources of





pollutant emissions. The major sources of emissions that were identified at HBTU, are from the vehicle movement in the campus and D.G. sets. The major pollutants include suspended particulate matter (SPM), SO₂ and NO_x.

During audit studies, AAQ was monitored at different locations of both the university campus & the data were interpreted to quantify the pollution load. The locations identified for AAQ are shown in table 3.1 & the details of AAQ monitoring results are tabulated in table 3.2.

The analysis results of AAQ monitored at different locations of the university east campus reveal that the SO₂ and NO_x emission were found to be varying from 12.65-8.8 PPM and 25.2-20.5 PPM & for PM_{2.5} were in the range of 48-27.2 PPM & for PM₁₀ in the range of 90.5-55.1 PPM. The ambient air quality monitoring results revealed that the values meet the prescribed standards laid down by CPCB for both east & west campus of the university.

The variation in concentration of ambient air quality results is attributed to vehicular activities in and around the area. To improve the air quality and to give an aesthetic look to both the campus about two third of the total area of both the campus has been designated for green belt. The pictorial view of the greenery maintained in the premises is shown pictorial view gallery.

The university also consumes Diesel Oil for generation of electricity during power failure. The total storage capacity is one KL for HSD. The month wise diesel consumption is given in table 3.3.





3.3. SOLID / HAZARDOUS WASTES

Hazardous waste management is a new and developing field. The relatively recent concerns by pollution boards and other regulatory authorities with the danger presented by the disposal of Hazardous waste has evoked new efforts in the scientific and engineering community to develop new technologies that are capable of recycling treating and safely disposing of these materials. The pollution boards want to encourage innovations in Hazardous waste management by the way in devising regulations, therefore it is important to avoid rigid approaches that stifle the development of new technologies.

When the disposal of certain waste materials is done in a improper manner various toxic components are leached from them. These toxics are then able to find their way into surface or ground water which in return contaminate them. Solidification technique reduces the surface area of the waste, thereby dramatically reduces the leachates fractions, even if the material is not chemically destroyed.

The migration of harmful chemical constituents through ground and surface water increases contaminants in drinking water sources which in turn affect human health. The improper management of hazardous wastes may result in variety of health hazards, the severe amongst these include mutagenic, carcinogenic and teratogenic effects.

The characteristics that measure the hazard potential of a waste are corrosivity, reactivity ignitability and toxicity. The parameters which define these characteristics are summarized in

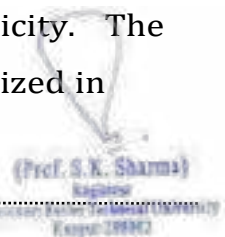




table 3.4. The approx. generation of domestic solid waste is tabulated in table 3.5

3.3.1 HAZARDOUS WASTE GENERATION :

HBTU institutional east campus generates solid / Hazardous wastes from its labs and is in process to seek Authorization of Hazardous waste generation & disposal under rule 5 of Hazardous Waste Management & Handling rules 1989 (as amended). The waste generated fall under category 33.1 and 33.2 of Hazardous waste management and handling rules 1989. The other wastes generated are construction & Demolition waste, Municipal Solid Waste & the university should also comply with the Plastic Waste Management Rules-2022. The data analysis revealed, the following category of Hazardous waste are generated :-

- Category No. 33.1
- Category No. 33.2

The main sources of Hazardous Waste generation are :

- (a) Discarded lead batteries
- (b) Waste lube oil
- (e) Sludge from Lab drains
- (f) Discarded empty chemical containers.

Table 3.6 shows the generation and subsequently usage/disposal of generated wastes.

3.3.2 SOLIDIFICATION TECHNIQUES :

There are at least six categories for solidification agents. These category are :

- Cement or silicate based

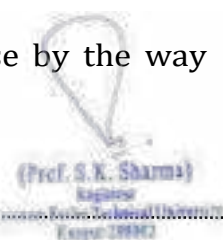




- Lime based
- Thermoplastic based
- Organic polymer based
- Ceramic based
- Encapsulation

3.3.3 AUDITORS NOTE / SUGGESTIONS

1. Land farming or land treatment of oily sludge is a recent disposal method and may be adopted at HBTU or it may be sent to authorized safe landfill site.
2. It is suggested that the sludge generated from the drains of Labs should be transported to Treatment Storage Disposal Facility(TSDF)
3. The treatment of sludge if done in-house, then prior to landfill in exclusive demarked area it should include (a) mixing with concrete in 1:4 ratio. (b) incineration at not less than 400°C in a special incinerator (c) atmospheric weathering at a controlled landfill site and (d) chemical solidification.
4. A high standard of personal hygiene is essential when handling Lab generated waste. Persons involve in handling such wastes should wear suitable impervious protective clothing, especial gloves and good washing facilities should be available at site.
5. Diesel driven vehicles may be replaced with E-Vehicles.
6. The existing green-belt may be further made dense by the way of adopting “Miyawaki Technique” of plantation.





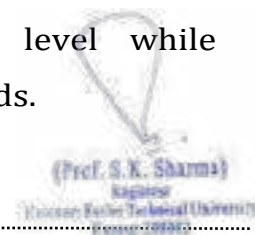
3.4.4 IMPROVING HOUSEKEEPING PRACTICES

Improving housekeeping practices can be made rapidly with little capital investment. Successfully implemented, these changes can result in increased aesthetic look of the university campus and improved workplace safety, as well as reduction in hazardous waste generation. Reducing hazardous waste generation can yield significant savings in raw material usage and wastewater treatment. The following list of housekeeping practices, although not all-inclusive, could save thousands of rupees a year.

- Repair all leaking tanks, pumps, valves, etc.
- Inspect all leaking water fixtures
- Install high-level alarms on over head storage tanks.
- Minimize the volume of water used during the cleanup operations.

3.5 NOISE LEVELS AND COMPLIANCE

Sound is generated by many activities associated with the university operations. Sound is perceived as noise when it impinges on human activities through close proximity of people to sound sources and inadequate shielding which can cause both physiological and psychological damage to human beings. The noise may produce mental stress,, fatigue, dizziness and loss of balance and effect work, recreation, sleep communication and rest. There are two major categories of noise, continuous and intermittent. Continuous noises usually have a rather stable level while intermittent noises are any fluctuating, repetitive sounds.





The intensity of noise depends upon the design noise levels of the machines and its operation and maintenance practices. The major sources of noise at HBTU are D.G. sets, lecture halls, hostel mess, canteens and work shop.

The sources of noise at HBTU and their levels as provided are shown in table 3.7 & table 3.8 shows the permissible noise exposure levels for such institutional campus.

3.5.1 Auditor's note / Suggestions

1. Noise levels are within the stipulated criteria
3. Noise awareness programmes may be conducted among the students/staff
4. HBTU has already launched a massive tree plantation programme within its premises and outside its boundary.
5. It is suggested to acoustically insulate the lecture halls & DG sets.
6. staff/students working in high noise areas should be provided with Protective devices such as ear - muffs, ear-plugs and should be instructed to use these devices religiously.





Table: 3.1 Ambient Air Quality Monitoring Locations

S.No.	Location
1.	Near main gate (East Campus)
2.	Near Auditorium (East Campus)
3.	Near Lake View Hostel(East Campus)
4.	Near main gate (West Campus)
5.	Near staff quarters (West Campus)
6.	Near Hostel area (West Campus)

Table: 3.2 Ambient Air Quality Monitoring Results

Location	Parameter				
	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	CO ($\mu\text{g}/\text{m}^3$)
Near main gate (East Campus)	48.10	90.5	12.65	25.2	0.75
Near Auditorium (East Campus)	28.90	55.10	8.80	20.50	0.60
Near Lake View Hostel(East Campus)	27.20	59.80	9.50	21.80	0.32
Near main gate (West Campus)	30.90	68.20	8.95	19.20	0.28
Near staff quarters (West Campus)	29.30	59.50	9.20	20.10	0.30
Near Hostel area (West Campus)	25.70	53.40	8.10	18.50	0.35





Table:3.3 Details Of Diesel Consumption (East & West campus) I DG Sets

S.No.	Month	Approx.Consumption (Lts)
1.	April 21	50
2.	May 21	55
3.	June 21	60
4.	July 21	65
5.	August 21	60
6.	September 21	55
7.	October 21	55
8.	November 21	60
9.	December 21	60
10.	January 22	62
11.	February 22	58
12.	March 22	60
	Total	700

Note:

**Diesel consumption in official vehicles was @264 Lts/M
Petrol consumption in official vehicles was @489 Lts/M**





Table 3.4 : Parameters Of Hazard Potential

S.NO.	Parameters	Characteristics
1.	Corrosivity	Wastes which have a pH of less than 2 or greater than 12, or which corrode steel at rate greater than 6.35 mm per year at 55 ⁰ C
2.	Reactivity	Wastes, which are unstable and spontaneously react with water or air generate toxic gases and explode due to shock or heat.
3.	Ignitability	Wastes, which spontaneously ignite in dry or moist air or heat.
4.	Toxicity	Wastes which release toxic materials on leaching in sufficient amount to pose a substantial hazard to human health or environment as measured by the toxicity characteristics leaching procedure (US, EPA)

Table:3.5 Municipal Solid Waste Generation from Human and Commercial Activities from east & West campus of University

S.No.	Description	Population	Total Waste generation
1.	Total Residential (Staff)	1515	606@ 0.4 kg/capita/day
2.	Total students Hostels	2266	226.6@ 0.1 kg/capita/day
2.	Utilities / facilities and Commercial (30% of total residence)	1134	453.6@ 0.4 kg/capita/day
	Total	5304	1286.2 Say 1286

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JES, Kanpur

**Table : 3.6 Solid Waste****(As specified under Hazardous waste/management and Handling Rules, 1989)**

Hazardous Waste	Total Quality (T)		
	Item	Generation	
		During the previous financial year 2020-2021	During the current financial year 2021-2022
i) From east & west campus	Empty chemical containers	70 Kg.	190 Kg.
	Used Oil / lube Oil	150 lts	75 lts
	Battery Scrap &E-waste	30 Kg	50 Kg
ii) Sludge from internal waste water drains			
a) East campus	Sludge	1 tractor trolleys	3 tractor trolleys
b) West campus	Sludge	2 tractor trolleys	5 tractor trolleys
c) Hostel & residential areas	Kitchen waste	Not measured	Not measured
iii) Uses of Solid Waste & Disposal			
a) Drain sludge	Sludge from drain cleaning	100% as land fill	100% as land fill
b) Empty chemical containers	Empty chemical containers	Stored/partially reused	Stored/partially reused
c) commercial valued scrap items	Metal Scrap	100% sold to authorized vendors	100% sold to authorized vendors
d) Used Lube oil	Waste oils	100% sold to authorized vendors	100% sold to authorized vendors
e) Battery Scrap & E-waste	Worn out batteries & E-waste	Presently stored in departments itself	Presently stored in departments itself
f) Kitchen/ canteen waste	Kitchen/canteen waste	As cattle feed	As cattle feed





Table 3.7 : Noise Level At Different Locations of university

S.No.	Source	Noise Level dB (A)
1.	D.G. Set Area	85
2.	Inside Academic Areas	52
3.	Fabrication Shop	75
4.	Near Auditorium	62
5.	Near Parking Area	66
6.	Administrative Block	60
7.	At main gate	70
8.	Inside Canteen	71
9.	East campus Lake view Hostel	70
10.	East campus Lake view Hostel Mess	74
11.	West Campus Main Gate	77
12.	West Campus Near Hostel Area	69
13.	West Campus Near Residential Staff Blocks	61
14.	West Campus Hostel Mess	71





Table:3.8 Permissible Noise Exposure (Working Areas)

Exposure Time (hrs/day)	Limit in dB (A)
8	90
4	93
2	96
1	99
1/2	102
1/4	105
1/8	108
1/16	111
1/32 (2 min. or less)	114

Exposure to continuous or intermittent noise louder than 115 dB (A) should not be permitted. Exposure to pulse or impact noise should not exceed 140 dB (Peak acoustic pressure)





ANY OTHER PARTICULARS IN RESPECT OF ENVIRONMENTAL PROTECTION AND ABATEMENT OF POLLUTION

- (i) Fast & high growing trees will be planted in vacant Areas in and around the university boundary
- (ii) Awareness programmes for environmental protection will be launched.
- (iii) The university authorities have planned to install a Sewage Treatment Plant (STP) for east & west campus.
- (iv) The university has planned to fulfill the stipulated compliances/consents as needed by the pollution abatement authorities in near future.





4. HEALTH AND SAFETY AUDIT

4.1 PROLOGUE

The broad objectives of the health and safety Audit studies undertaken at HBTU, Kanpur , was to critically evaluate the safety and health programmes ; particularly the systems provided to identify and control hazards; and ensure that they not only comply with the minimum statutory standards but also meet the standard codes of practices.

4.2 SCOPE

Audit studies undertaken covered the following aspects of HBTU:-

- (i) Safety in storage and transportation of chemicals used in HBTU Labs
- (ii) Safe handling of chemicals during lab work
- (iii) Chemical Hazards and their control - covering ventilation and exhaust systems, work zone environment monitoring and personal protective equipments.
- (iv) Fire prevention and protection
- (v) Safety management
- (vi) Emergency preparedness

The following aspects were covered under "Safety management" aspect:

- (i) Safety policy





- (ii) Involvement of all departmental heads
- (iii) Assignment of responsibility and Accountability
- (iv) Safety department
- (v) Safety manual
- (vi) Safety training of some academic & office staff.
- (vii) Accident reporting, investigation and analysis
- (viii) Safety promotion and publicity
- (ix) Medical Department first-aid, periodical medical examinations etc.

4.3 METHODOLOGY

"Methodology" adopted for conducting Health and Safety Audit at HBTU is enumerated as follows :

1. Preliminary information was collected through questionnaire to assess the existing systems.
2. Audit exercises including the time frame, special focus areas, collection and study of relevant records, safety manuals were planned
3. Pre-Audit meeting was conducted with concerned personnel of HBTU and objectives and methodology was explained to obtain their support.
4. All Academic areas / lecture rooms were visited, following the class schedule.
5. Inspection of all supporting services of HBTU like sub-station, , chemical stores, workshop was undertaken during "on-site"



and discussed with HOD`s supervisors and workers regarding the safety and health aspects.

6. Perusal of records and study of key documents was undertaken
7. Fire and medical departments were visited.

HBTU has given high priority to safety and has a relatively good record. The potential hazard, financial cost and losses as well as growing awareness about the above dangers require HBTU to spend considerable efforts for loss prevention and reducing risk of accidents.

4.4 SAFETY MANAGEMENT

During our audit studies, it was observed that the university has always given its full concern towards implementing and compliance of safety standards as stipulated.

Documentation review was undertaken during our studies which spoke about their high safety standards. The university holds a record of maximum working days of safe academic activities.

4.4.1 SAFETY POLICY

HBTU believes that the safety of each student/staff is the fundamental responsibility of the university and hence safety must be thoroughly integrated with efforts to produce high quality education & placement. It was observed that the safety policy which is recently approved by the university concerned is well defined. A copy of the policy is being made available to all concerned HOD`s, it should further be displayed at prominent locations. It was observed

(Prof. S.K. Sharma)





that there is an effective routine flow of health / safety & other relevant information at all appropriate levels through formal mechanism i.e. line management and framed committees for the purpose.

AUDITOR'S NOTE SUGGESTIONS

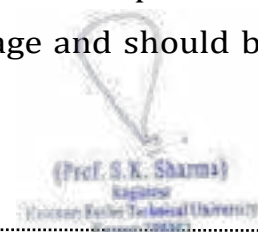
1. The internal audit of the university is presently carried out by designated group with HOD of the concerned department once in two years as per their existing practice. It is suggested that the same should be conducted by a multi-disciplinary team and frequency should be increased.
2. It is required to strengthen the awareness among the students/staff regarding the safety aspects through proper motivation like arranging safety slogan contest, quiz contest etc.

4.4.2 SAFETY DEPARTMENT

The university has a designated safety system as required for maintaining discipline & to meet out any security threat. The safety personnel have adequate equipments for safety and monitoring process. Safety functions needs to be further reinforced to give special emphasis on unauthorized entry in the university campus.

4.4.3 SAFETY MANUALS

Safety manuals, fire emergency manuals, may be published and distributed once a year. Manuals on safety & health aspects are to be procured both in English and regional language and should be made available to all HOD`s & DSW.





4.4.4 SAFETY TRAINING

Training in fire prevention and safety related topics should also be a designated activity of the university. The training on the following topics may be arranged :

- (i) Basics of fire prevention and fire fighting.
- (ii) Usage and limitations of safety equipments.
- (iii) Role of HOD`s & all concerned in Safety.

AUDITOR'S NOTE / SUGGESTION

The following should also be included in training programmes :

- (i) First-aid training
- (ii) Safety aspects during chemical handling.
- (iii) It is observed that presently only few staff are trained to use fire - extinguishers. The number of such trained staff & student volunteers may be increased.
- (iv) Fire escape routes should be identified and clearly indicated especially in student hostels.

4.4.5 MEDICAL FACILITIES AVAILABLE AT HBTU

1. A well equipped dispensary with qualified doctor and staff is available in the university east campus the serious injured or sick are referred to the collaborated nursing homes in the vicinity. The first aid centre works during day time for primary

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first aid services and serious cases are sent to hospitals. First aid boxes are also provided in each department. The general illness cases treated at the first aid centre is shown in table 4.1

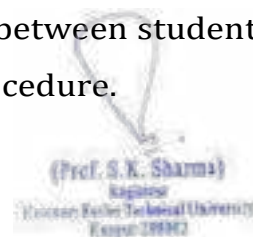
2. Periodical medical test of students/staff may also be practiced..

AUDITOR'S NOTE / SUGGESTIONS

1. It was observed that in most of the cases, the root cause of accidents was not generally stated in the reports. It is suggested that it is a must to establish the root cause to arrive at correct scenario.
2. It is observed that students/staff handling the chemicals are not using personal protective equipments like acid / alkali proof gloves, force shield, PVC apron, gum boots to the tune of 100%. It is felt that safe procedures for handling the chemicals should be explained and displayed to ensure the optimum usage of safety equipments.
3. During the study it was observed that ventilation in some Labs is not good and adequate air circulation has to be maintained by providing exhaust fan and forced draft system. The fume respirators and air masks shall be periodically inspected by the safety personnel.
4. "Goggles use" in required labs should be made compulsory.

4.4.6 SAFETY PROMOTION AND PUBLICITY

Communication system should be developed between students and staff on safety aspects through some Safety procedure.





Equipments Requirement for in-house safety promotion within university campus

- (i) External Telephone
- (ii) Internal Telephone
- (iii) Cell Phone
- (iv) Site Plan with details
- (v) Municipal map of surroundings showing concentration of population as appropriate with major safety and fire fighting facilities available.
- (vi) Format display containing names of key personnel in the university and outside authorities along with their names, telephone numbers and residential addresses.
- (vii) Public address system

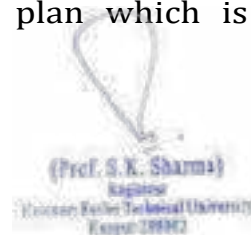
4.4.7.1 COMMUNICATION SYSTEM

In case of emergency the effective functioning of communication system plays a vital role. It helps for an early action and lot of time could be saved for communication. At HBTU the facilities for communication, internal and external, are as follows:

- Internal telephone sets
- Cellular phones.

4.5 SAFETY IN STORAGE, HANDLING AND TRANSPORTATION OF CHEMICALS

The university has an on - site emergency plan which is satisfactory for an university of its size.





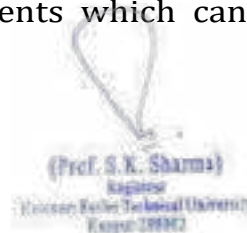
The chemicals are stored in separate storage areas the solvent used are stored in specially designed area within the university east premises. The department store obtains the required material from the main store and effect supply to the user departments according to their requirements.

4.5.1 AUDITOR'S NOTE / SUGGESTIONS

- i) Cautionary notices with the precautions to be taken during any spillage or any bodily contacts due to mishandling should be displayed near the storage and user department areas.
- ii) The university staff & students should be made aware of the planned colour codes which will be used within the university in near future.
- iii) It should be ensured that maximum staff member/student shall be well-versed in handling any emergency situation and their roles in team work should be well defined.

4.5.2 ANALYSIS OF STORAGE SAFETY

Identification of hazards is of prime significance in safety and health audit. A classical definition of hazard states that hazard is in fact the characteristics of system / chemical storage that presents potential for an accident. Hence, all the chemicals / fuels stored need to be thoroughly examined to assess their potential for initiating an unplanned event / sequence of events which can be termed as an accident.





Estimation of probability of occurrence of an unexpected event and its consequences form the basis for quantification of risk in terms of damage to property, environment or personnel.

The following two methods for hazard identification have been employed in this study :

1. Based on manufacture, storage and import of Hazardous chemical rules, 1989 of government of India (GOI rules 1989)
2. Identification of storage areas based on relative ranking technique, viz; fire explosion and toxicity index (FETI)

Table 4.2 highlights lists the hazardous properties of major chemicals used or stored at HBTU. Table 4.3 depicts the applicable GOI rules for storage of hazardous chemicals.

The risk and consequence analysis report provided by HBTU reveal that safe distances are available for Lab gases, O₂, LPG, and HSD storage in case of explosion or fire.

4.6 LAB & WORKSHOP SAFETY

At HBTU it was observed that the equipments, machines and control systems are modern and based on fail safe principles in operation and are of reputed make. It is suggested that the process operating manuals should be regularly reviewed and updated as required. However it is recommended that procedures are to be formalised and maintenance of separate registers for safety interlock / trips giving their status whenever these are bypassed is a must. It is advised to introduce MIS on the status of trips and interlocks bypassed to enable management to take appropriate actions as deemed necessary.

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Vice-Chancellor
Harcourt Butler Technical University
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4.7 CHEMICAL HAZARD AND THEIR CONTROL

In order to ensure safety of the students/staff personal safety equipments as listed in table 4.4 are to be issued to students/staff. The HOD's should be instructed to have a close watch on the usage of these equipments by the students/staff. The students should also be well trained in using the personal protective equipments. Table 4.5 lists the major hazard areas and probable causes of fire in the university.

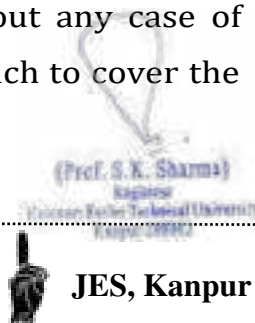
4.8 FIRE PREVENTION FACILITIES

4.8.1 FIRE WATER NETWORK

A well maintained internal cement lined fire water static tank is present at the west campus as per fire insurance regulations. Thereafter, the hydrants and monitors should be checked as per schedule and the records should be maintained. The fire water network should always be kept charged at a maximum pressure of 5 kg / cm². It is suggested for installation of low pressure alarms at fire control room and at High lift pump house. These alarms actuate when the pressure falls to 3 kg/cm² so that the marked pressure can be boosted up by running another fire water pump without loss of time.

4.8.2 REQUIREMENT OF WATER MONITORS

There should be 2" water monitors to meet out any case of eventuality. The fire hydrants should be located as such to cover the





full university premises, it should also be seen that they also follow the TAC guidelines.

4.8.3 DCP AND CO₂ EXTINGUISHERS / HALON SYSTEM

All the installed fire extinguishers were inspected and tested & it was found that they are as per schedule and records are maintained through CARDEX system, the history of each fire tender is logged in the history cards.

4.8.7 AUDITOR'S NOTE / SUGGESTIONS

As per procedure, one mobile equipment vehicle and one more ambulance are also required to reach the accident site in any case of emergency. It is suggested that regular mock drill shall be conducted at least every year and disaster mock drill once in six months.

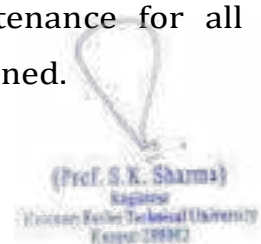
4.9 ELECTRICAL SAFETY

4.9.1 RELAYS

All electrical relays are checked at intervals and records are being maintained. It is suggested that the frequency of checking should be one year.

4.9.2 PREVENTIVE / PREDICTIVE MAINTENANCE OF MOTORS, BREAKERS AND TERMINAL BOXES

Most of these equipment are attended as and when required. It is suggested that predictive and preventive maintenance for all equipment should be carried out and records maintained.





4.9.3 PREVENTIVE MAINTENANCE OF TRANSFORMERS

All transformers are checked on a yearly schedule for acidity, dielectric strength, earth-pit resistances and records are maintained.

4.9.4 EARTH RESISTANCE OF OTHER EQUIPMENT AND STORAGE TANKS

The earth resistance is checked whenever earthing strip is found broken/disengaged. HBTU maintenance dept. may review this practice. It would be advisable to check earthing resistance once a year and records maintained.

4.9.5 PREDICTIVE /PREVENTIVE MAINTENANCE FOR ELECTRICAL EQUIPMENTS

Regarding predictive / preventive maintenance, testing of electrical relays is done for limited equipment. All equipment are to be covered under predictive / preventive maintenance and the critical relays shall be tested and calibrated once a year. The test records have to be well documented.

4.9.6 PRESSURISATION SYSTEM OF ELECTRICAL SUBSTATION

Feasibility of pressurization of electrical substation may be further re-examined to access the vulnerability of substation administrative building, class-rooms etc. from storage area of LPG, Lab used gas cylinders and HSD.





AUDITORS NOTE/SUGGESTIONS

- i) Schedule maintenance of the required vulnerable areas should be practiced.
- ii) Exhaust fans should be provided to extract fumes and emissions from general & research labs.
- iii) No combustible material should be stored in compressed gas cylinder area.
- iv) Emergency lights may also be provided in such areas to face any case of eventuality.





Table:4.1 Details Of Case Treated At First Aid Centre

Month	General illness cases
Oct. 21	98
Nov, 21	45
Dec.21	21
Jan.22	48
Feb.22	52
Mar 22	28
Apr.22	44
May 22	39
June 22	42





Table:4.2 Hazardous properties of major chemicals used or stored

S.No.	Name of Chemical	State	Toxicity	Flammability	Reactivity
1.	H ₂ SO ₄	Liquid	1 mg/m ³	Non-combustible	Moderate
2.	HCL	Liquid	5 ppm	Non-combustible	Non-Reactive
3.	LPG	Liquefied Gas	10 ppm	Flammable (1A)	Slightly
4.	HSD	Liquid	-	Flammable (1C)	-





Table:4.3 Applicable rules for storage of Major Chemicals Used

S.No.	Name of Chemical	Listed in Schedule No.	Stored/ Quantity	Threshold Quantity for Applicability of Rules (T)		Applicable Rules
				5,7-9,13-15	10-12	
1.	LPG	1(II)	200 Kg.	15	200	4(1)(a), 4(2)(i)
2.	HCL	1(II)	100 Kg.	NA	NA	4(1)(a), 4(2)(i), 17
3.	H ₂ SO ₄	1(II)	100 Kg.	NA	NA	4(1)(a), 4(2)(i), 17
4.	Caustic	1(I)(a)	100 Kg.	NA	NA	4(1)(a), 4(2)(i), 7-15
5.	HSD	-	500 Lts	1000	5000	4(1)(a), 4(2)(i)





Table 4.4 : Personal Safety Equipments

S.No.	EQUIPMENTS
1.	Safety Helmets
2.	Ear Muffs
3.	Acid Protection Goggles
4.	Gas Cutting Goggles
5.	Plastic Spectacles
6.	Face Shield
7.	Hand Gloves PVC (Acid and Alkali Proof)
8.	Hand Gloves-White Rubber
9.	Hand Gloves – Electrically Tested
10.	Gum Boots – Electrically Tested
11.	Self Contained Breathing Apparatus Sets
12.	Safety Belts
13.	Gas Testers
14.	Fire Entry Suits



Table:4.5 Major Hazard Areas And Probable Cause Of Fire

HAZARD	AREA	PROBABLE CAUSE
Fire	(a) LPG Storage	Leakage of LPG Through valves, flanges, pipelines, tanks, etc., and any source of ignition
	(b) HSD Storage Tank	- (a) Tank on fire (b) Leakage oil through valves, flanges, pipelines, tanks etc. or any source of ignition
Explosion	(a) LPG& other lab gas Storage	Leakage from the storage tank can form a flammable could and its subsequent ignition.





Table: 4.6 Parameters Of Hazard Potential

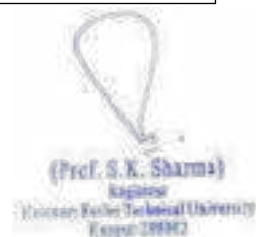
S.NO.	Parameters	Characteristics
1.	Corrosivity	Wastes which have a pH of less than 2 or greater than 12, or which corrode steel at rate greater than 6.35 mm per year at 55°C
2.	Reactivity	Wastes, which are unstable and spontaneously react with water or air generate toxic gases and explode due to shock or heat.
3.	Ignitability	Wastes, which spontaneously ignite in dry or moist air or heat.
4.	Toxicity	Wastes which release toxic materials on leaching in sufficient amounts to pose a substantial hazard to human health or environment as measured by the toxicity characteristics leaching procedure (US, EPA)





TABLE 4.7 : FIRE FIGHTING EQUIPMENT

(A) Fire Fighting Vehicles		
Ambulance	-	1 No.
(B) Extinguishers		
5 to 70 Kg D.C.P. extinguishers	-	1
3.2 to 2.25 Kg CO ₂ extinguishers	-	5
9 Lts Soda acid extinguishers	-	5
5 Kg Halon extinguishers	-	1
9 Lts to 50 Lts foam extinguishers	-	2
ABC Type extinguishers		10
(C) Fire Fighting Equipments		
Fire hoses	-	4
Water nozzles	-	4
Sand buckets	-	50





5. ENVIRONMENTAL MANAGEMENT PLAN

This chapter describes the environmental management measures required to minimize the adverse impacts due to academic & else allied activities including pollution control measures and development of green belt to overcome the adverse effects. Long-term environmental management options such as the formation of an environmental management cell are also given.

1 POLLUTION CONTROL MEASURES

Considering the various potential sources of pollution, pollution control measures are suggested at either the source of pollution or the receiving environmental component. Formulation of these measures at the planning stage rather than after the implementation stage of the project development will help to keep the pollution control cost to a minimum. The pollution control measures for the present phase is described below :

(i) Air Pollution Control

Good house-keeping including regular disposal of domestic refuse & air borne dust are measures to preserve the ambient air quality of the surrounding area. The HBTU has already installed stacks of recommended height on gen-sets to minimize air pollution from its premises. The suspended particulate matter emitted from the other activities still needs proper entrapment device to further minimize the air pollution



from the premises. Ambient air quality / stack monitoring should be practiced at least yearly.

(ii) Noise Pollution Control :

The sources of Noise Pollution are the vehicular traffic coming in and out of the premises & gen-sets. The green belt of 2.5 mtrs. wide inside throughout the campus, adjacent to the boundary wall will act as a barrier to effectively reduce noise level from outside sources.

(iii) Water Pollution Control :

The sources of waste water generated from HBTU is mainly domestic in nature which is being presently discharged in corporation main trunk sewer line. The installation of STP should be planned accordingly.

(iv) Green Belt Development :

HBTU has to further develop 2.5 mtrs. wide green belt inside the university boundary. Improvement and more plantation of particular species for control of air and noise pollution are recommended. Choice of species shall be based on gaseous exchange capacity of foliage which is ascertained by following characteristic :

- (a) The plant shall be fast growing,
- (b) It shall have thick canopy cover,
- (c) It shall be perennial and evergreen,
- (d) It shall have large leaf area index,





- (e) It shall be indigenous,
- (f) It shall be efficient in absorbing pollutants without.

Significantly effecting plant growth.

For roadside plantation, the following species are generally considered suitable :

- (a) Cassia Seamea (Cassia),
- (b) Peltophorum SP (Walf),
- (c) Samanea Saman (Raintree),
- (d) Putrnjiva Maculata (Madurai shade tree),
- (e) Saraca India (Ashoka)
- (f) Pongamia Glabra (Karaji)
- (g) Greviullea robusta (Silver oak)
- (h) Bauhinia Varriequata (Bahunia)
- (i) Spathodea Comoanualala (Spathodea) and
- (j) Gmelina arborea (Gambhar)

Minimum two rows of plants are required for road side plantation to minimize the pollution effects. Care shall be taken to ensure that the plants in the second row are staggered between the plant of first row.

Plant species for protection against gases and particulates :

- (a) Butea monosperma (Dhak)
- (b) Cassia fistura (Aamaltash)
- (c) Cassia siamea (Kassod)





- (d) Casurina Equiactifolir (Junglisuru)
- (e) Citrila Toona (Mahaneem)
- (f) Daldergia sissoo (Shisham)
- (g) Dillenia indica (Chalta)
- (h) Erythrina suber osa (Daldhak)
- (i) Ficus religiosa (Pipal)
- (j) Handwickia binata (Anjan)
- (k) Matchuca indica (Mahua) and
- (l) Millingtonia hortensis (Akash nim)

Plant species for reduction against noise level :

- (a) Aazadirachta indica (Neem)
- (b) Aegle marmelos (Bel)
- (c) Cassia Siamia (Chakundi)
- (d) Albizzia tracera (Dhala sirisa)
- (e) Carissa carandas (Karoundha)
- (f) Peltophorum inerme (Perungondrai)
- (g) Saraca indica (Ashoka)
- (h) Syzgium cimunii (Zaman)
- (i) Tamarindus indica (Imli)
- (j) Thivetia peruviana (Pilekaner)
- (k) Pongania pinnata (Beng)





2. ENVIRONMENTAL MANAGEMENT CELL

HBTU has to setup an Environmental Management Cell (EMC) to address environmental management concerns related to university. The cell will be manned by qualified persons who will be responsible for regular environmental quality monitoring proper operation of pollution control equipments and liaison with regulatory bodies such as Central Pollution Control Board (CPCB) and the Uttar Pradesh Pollution Control Board (UPPCB).

(i) Functions of EMC

The EMC will monitor the environmental aspects of the university. The cell personal will visit the different departments to make sure that EMP is implemented. During the academic session of the university, the EMC of the HBTU will be responsible for the following :

- To monitor and analyze air, noise & water samples on a regular basis.
- To ensure systematic and routine house keeping at the different departments of the university campus.
- To maintain green belt inside and outside the university campus.
- To create awareness of pollution hazards among all personnel/students.

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- Monitor and control water leakage or damage if any during the university academic sessions.

(ii) Personnel & Equipments :

The EMC will be headed by an manager (Environment), who will have overall basic knowledge of Pollution Control Equipment and their maintenance, environmental laws & standards and will be able to manage the cell independently. A chief chemist who will be capable of carrying out analysis and preparing reports and data sheets will support the EMC in-charge. He should have sufficient knowledge of sampling and analysis of environmental parameters. In addition the following staff a recommended in the laboratory :

- One Laboratory In-charge
- One Chemist
- One Field Assistant

The Analytical Laboratory already existing in the university should be involved in the EMC to carry out routine analysis & the lab should be equipped with the following instruments :

- A good quality “Noise Meter”, particularly useful for noise survey which is known as “Survey Noise Meter”, should be purchased.





- A good quality “Noise Dose Meter” to understand the extent of exposure of students/staff during academic hours, should also be procured and used for monitoring.
- Facilities for water quality assessment to be procured are as follows :
 - ◆ Single Pan Balance
 - ◆ pH meter
 - ◆ Conductivity Meter
 - ◆ Turbidimeter
 - ◆ Ion Analyser for nitrates, sulphates
 - ◆ BOD/COD analyzing system
 - ◆ Chlorides and Fluorides Testing kit
- Facilities for air quality assessment to be procured are as follows :
 - ◆ High Volume Sampler
 - ◆ Stack Monitoring System

3. SCHEDULE OF MONITORING PLAN

The schedule of monitoring plan will be divided into two sets of activities. Environmental monitoring should be carried at representative locations to ensure that the environmental quality in the surroundings of the HBTU is maintained and enhanced.

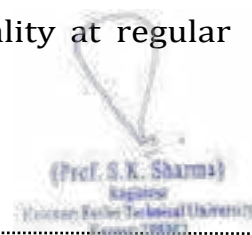




(i) Environmental Monitoring :

To monitor the extent to environmental impacts due to the ongoing academic & allied activities, it is advisable to periodically monitor the ambient environmental quality surrounding the HBTU. This section describes the environmental quality monitoring detailing number and location of sampling stations, parameters to be monitored, frequency of sampling etc. The following environmental components will be monitored on a regular basis surrounding the university.

- Level of SO₂ and NO_x and PM in surroundings of the university campus will be monitored at three hourly intervals for 24 hours and CO (for a duration of 24 hours at one hour intervals) at least once a year. In addition, one micro metrological station may be installed at HBTU. Data collected will be digitally recorded.
- Noise monitoring will be carried out near the periphery of HBTU once in three months. Portable noise meters will be used for the purpose.
- HBTU being a academic institute so it becomes necessary to monitor the raw water quality at regular intervals.





4. EXPECTED COST INCURRED TO IMPLEMENT EMP

The cost of EMP given here includes only for the laboratory / analysis facilities and green belt development. The cost of laboratory equipment suggested is expected to cost approximately 6 lacs. The cost of green belt development is expected to be Rs. 5.5 lacs. The solid waste that is generated from the HBTU hostel mess/canteens is of food grade. Hence should be totally sold as cattle-feed or bio-composting.





6. DEVELOPMENT OF GREEN BELT

The HBTU authorities have always stressed the need of appropriate green belt area within & outside the university boundary. Thus the university has covered the maximum available area for development of green belt. To further increase the green-belt area the scheme is proposed as follows:

As per the movement of the prevailing wind direction at the plant site on yearly average basis, it can be said that the wind can rotate through all the angles and the specific direction movement cannot be considered.

Thus considering the scattered nature of fugitive emissions sources it is proposed to carry out extensive tree plantation along the roads, fuel stockpile and all other areas wherever feasible. In areas where it is not feasible to plant tall trees, shrubs and bushes are to be planted.

The guidelines for development of G.B. around and inside the unit are described in subsequent paras.

GENERAL GUIDE LINES :

Trees growing upto 10 mtr. or more in height should be planted around the installation.

- Planting of trees should be undertaken in appropriate encircling rows around the installation in alternating rows to prevent horizontal pollution dispersion.





- Trees should be planted along the roadsides, to arrest the dust, auto-exhaust and noise pollution in such a way that there is no sight to the installation when viewed from a point outside foliage perimeter.
- Since tree trunks are normally devoid of foliage (upto 2 mtrs.), it would be appropriate to have shrubs in front of such trees to give coverage to this portion.
- Fast growing trees with thick perennial foliage should be grown, as it will take years for trees to grow to their full height.

The suitable plant species for development of green belt are enumerated as shown in the table.

Plant Species Identified for Green Belt Development

S.No.	Plant Species	Vernacular Name
1.	Alibizzia lebbek	Kalsiris
2.	Terminalia arjuna	Arjun
3.	Cassia Fistual	amaltas
4.	Polyalthia longifolia	Asoka
5.	Embelica officianalis	Amala
6.	Bauhinia variegata	Kachnar
7.	Mitragyna parviflora	Kadamb
8.	Pongamia pinnata	Kranj
9.	Cassia siamea	Kasod
10.	Dalbergia sissoo	Sheesham
11.	Delonix regia	Gulmohar





12.	Ficus glomerata	Gular
13.	Acacia nilotica	Keekar
14.	Cacia catechu	Khair
15.	Acacia arabica	Babul
16.	Syzygium cumini	Jamun
17.	Mimusops elangi	Maulsiri
18.	Madhuca indica	Mahua
19.	Ficus bengalensis	Bargad
20.	Ficus religiosa	Peepal
21.	Azadirachta indica	Neem
22.	Casurina equisetifolia	Jhau
SHRUB		
23.	Nerium odourum	Kaner
24.	Parkinsonia aculeate	Vilayati Jhau
25.	Hibiscus rosasinesis	Gudhal
26.	Dracaena	
27.	Callistemon lanceolatus	Bottle brush
28.	Salvadora oleoids	Peelu
29.	Zizyphus mauritiana	Ber
30.	Lantana camara	Kuri
31.	prosopisjuliflora	Vilayati babul





The plant-to-plant and row-to-row spacing on each greenbelt strip is 5 mtr. Depending upon the width of the greenbelt, the number of plant rows in each green belt varies from 4 to 17.

On roadsides 3 or 2 rows of plants on either side, the tree positions in the first row on either side will be in a staggering fashion with respect to those in the first row. In case of tree positions on the greenbelt strips also, tree positions in each row will be in a staggering fashion with respect to those on either side rows.





7. GUIDELINES FOR EMERGENCY PREPAREDNESS PLAN

7.1 INTRODUCTION

The off-site emergency plan is an integral part of any major hazard control system. It should be based on those accidents identified by the works management, which could affect people and the environment outside the works. Thus, the off-site plan follows logically from the analysis that took place to provide the basis for the on-site plan. The two plans therefore complement each other. The off-site plan in detail should be based on those events which are most likely to occur, but other less likely events which would have very severe consequences but have a small probability of occurrence will be in this category, although there will be certain events which would have severe consequences should also be considered.

The roles of the various parties who may be involved in the implementation of an off-site plan are described below. The responsibility for the off-site plan will be with the local authority. Either way, the plan must identify an emergency co-ordinating officer who would take overall command of the off-site activities. As with the on-site plan, an emergency control centre will be required with which the emergency coordinating officer can operate.

An early decision will be required in many cases on the advice to be given to people living "within range" of the accident - in particular whether they should be evacuated or told to go indoors. In the latter case, the decision can regularly be reviewed in the event of an escalation of the incident. Consideration of evacuation may include the following factors :





- In the case of a major fire but without explosion risk for example from an oil storage tank, only houses close to the fire are likely to need evacuation, although a severe smoke hazard may require this to be reviewed periodically.
- If a fire is escalating and in turn threatening a store of hazardous material, it might be necessary to evacuate people nearby, but only if there is time; if insufficient time exists, people should be advised to stay indoors and shield themselves from the fire. This latter case particularly applies if the installation at risk could produce a fireball with very severe thermal radiation effects for example from gas storage.

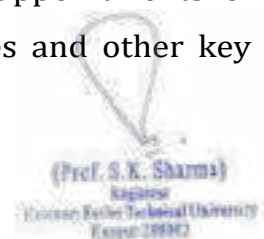
Although a plan should have sufficient flexibility built in to cover the consequences of the range of accidents identified for the on-site plan, it is suggested that it should cover in some detail the handling of the emergency to a particular distance from each major hazard works. This distance may be judged to be similar to the separation zone distance.

7.2 ASPECTS TO BE INCLUDED IN EPP

The following guidelines have been given on some of the aspects to be included in off-site emergency plans.

Organization

Details of command structure, warning systems, implementation procedures, emergency control centres, names and appointments of incident controller, site main controller, their deputies and other key personnel.





Communications

Identification of personnel involved, communication centre, call signs, network, lists of telephone numbers

Specialized Emergency Equipment

Details of availability and location of heavy lifting gear, bulldozers, specified fire-fighting equipment.

Specialized Knowledge

Details of specialist bodies, firms and people upon whom it may be necessary to call, e.g. those with specialized chemical knowledge, laboratories.

Voluntary Organizations

Details of organizers, telephone numbers, resources, etc.

Chemical Information

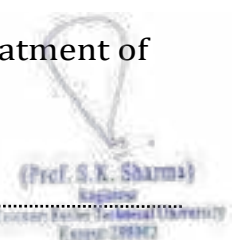
Details of the hazardous substances stored or processed on each site and a summary of the risks associated with them

Meteorological Information

Arrangements for obtaining details of weather conditions prevailing at the time and weather forecasts

Humanitarian Arrangements

Transport, evacuation centres, emergency feeding, treatment of injured, first aid, ambulances, temporary mortuaries





Public Information

Arrangements for dealing with the media press office, informing relatives, etc.

Assessment

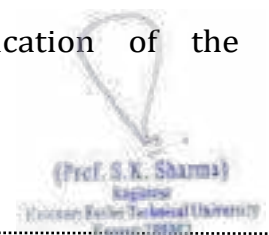
Arrangement for collecting information on the causes of the emergency, reviewing the efficiency and effectiveness of all aspects of the emergency plan

7.3 ROLE OF EMERGENCY COORDINATING OFFICER

The various emergency services will be coordinated by an emergency coordinating officer (ECO) who is likely to be a senior police officer but, depending on the circumstances, could be a senior fire officer. The ECO will liaise closely with the site main controller. Again depending on local arrangement, for very severe incidents with major or prolonged off-site consequences, the external control may pass to a senior local authority administrator or even an administrator appointed by the central or state government.

7.4 ROLE OF MAJOR HAZARD WORKS MANAGEMENT

Where the local authority has the organization to formulate the plan, the role of works management in off-site emergency planning will be to establish liaison with those preparing the plans and to provide information appropriate to such plans. This will include a description of possible on-site accidents with potential for off-site harm, together with their consequences and an indication of the relative likelihood of the accidents.





Advice should be provided by works managements to all the outside organizations which may become involved in handling the emergency off site and which will need previously to have familiarized themselves with some of the technical aspects of the works activities, such as emergency services, medical departments and also water authorities, if water contamination could be a consequence of an accident.

7.5 ROLE OF LOCAL AUTHORITY

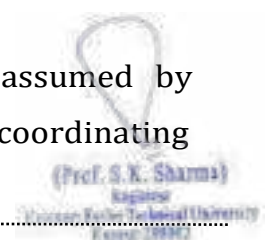
In many countries the duty to prepare the off-site plan lies with local authorities. They may have appointed an emergency planning officer (EPO) to carry out this duty as part of the EPO's role in preparing for a whole range of different emergencies within the local authority area. the EPO will need to liaise with the works to obtain the information to provide the basis for the plan. This liaison will need to be maintained to ensure that the plan is continually kept up to date.

It will be the responsibility of the EPO to ensure that all those organizations which will be involved off-site in handling the emergency know about their role and are able to accept it by having, for example, sufficient staff and appropriate equipment to cover their particular responsibilities.

Rehearsals for off-site plans are important for the same reason as on-site plans and will need to be organized by the EPO.

5.5.1 Role of Police

The overall control of an emergency is normally assumed by the police, with a senior officer designated as emergency coordinating





officer. Formal duties of the police during an emergency include protecting life and property and controlling traffic movements. Their functions include controlling by standards, evacuating the public, identifying the dead and dealing with casualties, and informing relatives of death or injury.

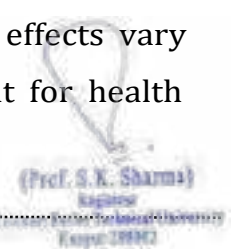
5.5.2 ROLE OF FIRE AUTHORITIES

The control of a fire is normally the responsibility of the senior fire brigade officer who would take over the handling of the fire from the site incident controller on arrival at the site. The senior fire brigade officer may also have a similar responsibility for other events, such as explosions and toxic releases. Fire authorities having major hazard works in their area should have familiarized themselves with the location on site of all stores of flammable materials, water and foam supply points, and fire fighting equipment. They may well have been involved in on-site emergency rehearsals both as participants and, on occasion, as observers of exercises involving only site personnel.

5.5.3 ROLE OF HEALTH AUTHORITIES

Health authorities, including doctors, surgeons, hospitals, ambulances, etc., have a vital part to play following a major accident, and they should form an integral part of any emergency plan.

For major fires, injuries will be the result of the effects of thermal radiation to a varying degree, and the knowledge and experience to handle this in all but extreme cases may be generally available in most hospitals. For major toxic releases, the effects vary according to the chemical in question, and it is important for health





authorities who might be involved in dealing with the aftermath of a toxic release to be familiar with the treatment appropriate to such causalities.

Major off-site incidents are likely to require medical equipment and facilities to those available locally, and a medical "mutual aid" scheme should exist to enable the assistance of neighboring authorities to be obtained in the event of an emergency.

5.5.4 ROLE OF SAFETY AUTHORITIES

Local authorities likely want to satisfy themselves that the university responsible for producing the off-site plan has made adequate arrangements of handling emergencies of all types, including major emergencies. He may wish to see well-documented procedure and evidence of exercises undertaken to test the plan.

In the event of an accident, local arrangements regarding the role of the designated head will apply. These may vary from keeping a watching brief to a close involvement in advising on operations. In cases where toxic gases may have been released, the university authorities may be the only external agency with equipment and resources to carry out tests.

In the aftermath, the designated head may wish to ensure that the affected areas are rehabilitated safely. In addition, they may require items of plant and equipment essential for any subsequent investigation to be impounded for expert analysis, and may also want to interview witnesses as soon as practicable.





7.6 EMERGENCY EXERCISES AND REHEARSALS

Extensive experience for such universities with on-site emergency planning has proved the need and value of rehearsals of emergency procedures. The responsible persons for producing the off-site plan should test its arrangement in conjunction with on-site exercises. Table-top rehearsals have proved extremely useful in such cases, although they need close control to maintain a sufficient element of realism in the exercises.

An essential component of any trial is that of testing fully the various communication links necessary to gather the information needed for overall coordination, e.g. between works and emergency services, and between the works emergency control centre and the incident.

Management of major hazard works are well placed to advise on the setting up of rehearsals, and particularly to advise on the scope for an escalation in the degree of emergency.

7.7 STRUCTURE AND ELEMENTS OF EMERGENCY RESPONSE SYSTEMS

While differing in particulars, depending on the scope of the emergency, all response systems should include the following elements.

5.7.1 THE ALERT SYSTEM

This requires the establishment of suitable alarm systems, and a standard procedure for transmitting the information on the occurrence of an accident to the appropriate focal point. The focal





point may move up in the hierarchy, depending on the level of the accident.

5.7.2 EVALUATION OF SITUATION, CLASSIFICATION OF THE ACCIDENT

Basic information must be provided enabling preliminary classification of the accident, probable consequence and actions required. This initial appraisal would normally be conducted by the person named as the focal point. At the same time, detailed data and information related to the accident are collected and internal, as well as external, expertise may be requested.

5.7.3 DECISION AND ALERTING OF THE EMERGENCY RESPONSE SYSTEM

In most accidents, time is a most important factor in cases of explosions, sudden release of dangerous quantities of toxic chemicals into the environment and decisions must often be based only on preliminary data and insufficient expertise. Decisions should be verified and corrected as soon as possible.

5.7.4 PROVISION OF INFORMATION

Adequate flow of information must be assured to all relevant parties to ensure effective and fast response to the accident. The information should be addressed to the following:

- ★ University management, and locals in vicinity





- ★ The focal point of a higher level
- ★ Fire brigade
- ★ Police
- ★ Public health services, hospitals
- ★ Construction firms
- ★ Public
- ★ Others

5.7.5 PROVISION OF EXTERNAL HELP

In many instances, accidents involving the release of toxic chemicals into the environment cannot be effectively contained nor can the adverse impacts be minimized without some external help or advice. Some examples of the help or advice required include access to relevant information, particularly to toxicological data, allowing classification of the accident and the provision of qualified advice concerning protective equipment and remedial measures necessary.

5.7.6 DECISION ON IMPLEMENTATION OF PROTECTIVE REMEDIAL MEASURES

Even at an early stage following the accident, the provision of effective repetitive measures is of high priority. Simultaneously, possible future remedial or rehabilitative activities should be considered. This approach may prove itself not only to be more economical, but it may also prevent a number of problems in the future. The following actions may be required :

(Prof. S. K. Sharma)
Signature





- ★ Evacuation of the university premises
- ★ Evacuation of the population from the affected area
- ★ Organization of receiving areas for the evacuated populations with adequate supplies and facilities
- ★ Removal of the material spilled in the accident
- ★ In the event of a cut in water, gas or power supply, the provision of substitute safe and reliable supplies
- ★ Changes of routes, for private and public transportation
- ★ Provision of adequate food supply for emergency workers and evacuated people.

5.7.7 CONTINUOUS MONITORING OF THE POST-ACCIDENT SITUATION, ADOPTION OF RELEVANT DECISION AND MEASURES

Monitoring and evaluation the public and environmental health impacts of the accident, as well as the consequences of changes with time, on the whole affected area, are essential for effective handling of the emergency. The measures adopted initially must be modified as circumstances change in the specific situation.

5.7.8 MAINTENANCE OF COMMUNICATION LINKS

There are a number of parties to whom regular information of the development of the situation must be provided. They include, for instance, governmental authority at the appropriate level, health services, and the general public (preferably through a single



information officer to the mass media to ensure internally consistent reporting).

- Highly qualified assistance, which can provide information based on previous experience, and under the pressure prevailing at the time, and can estimate the probable consequences of the accident under the prevailing conditions.
- Services of qualified, reliable and tested, well-equipped laboratories, to perform the necessary analyses and tests
Provision of skilled personnel to deal effectively with the emergency
- Provision of such material and equipment as may be necessary to provide adequate protection and remedial measures

In view of the serious consequences of a major emergency involving dangerous chemicals, a high degree of accuracy and reliability has to be assured in relation to the different classes of information that have to be supplied. The quality of data in relation to the detection and judgment on the seriousness of the emergency is especially important. Effective information systems should provide ready access to information tailored to the explicit needs to their users. In general, however, the existing data and information systems do not contain all the information needed in emergency conditions. Extension and improvement of the information systems is urgently needed.

5.7.9 PREPARATION OF PLANS FOR REHABILITATION

Once the emergency is under control and principal causes and consequences clearly understood, a comprehensive plan should be





prepared to ensure fast and effective restoration of both the environmental quality and the socio-economic activities in the affected area.

5.7.10 POST-ACCIDENT ANALYSIS AND EVALUATION OF RESPONSE ACTIVITIES

When the emergency is over, it is desirable to carry out a detailed analysis of the causes of the accident, evaluate the influence of the various factors involved and propose methods to eliminate or minimize them for the future. At the same time, the adequacy of the contingency plan should be evaluated. Due attention should be paid to the efficiency of the emergency response system as well as the adequacy and timing of the various components of the plan.

5.7.11 PREPARATION OF THE FINAL REPORT ON THE ACCIDENT

The final report on the accident should provide a full picture of the accident, its causes, development, consequences, process of handling of the emergency, implementation of the emergency response system and the results obtained. The shortcomings of the contingency plan, failures experienced and successes achieved in preventive, protective and rehabilitative measures should also be recorded. The main objective of the final report is to record all experience and knowledge gained from the event to provide the basis for further improvement of the contingency plan as well as the development and practical application of emergency response systems.





8. ENVIRONMENTAL AUDIT - THE ISSUES, FOCUS & METHODOLOGY

INTRODUCTION

In today's world of keen demand on financial and economic competitiveness through industrialization and simultaneous strong growing social awareness towards risks and environmental degradation associated with industrialization, the industry is under serious stress as to how to tackle it. Therefore, it is in the interest of every industry to have some formalized procedure, to provide their management, the vital knowledge of its compliance with environmental laws and procedures towards the environmental protection and their social acceptability. The formalized procedure to achieve the aforementioned objective is now popularly known as "Environmental Audit".

The concept of environmental audit is not some thing unheard of, rather it came into operation during the early 1970's in USA and industrialized European countries. However, it had a number of different approaches and names, like environmental reviews, environmental quality controls etc.

In view of the experience of development nations where such procedure have benefited the industries and helped in reducing the environmental degradation there, the developing countries have also started taking initiatives in adopting such methodologies.

DEFINING ENVIRONMENTAL AUDIT

There is no single universally accepted definition of environmental audit, perhaps, because of absence of standard procedure and methodology to conduct this kind of study. However,





the definition accepted by Internal Chamber of Commerce (ICC) is comprehensive and is as follows :

"Environmental Audit" is a management tool comprising a systematic documented, periodic and objectives evaluation of how well organizations, management systems and equipment are performing with the aim of :-

- 1- Facilitating management control on environmental practices.
- 2- Assessing compliance with company policies, including meeting regulatory requirements.

Environmental audit, therefore, has two basic components :

- a) Management Audit on Environmental philosophy of the organization.
- b) Technical Audit of the plant, equipment, facilities and operating practices compliance.

Environmental Audit differs from Environmental Impact Assessment (EIA), in that, the latter is predicative concept, carried out during the planning phase before an operation starts, while the audit is systematic examination of performance during the operational phase of industrial activity, including verification of adequacy of the suggested Environmental Management Plan (EMP) generated during EIA phase.

WHY AUDIT

As the definition of environmental audit suggests, it is required to be carried out by the desire of the company's management either on regulatory pressure or by its own consciousness / anxiety to have an assurance that the company's environmental management phase is adequately and satisfactorily operating. Thus prima facie the audit

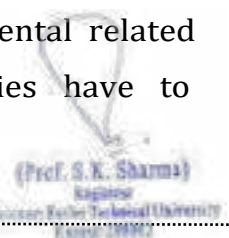


programme provides assurance to the company's managements the conformance to the enforced regulatory requirements, the consistency and adequacy of its environmental protection and pollution control systems and effectiveness of information reporting procedures.

BENEFITS OF AUDIT

The benefits of environmental audit to the pursuing industry are as broad as the audit objectives. As an example, a typical audit programme objective could be related to verification for the compliance status of individual facilities only or could be more comprehensive and define the changes necessary to reduce the wastage in production process itself.

The benefit of this study however would not end with just the identification and documentation of compliance status but will result in increased environmental effectiveness through improved compliance record, reduced occupational hazards, fewer legal actions, timely corrective actions for correction of faulty operating equipment / instruments / systems. The benefits influenced by audit are generally quantifiable, tangible and real. The reduced legal actions brought against company and / or individuals, reduced fines / penalties, reduced accidents, reduced incidences of environmental hazards, improved workers health, increase in worker productivity, reduced insurance rate etc., to list only a few. The intangible benefits would include better reputation, favorable publicity, improved relations with regulatory authorities, increased job satisfaction for workers, increased involvement in day to day environmental related activities and greater commitments etc. thus industries have to





realise that a strong environmental performance can help both within the company and outside the company.

AUDIT AS A PART OF ENVIRONMENTAL MANAGEMENT PLAN (EMP)

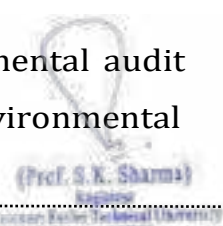
From the benefits an environmental audit brings to the industry, it is amply clear that audit should not be perceived as just a regulatory requirement, rather it is to the company's own advantage to include auditing in its Environmental Management Plan (EMP). Environmental Management Plan is an overall framework, involving well defined group of personnel assignment with specific responsibilities to develop, installed and monitor environment related plans for the company.

As any other management system, EMP also involves planning, organising, guiding, directing, communicating and finally controlling and reviewing to achieve the goals for which this management system is devised. The audit evidently falls in the controlling and reviewing function of EMP, because this function involves measuring results, comparing performances, diagnosing problems, taking corrective action based on the feedback and finally improving the system.

Although auditing may appear small part of EMP yet it is perhaps the most significant part of EMP. It has direct influence on the other functions of EMP and all other functions have to reviewed / redesigned based on audit recommendations.

FORM V FOR ENVIRONMENT AUDIT REPORT

It has been stated in the beginning that Environmental audit has a number of benefits. This, besides improving the Environmental





Management of an organization, also increases the organizations' profitability in tangible as well as intangible terms. India is one of the developing countries, working towards a high economic growth rate by taking certain steps. Most important of these steps would call for further rapid industrialization.


The Government of India has notified the requirement for carrying out Environment Audit for all the operating industries vide their Gazette Notification No. 120 dated March 13, 1992. This is an amendment under the Environment Protection Act 1986. To help the industry in formulating the requisite information regarding its raw material usage, product profile, production process, waste discharge, pollution control system etc. a prescribed proforma is enclosed with the notification. The proforma has been prepared primarily to cover only the regulatory compliance requirements on the basis on data reported and presented by the industry.

The environmental statement is to be submitted in Form V, which has nine parts, namely Part A, B, C, D, E, F, G, H & I.

Part A contains the name and address of the owner and the date of the last environmental audit report submitted.

Part B pertains to the consumption of waste and raw materials. Water consumption is to be given separately for process, cooling, and domestic uses, in m^3 / day and also in terms of water consumption / unit of product, for the various products. Similarly information on raw materials consumption, product-wise per unit of output is to be provided.

Part C relates to the quantities of hazardous wastes generated, separately from the process and from pollution control facilities.


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Part D deals with the quantities of solid wastes generated from the process as well as pollution control facilities.

Part E deals with the quantities of solid wastes generated from the process as well as pollution control facilities, and seeks to know also about the quantities recycled or reutilised.

All the Parts from B to E require comparisons of the current years performance with that of the previous year.

Part F seeks information regarding characteristics (in terms of concentration and quantum) of Hazardous and solid wastes and about the practice adopted for the disposal of both these categories of wastes.

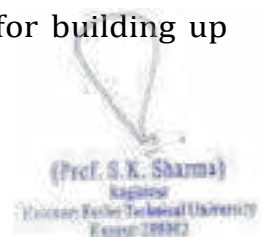
Part G calls for information on the impact of pollution measures on the conservation of natural resources and consequently on the cost of production.

The industry is required to indicate in Part H, its future proposals for investment in environmental protection, including abatement of pollution.

In the last Part, I, any other particulars, in respect of environmental protection and abatement of pollution may be given.

CONCLUSIONS

Taking advantage of the requirements of regulatory bodies the industry can take concrete steps now, to derive full benefits of Environmental Audit to become Environmental Friendly and yet more competitive. Environmental Audit, therefore, is not a restrictive requirement, but indeed a very useful and potent tool for building up the competitiveness in the industry.





LEGAL PROVISIONS

Ministry of Environment and Forests, Noti. No. G.S.R. 945 (E), dated February 12, 1992, published in the Gazette of India Extra. Part II, Section 3 (i), dated 12 February, 1992, p.2 (No. Q-14011(1) / 90 - CPA) :-

In exercise of the powers conferred by sections 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following rules further to amend the Environment (Protection) Rules, 1986, namely :-

- [1] 1. These rules may be called the Environment (Protection) (Amendment) Rules, 1992.
2. They shall come into force on the date of their publication in the Official Gazette.

[2] In Rule 3 of the environment (protection) Rules, 1986, after sub rule

(5) The following sub rules will be added, namely :-

(6) Notwithstanding anything contained in subrule (3), an industry operation process which commenced production on or before 16th May, 1981 and has shown adequate proof of a least commencement of physical work for establishment of facilities of meeting the specified standards with in a time bound programme, to the satisfaction of the concerned state pollution control board, shall comply with such standards latest by the 31st day December, 1993.

(7) Notwithstanding anything contained in Sub-rule (3) or subrule (6) industry, operation of process which has commenced production after the 16th day of may, 1991 but

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Signature
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JES, Kanpur



before the 31st day of December, 1991 and has shown adequate proof of a least commencement of physical work of establishment of facilities to meet the specified standards with in a time bound programme, to the satisfaction of the concerned state pollution control Board, shall comply with such standards latest by the 31st day of December, 1992.

Ministry of Environment and Forests, Noti. No. G.S.R. 329 (e) dated March 13, 1992, published in the Gazette of India, Extra., Part II, Section 3(i), deed 13th March 1992, Sl. No. 120, pp. 3-4 (F. No. q. 15015/1/90-CPA).

In exercise of the powers conferred by Sections 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following rules further to amend the Environment (Protection) Rules, 1986, namely :-

- [1] (i) These rules may be called the Environment (Protection) (Second Amendment) Rules, 1992.
- (ii) They shall come into force on the date of their publication in the Official Gazette.
- [2] In the environment (protection) Rules, 1986, (a) after rule 13, the following rule 14 shall be inserted, namely :-

Submission of Environment Audit Report :-

Every person carrying on an industry, operation or process requiring consent under section 25 of the water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) or under Section 21 of the Air (Prevention and Control of Pollution) act, 1981, (14 of 1981) or both authorization under the Hazardous wastes (Management and Handling) Rules, 1989, issued under the Environment (Protection)

(Prof. S. K. Sharma)



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Kanpur
1992
JES, Kanpur



Act, 1986 (29 of 1986) shall submit an environmental audit report for the financial year ending the 31st March in form V to the concerned state pollution control board on or before the 15th day of May every year, beginning, 1993.

GOVERNMENT OF INDIA

MINISTRY OF ENVIRONMENT AND FOREST

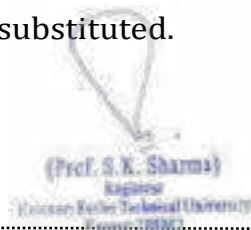
New Delhi : the 28th April, 1994

G.S.R. 329 (E), In exercise of the power conferred by Sections 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes

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the following rules further to amend the environment (Protection) Rules, 1986, namely :-

- [1] (i) These rules may be called the Environment (Protection) Amendment Rules, 1993
- (ii) They shall come into force on the date of their publications in the Official Gazette.
- [2] In the Environment (Protection) Rules, 1986,
 - (a) In rule 14,
 - (i) For the word audit report whenever they occur the word "statement" shall substituted.
 - (ii) For the figure letters and word "15th day of May" the word the "30th day of September" shall be substituted.





PICTOGRAPHICAL VIEW OF UNIVERSITY



Main Gate



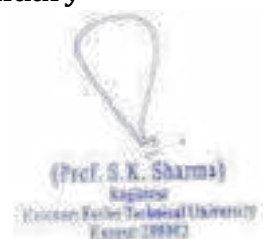
Main Building



Green Belt East Campus



Green Belt East Campus outside plant boundary





Green Belt West Campus



Garden Area West Campus



RWH Pit West Campus



Preparing Ground for New Garden Area West Campus



OHT East Campus



OHT West Campus



Main Gate West Campus Security



Security Check East Campus



Facilities West Campus



First Aid Centre East Campus



Temple East Campus





Trolley mounted emergency lights



Fire Fighting Water Tank West Campus



Static Water Tank West Campus



Genset with acoustic Enclosure West Campus



Cafeteria East Campus



Guest House East Campus

(Prof. S.K. Sharma)
Assistant
Harcourt Butler Technical University
Kanpur-208002





RWH Pits East Campus



Dustbins East Campus



COVID Awareness

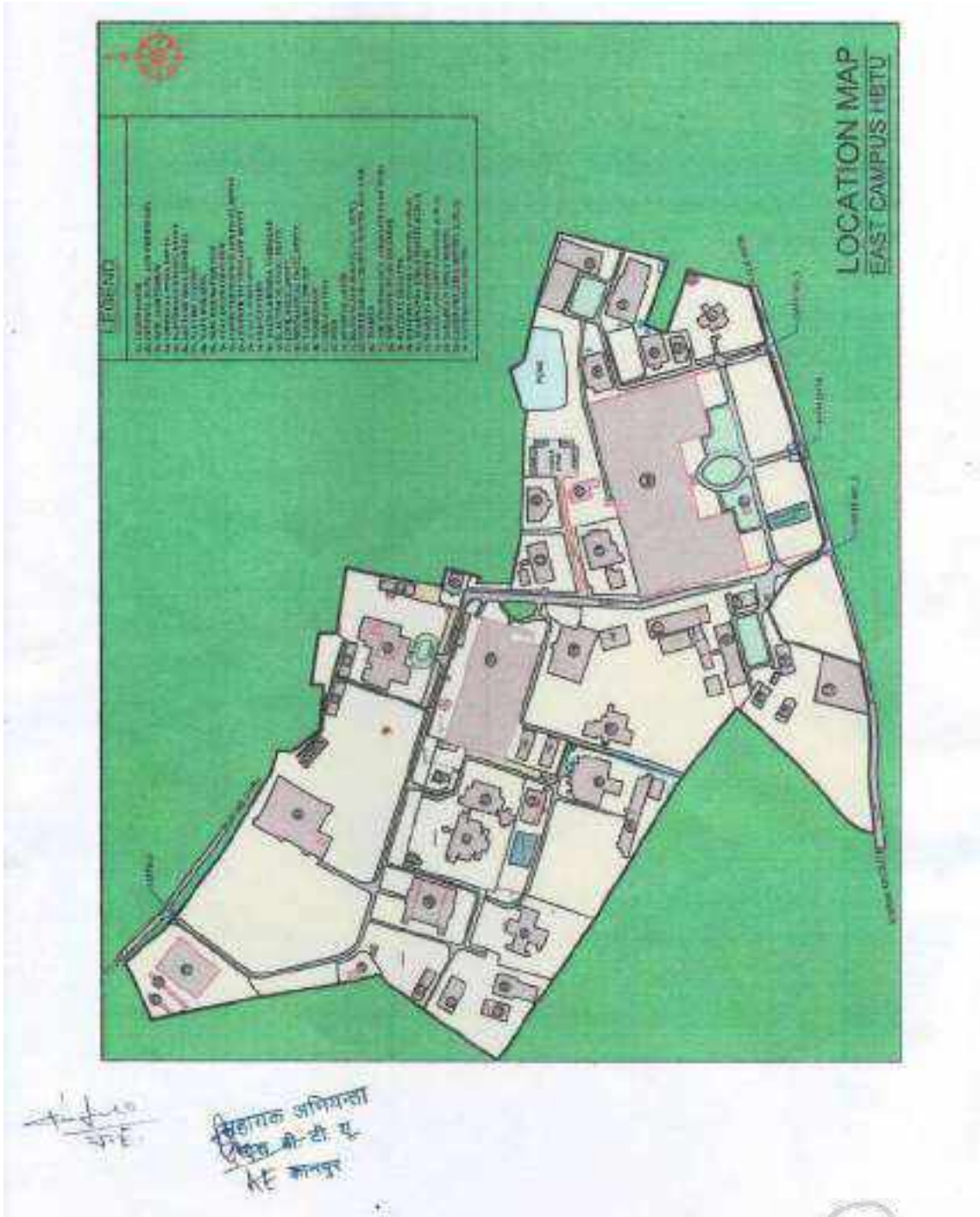


COVID Help Desk





SITE MAP OF CAMPUS



Location map of East Campus

Type text here
 (Prof. S. K. Sharma)
 Kanpur
 Harcourt Butler Technical University
 Kanpur-208002





Location map of West Campus





ANNEXURE: TEST REPORTS





(A GOVERNMENT APPROVED LAB)

(An ISO 9001:2015, 14001:2015 and 45001-2018 Certified Company)

Plot No. 1/32, South Side G.T. Road Industrial Area, Ghaziabad (U.P.) - 201001

email : etslab2012@gmail.com | Website : www.etslab.in | Ph.: 9911516076, 9811736063

TEST REPORT

TEST REPORT NO.: ETS/1238/07/2022 URL NO. TC677122000001235F DATE OF REPORT: 26.07.2022

WATER SAMPLE ANALYSIS REPORT

Name And Address of Customer : M/s, HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002

Date of Sample Received : 20.07.2022

Analysis Start Date : 21.07.2022

Analysis End Date : 25.07.2022

Sample ID No : 1235

Sampling Done By : ETS STAFF

Sampling Description : GROUND WATER

Sampling Location : BOREWELL WATER-I (EAST CAMPUS)

Sampling Method : IS 3025 (Part-1)

Sample Quantity : 2.0+0.5 Ltr

Packing Condition : SEALED

Packed In : P.V.C. AND GLASS BOTTLE



S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)		Test Method
				Desirable	Permissible	
PHYSICAL & CHEMICAL PARAMETERS:						
1	Colour	Hazen	<5.0	5	15	APHA 2120-B
2	Odour	---	Agreeable	Agreeable	Agreeable	APHA 2150-B
3	Taste	---	Agreeable	Agreeable	Agreeable	APHA 2160-C
4	Turbidity	NTU	<1	1	5	APHA 2130-B
5	pH	---	7.84	6.5 - 8.5	No Relaxation	APHA 4500-H+
6	Total Dissolved Solids.(TDS)	mg/L	272.0	500	2000	APHA 2540-C
7	Total Alkalinity.(CaCO ₃)	mg/L	143.0	200	600	APHA 2320-B
8	Total Hardness.(CaCO ₃)	mg/L	187.0	200	600	APHA 2340-C
9	Calcium.(Ca)	mg/L	38.0	75	200	APHA 3500.(Ca)-B
10	Magnesium.(Mg)	mg/L	22.4	30	100	APHA 3500.(Mg)-B
11	Chloride.(Cl)	mg/L	44.30	250	1000	APHA 4500.(Cl ⁻)-B
12	Sulphate.(SO ₄)	mg/L	28.40	200	400	APHA 4500.(SO ₄)-E
13	Nitrate.(NO ₃)	mg/L	8.50	45	No Relaxation	APHA 4500.(NO ₃)-B
14	Fluoride.(F)	mg/L	0.18	1	1.5	APHA 4500.(F ⁻)-D
15	Anionic Detergent.(MBAS)	mg/L	<1.0	0.2	1	APHA 5540-C
16	Mineral Oil	mg/L	<1.0	1.0	No Relaxation	IS 3025 (Part-39)
17	Free Chlorine (Residual)	mg/L	<0.1	0.2	1	APHA 4500.(Cl ⁻)-B

For Enviro-Tech Services

 AUTHORIZED SIGNATORY
 Lab in-charge

CHECKED BY
 SHRADDHA GUPTA

Page 1 of 3

Format No ETS/LAB/TR-08, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

Note:-

1. Test reports without ETS LAB HOLOGRAM are not issued by our laboratory.
2. This test report shall not be used in any advertising media or as evidence in the court of Law without prior written permission of the laboratory.
3. The sample shall be destroyed after 15 days & Biological / Perishable sample shall be destroyed immediately after issue of test report.
4. The results indicated only refer to the tested samples and listed applicable parameters.
5. No complaint will be entertained if received after 7 days of issue of test report.
6. Our liability is limited to invoice value only.

(Prof. S.K. Sharma)
 Registrar
 Harcourt Butler Technical University
 Kanpur-208002

TEST REPORT

TEST REPORT NO. ETS/1235/97/2022 URL NO TC877122000001235F DATE OF REPORT 25.07.2022

WATER SAMPLE ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)		Test Method
				Desirable	Permissible	
HEAVY METALS:-						
18	Arsenic (As)	mg/L	<0.01	0.01	No Relaxation	APHA 3120B
19	Lead,(Pb)	mg/L	<0.01	0.01	No Relaxation	APHA-3120B
20	Zinc as Zn	mg/L	0.12	5.0	15	APHA-3120B
21	Boron,(B)	mg/L	0.18	0.5	2.4	APHA 4500.(B)
22	Mercury ,(Hg)	ug/L	<0.1	0.001	No Relaxation	US EPA Method 200.7 1994
23	Cadmium,(Cd)	mg/L	<0.01	0.003	No Relaxation	APHA 3120B
24	Copper,(Cu)	mg/L	<0.01	0.05	1.5	APHA 3120B
25	Iron,(Fe)	mg/L	<0.05	1.0	No Relaxation	APHA-3120B
26	Manganese,(Mn)	mg/L	<0.01	0.1	0.3	APHA-3120B
27	Phenolic Compound,(C ₆ H ₅ OH)	mg/L	<0.01	0.001	0.002	APHA 5530-C



(Prof. S.K. Sharma)
Engineer
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Kirti Vihar, Delhi-110012



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SHRAADHA GUPTA
ETS-LAB

Page 2 of 3

Format No ETS/LAB/TR-09, Issue No. 05, Date 01.04.2019; Amd. No. 04 Date 01.04.2019

For Enviro Tech Services

Engineer
GGS Indraprastha Engineering College
Kirti Vihar, Delhi-110012
AUTHORIZED SIGNATORY



(Prof. S.K. Sharma)
Engineer
GGS Indraprastha Engineering College
Kirti Vihar, Delhi-110012

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TEST REPORT

TEST REPORT NO: ETS/1234567/2022

DATE OF REPORT: 25-07-2022

WATER SAMPLE ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)	Test Method
MICROBIOLOGICAL PARAMETER;					
28	Escherichia coli	MPN/100mL	Absent	Shall Not Be Detectable	IS:1622:2019
29	Total Coliform	MPN/100mL	Absent	Shall Not Be Detectable	IS:1622:2019

End of the report

(Prof. S.K. Sharma)

Professor

Environ. Technol. University
Kapurthala

(Prof. S.K. Sharma)

Professor

Environ. Technol. University
Kapurthala

Page 3 of 3



AUTHORIZED SIGNATORY

Format No ETS-LAB/TR-09, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

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Plot No. 1/32, South Side G.T. Road Industrial Area, Ghaziabad (U.P.) - 201001

email : etslab2012@gmail.com | Website : www.etslab.in | Ph.: 9911516076, 9811736063



TEST REPORT

TEST REPORT NO.: ETS/1236/07/2022 URLNO.TC877122000001236F DATE OF REPORT: 25.07.2022

WATER SAMPLE ANALYSIS REPORT

Name And Address of Customer : M/s, HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002

Date of Sample Received : 20.07.2022
Analysis Start Date : 21.07.2022
Analysis End Date : 25.07.2022
Sample ID No : 1236
Sampling Done By : ETS STAFF
Sampling Description : GROUND WATER
Sampling Location : BOREWELL WATER-II (WEST CAMPUS)
Sampling Method : IS 3025 (Part-1)
Sample Quantity : 2.0+0.5 Ltr
Packing Condition : SEALED
Packed In : P.V.C. AND GLASS BOTTLE



S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)		Test Method
				Desirable	Permissible	
PHYSICAL & CHEMICAL PARAMETERS:						
1	Colour	Hazen	<5.0	5	15	APHA 2120-B
2	Odour	...	Agreeable	Agreeable	Agreeable	APHA 2150-B
3	Taste	...	Agreeable	Agreeable	Agreeable	APHA 2160-C
4	Turbidity	NTU	<1	1	5	APHA 2130-B
5	pH	...	7.21	6.5 - 8.5	No Relaxation	APHA 4500-H+
6	Total Dissolved Solids (TDS)	mg/L	246.0	500	2000	APHA 2540-C
7	Total Alkalinity (CaCO ₃)	mg/L	128.0	200	600	APHA 2320-B
8	Total Hardness (CaCO ₃)	mg/L	168.0	200	600	APHA 2340-C
9	Calcium (Ca)	mg/L	30.6	75	200	APHA 3500:(Ca)-B
10	Magnesium (Mg)	mg/L	22.2	30	100	APHA 3500:(Mg)-B
11	Chloride (Cl)	mg/L	38.42	250	1000	APHA 4500:(Cl-) -B
12	Sulphate (SO ₄)	mg/L	26.34	200	400	APHA 4500 (SO ₄)-E
13	Nitrate (NO ₃)	mg/L	7.62	45	No Relaxation	APHA 4500 (NO ₃)-B
14	Fluoride (F)	mg/L	0.26	1	1.5	APHA 4500 (F-) -D
15	Anionic Detergent (MBAS)	mg/L	<1.0	0.2	1	APHA 5540-C
16	Mineral Oil	mg/L	<1.0	1.0	No Relaxation	IS 3025 (Part-39)
17	Free Chlorine (Residual)	mg/L	<0.1	0.2	1	APHA 4500:(Cl)-B



CHECKED BY

1. SHRADHA GUPTA AB HOLOGRAM are not issued by our laboratory.

2. This test report shall not be used for any other purpose than the one for which it is issued by the laboratory.

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(Prof. S.K. Sharma)
In-charge

For Enviro-Tech Services

[Signature]
Pudhvir Mittal
In-charge

AUTHORIZED SIGNATORY



ETS-LAB



ENVIRO-TECH SERVICES

An Analytical Laboratory

(A GOVERNMENT APPROVED LAB)

(An ISO 9001:2015, 14001:2015 and 45001-2018 Certified Company)

Plot No. 1/32, South Side G.T. Road Industrial Area, Ghaziabad (U.P.) - 201001

email : etslab2012@gmail.com | Website : www.etsiab.in | Ph.: 9911516076, 9811736063



ISO 9001/14001/45001

TEST REPORT

TEST REPORT NO.: ETS/123607/2022

URLNO.TC87712200001238F

DATE OF REPORT: 26.07.2022

WATER SAMPLE ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)		Test Method
				Desirable	Permissible	
HEAVY METALS:-						
18	Arsenic,(As)	mg/L	<0.01	0.01	No Relaxation	APHA 3120B
19	Lead,(Pb)	mg/L	<0.01	0.01	No Relaxation	APHA-3120B
20	Zinc as Zn	mg/L	0.17	5.0	15	APHA-3120B
21	Boron,(B)	mg/L	0.23	0.5	2.4	APHA 4500:(B)
22	Mercury,(Hg)	ug/L	<0.1	0.001	No Relaxation	US EPA Method 200.7 1994
23	Cadmium,(Cd)	mg/L	<0.01	0.003	No Relaxation	APHA 3120B
24	Copper,(Cu)	mg/L	<0.01	0.05	1.5	APHA 3120B
25	Iron,(Fe)	mg/L	<0.05	1.0	No Relaxation	APHA-3120B
26	Manganese,(Mn)	mg/L	<0.01	0.1	0.3	APHA-3120B
27	Phenolic Compound,(C ₆ H ₅ OH)	mg/L	<0.01	0.001	0.002	APHA 5530-C

(Prof. S.K. Sharma)

Signature
Director, Enviro Tech Services
Envtc 123607

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SHRADDHA GUPTA

Page 2 of 3

Envtc 123607

AUTHORIZED SIGNATORY

Formet No ETS/LAB/TR-08, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

(Prof. S.K. Sharma)

Signature
Director, Enviro Tech Services
Envtc 123607

Note:-

1. Test reports without ETS LAB HOLOGRAM are not issued by our laboratory.
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6. Our liability is limited to invoice value only.



TEST REPORT

TEST REPORT NO: ETS/1326/07/2022

DATE OF REPORT: 25.07.2022

WATER SAMPLE ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)	Test Method
MICROBIOLOGICAL PARAMETER;					
28	Escherichia coli	MPN/100mL	Absent	Shall Not Be Detectable	IS1622:2019
29	Total Coliform	MPN/100mL	Absent	Shall Not Be Detectable	IS1622:2019

End of the report


 (Prof. S.K. Sharma)
 Kapaneer
 Uttarakhand Technical University
 Dehra Dun-248002



Page 3 of 3

For Enviro-Tech Services


 (Prof. S.K. Sharma)
 Kapaneer
 Uttarakhand Technical University
 Dehra Dun-248002

AUTHORIZED SIGNATORY

Format No ETS-LAB/TR-09, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

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 (Prof. S.K. Sharma)
 Kapaneer
 Uttarakhand Technical University
 Dehra Dun-248002



TEST REPORT

TEST REPORT NO.: ETS/1227/07/2022 URLNO.TC877122000001227F DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

Name And Address of Customer : M/s. HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002



TC-8771

Date of Monitoring : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Duration Of Monitoring : 20.07.2022 To 21.07.2022
 Time Of Monitoring : 09.30 AM To 08.35 AM (CO&O₃ for 1.0 Hrs.)
 Sample ID No : 1227
 Sampling Done By : ETS STAFF
 Sampling Location : NEAR MAIN GATE (EAST CAMPUS)
 Sampling Method : ETS/STP/AIR-01
 Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL
 Weather Condition : CLEAR Ambient Temperature: 34.0 °C
 Wind Direction : E To W
 Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters (PM ₁₀)	µg/m ³	90.50	For 24 Hrs.=100	IS 5182 (Part-23)
2	Particulate Matters (PM _{2.5})	µg/m ³	48.10	For 24 Hrs.=60	IS 5182 (Part-24)
3	Sulphur Dioxide (SO ₂)	µg/m ³	12.65	For 24 Hrs.=80	IS: 5182 (Part-2)
4	Nitrogen Dioxide (NO ₂)	µg/m ³	25.20	For 24 Hrs.=80	IS: 5182 (Part-6)



For Enviro-Tech Services

(Signature)
AUTHORIZED SIGNATORY
Lab in-charge

(Prof. S. K. Sharma)
In-charge

Harcourt Butler Technical University
Kanpur-208002

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email : etslab2012@gmail.com | Website : www.etslab.in | Ph.: 9911516076, 9811736063



TEST REPORT

TEST REPORT NO.: ETS/1227/07/2022

DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide, (CO)	mg/m ³	0.75	For 8 Hrs =2 / For 1 Hrs =4	IS 5182 : Part 10

*****End of Test Report*****


 (Prof. S.K. Sharma)
 Registrar
 Indian Institute of Technology
 Kharagpur-721302



Page 2 of 2

For Enviro-Tech Services


 Anshu Mittal
 Lab in-charge
 AUTHORIZED SIGNATORY

Format No ETS/LAB/TR-01, Issue No: 05, Dtd: 01.04.2019, Amd. No: 04 Date 01.04.2019

Note:-

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TEST REPORT

TEST REPORT NO.: ETS/1228/07/2022 URLNO: TC877122000001228F DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT



Name And Address of Customer : M/s. HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002

Date of Monitoring : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Duration Of Monitoring : 20.07.2022 To 21.07.2022
 Time Of Monitoring : 09.25 AM To 08.30 AM (CO&O₂ for 1.0 Hrs.)
 Sample ID No : 1228
 Sampling Done By : ETS STAFF
 Sampling Location : NEAR AUDITORIUM (EAST CAMPUS)
 Sampling Method : ETS/STP/AIR-01
 Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL
 Weather Condition : CLEAR Ambient Temperature: 34.0 °C
 Wind Direction : E To W
 Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters.(PM ₁₀)	µg/m ³	55.10	For 24 Hrs.=100	IS-5182 (Part-23)
2	Particulate Matters.(PM _{2.5})	µg/m ³	28.90	For 24 Hrs.=60	IS 5182 (Part-24)
3	Sulphur Dioxide, (SO ₂)	µg/m ³	8.80	For 24 Hrs.=80	IS: 5182 (Part-2)
4	Nitrogen Dioxide,(NO ₂)	µg/m ³	20.50	For 24 Hrs.=80	IS: 5182 (Part-6)

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Format No ETSILAB/TR-01, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

(Prof. S.K. Sharma)
 Registrar
 Harcourt Butler Technical University
 Kanpur-208002

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email : etslab2012@gmail.com | Website : www.etslab.in | Ph.: 9911516076, 9811736063



TEST REPORT

TEST REPORT NO.: ETS1226/07/2022

DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide,(CO)	mg/m ³	0.60	For 8 Hrs =2 / For 1 Hrs =4	IS 5182 : Part 10

*****End of Test Report*****



(Prof. S.K. Sharma)
Engineer
University of Technical Education
Kapurthala

Page 2 of 2


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(Prof. S.K. Sharma)
Engineer
University of Technical Education
Kapurthala



TEST REPORT

TEST REPORT NO.: ETS/1229/07/2022 URLNO.TC877122000001229F DATE OF REPORT: 26.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

Name And Address of Customer : M/s, HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU) NAWABGANJ, DISTT. - KANPUR (U.P.)-206002



Date of Monitoring : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Duration Of Monitoring : 20.07.2022 To 21.07.2022
 Time Of Monitoring : 09.00 AM To 08.05 AM (CO&O₂ for 1.0 Hrs.)
 Sample ID No : 1229
 Sampling Done By : ETS STAFF
 Sampling Location : NEAR LAKE VIEW HOSTEL (EAST CAMPUS)
 Sampling Method : ETS/STP/AIR-01
 Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL
 Weather Condition : CLEAR Ambient Temperature: 34.0 °C
 Wind Direction : E To W
 Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters.(PM ₁₀)	µg/m ³	59.80	For 24 Hrs.=100	IS 5182 (Part-23)
2	Particulate Matters.(PM _{2.5})	µg/m ³	27.20	For 24 Hrs.=60	IS 5182 (Part-24)
3	Sulphur Dioxide, (SO ₂)	µg/m ³	9.50	For 24 Hrs.=80	IS: 5182 (Part-2)
4	Nitrogen Dioxide.(NO ₂)	µg/m ³	21.80	For 24 Hrs.=80	IS: 5182 (Part-6)



For Enviro-Tech Services

Pushkar Mittal
Lab in-charge
AUTHORIZED SIGNATORY

(Prof. S. K. Sharma)
Engineer
Harcourt Butler Technical University
Kanpur, U.P.

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TEST REPORT

TEST REPORT NO.: ETS/1229/07/2022

DATE OF REPORT 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide, (CO)	mg/m ³	0.32	For 8 Hrs-#2 / For 1 Hrs-#4	IS 5182 : Part 10

*****End of Test Report*****



(Prof. S. K. Sharma)
Rajiv Gandhi
University of Technology & Management
Kapurthala



Page 2 of 2

For Enviro-Tech Services

Anshu Mittal
AUTHORIZED SIGNATORY

Format No ETS/LAB/TR-01, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

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TEST REPORT

TEST REPORT NO: ETS/1230/07/2022 URLNO.TC87712200000123DF DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

Name And Address of Customer : M/s. HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU) NAWABGANJ, DISTT. - KANPUR (U.P.)-208002



Date of Monitoring : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Duration Of Monitoring : 20.07.2022 To 21.07.2022
 Time Of Monitoring : 09.30 AM To 08.35 AM (CO&O₂ for 1.0 Hrs.)
 Sample ID No : 1230
 Sampling Done By : ETS STAFF
 Sampling Location : NEAR MAIN GATE (WEST CAMPUS)
 Sampling Method : ETS/STP/AIR-01
 Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL
 Weather Condition : CLEAR Ambient Temperature: 34.0 °C
 Wind Direction : E To W
 Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters.(PM ₁₀)	µg/m ³	68.20	For 24 Hrs.=100	IS 5182 (Part-23)
2	Particulate Matters.(PM _{2.5})	µg/m ³	30.90	For 24 Hrs.=60	IS 5182 (Part-24)
3	Sulphur Dioxide. (SO ₂)	µg/m ³	8.95	For 24 Hrs.=80	IS: 5182 (Part-2)
4	Nitrogen Dioxide.(NO ₂)	µg/m ³	19.20	For 24 Hrs.=80	IS: 5182 (Part-6)



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SHRADDHA GUPTA

Page 1 of 2



ENVIRO-TECH SERVICES
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Formet No ETS/LAB/TR-01, Issue No. 05, Date 01.04.2019, Amend. No. 04 Date 01.04.2019



(Prof. S.K. Sharma)
Kanpur
Harcourt Butler Technical University
Kanpur-208002

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TEST REPORT

TEST REPORT NO.: ETS/1230/07/2022

DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide (CO)	mg/m ³	0.26	For 8 Hrs.*2 / For 1 Hrs.*4	IS 5182 : Part 10

*****End of Test Report*****

Page 2 of 2

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SHRADDHA GUPTA

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Formal No ETS/LAB/TR-01, Issue No. 08, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

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Dr. S. K. Sharma
Expert
Faculty Technical University
Kapurthala
Kapurthala
Kapurthala



TEST REPORT

TEST REPORT NO: ETS/1231/07/2022 URLNO.TC877122000001231F DATE OF REPORT 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT



Name And Address of Customer : M/s, HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU) NAWABGANJ, DISTT. - KANPUR (U.P.)-208002

Date of Monitoring : 20.07.2022

Analysis Start Date : 21.07.2022

Analysis End Date : 25.07.2022

Duration Of Monitoring : 20.07.2022 To 21.07.2022

Time Of Monitoring : 09.15 AM To 08.15 AM (CO&O₃ for 1.0 Hrs.)

Sample ID No : 1231

Sampling Done By : ETS STAFF

Sampling Location : NEAR HOSTEL AREA (WEST CAMPUS)

Sampling Method : ETS/STP/AIR-01

Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL

Weather Condition : CLEAR Ambient Temperature: 34.0 °C

Wind Direction : E To W

Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters.(PM ₁₀)	µg/m ³	53.40	For 24 Hrs.=100	IS 5182 (Part-23)
2	Particulate Matters.(PM _{2.5})	µg/m ³	25.70	For 24 Hrs.=60	IS 5182 (Part-24)
3	Sulphur Dioxide, (SO ₂)	µg/m ³	6.10	For 24 Hrs.=80	IS: 5182 (Part-2)
4	Nitrogen Dioxide.(NO ₂)	µg/m ³	18.50	For 24 Hrs.=80	IS: 5182 (Part-6)



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SHRADDHA GUPTA

Page 1 of 2

For Enviro-Tech Services



Pankar Mittal
Lab In-charge
AUTHORIZED SIGNATORY

Formal No ETS/LAB/TR-01, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019



(Prof. S.K. Sharma)
Engineer
Harcourt Butler Technical University
Kanpur 208002

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TEST REPORT

TEST REPORT NO.: ETS/1231/07/2022

DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide (CO)	mg/m ³	0.35	For 8 Hrs. >2 / For 1 Hrs. >4	IS 5182 : Part 10

*****End of Test Report*****


 (Prof. S.K. Sharma)
 Professor
 Kurukshetra Technical University
 Kurukshetra



Page 2 of 2


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Format No ETS/LAB/TR-01, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

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email : etslab2012@gmail.com | Website : www.etslab.in | Ph.: 9911516076, 9811736063



TEST REPORT

TEST REPORT NO. ETS/1232/07/2022 URLNO.TC877122000001232F DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

Name And Address of Customer : M/s, HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ. DISTT. - KANPUR (U.P.)-208002

TC-8771

Date of Monitoring : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Duration Of Monitoring : 20.07.2022 To 21.07.2022
 Time Of Monitoring : 09.30 AM To 08.40 AM (CO&O₃ for 1.0 Hrs.)
 Sample ID No : 1232
 Sampling Done By : ETS STAFF
 Sampling Location : NEAR STAFF QUARTER (WEST CAMPUS)
 Sampling Method : ETS/STP/AIR-01
 Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL
 Weather Condition : CLEAR Ambient Temperature: 34.0 °C
 Wind Direction : E To W
 Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters,(PM ₁₀)	µg/m ³	59.50	For 24 Hrs.=100	IS 5182 (Part-23)
2	Particulate Matters,(PM _{2.5})	µg/m ³	29.30	For 24 Hrs.=60	IS 5182 (Part-24)
3	Sulphur Dioxide,(SO ₂)	µg/m ³	9.20	For 24 Hrs.=80	IS: 5182 (Part-2)
4	Nitrogen Dioxide,(NO ₂)	µg/m ³	20.10	For 24 Hrs.=60	IS: 5182 (Part-6)

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SHRADDHA GUPTA

Page 1 of 2

For Enviro-Tech Services

 P. K. Mittal
 In-charge
 AUTHORIZED SIGNATORY

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5. No complaint will be entertained if received after 7 days of issue of test report.
6. Our liability is limited to invoice value only.

(Prof. S.K. Sharma)

 Professor
 Harcourt Butler Technical University
 Kanpur-208002



ENVIRO-TECH SERVICES

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(A GOVERNMENT APPROVED LAB)

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email : etslab2012@gmail.com | Website : www.etslab.in | Ph : 9911516076, 9811736063



TEST REPORT

TEST REPORT NO. ETS/1232/07/2022

DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide,(CO)	mg/m ³	0.30	For 8 Hrs.=2 / For 1 Hrs.=4	IS 5182 : Part 10

*****End of Test Report*****



(Prof. S.K. Sharma)
Professor
GGS Indraprastha University
Kirti Nagar

Page 2 of 2



CHECKED BY
SHRADDHA GUPTA

ENVIRO-TECH SERVICES

AUTHORIZED SIGNATORY

Format No ETS/LAB/TR-01, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

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TEST REPORT

TEST REPORT NO. ETS/1233/07/2022

URLNO:TC87712200001233F

DATE OF REPORT: 25.07.2022

WASTE WATER SAMPLE ANALYSIS REPORT

Name And Address of Customer : M/s. HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002

Date of Sampling : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Sample ID No : 1233
 Sampling Done By : ETS STAFF
 Sampling Description : WASTE WATER
 Sampling Location : FINAL OUTLET DRAIN FOR EAST CAMPUS
 Sampling Method : ETS/STP/WATER-02
 Sample Quantity : 2.0 Ltr.
 Packing Condition : SEALED
 Packed In : P.V.C. CANE



S. No.	Test Parameter	Unit	Result	Specification/Limit (As per G.S.R 422(E))	Test Method
1	pH		7.60	5.5 - 9.0	APHA 4500-H+
2	Total Suspended Solids,(TSS)	mg/L	47.0	100.0	APHA 2540-D
3	Total Dissolved Solids as TDS	mg/L	1015	-	APHA 2540-C
4	Oil & Grease, (O & G)	mg/L	4.6	10.0	APHA 5520-D
5	Biological Oxygen Demand (BOD ₅ 27°C)	mg/L	20.5	30.0	IS: 3025 (Part-44)
6	Chemical Oxygen Demand,(COD)	mg/L	110.0	250.0	APHA 5220-B

END OF THE REPORT



Page 1 of 1

For Enviro-Tech Services
(Signature)
Pushkar Mittal
AUTHORIZED SIGNATORY

Formal No ETS/LAB/TR-10, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

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(Signature)
(Prof. S.K. Sharma)
Harcourt Butler Technical University
Kanpur-208002



TEST REPORT NO. ETS/1234/07/2022

URLNO.TC877122000001234F

DATE OF REPORT. 25.07.2022

WASTE WATER SAMPLE ANALYSIS REPORT

Name And Address of Customer : M/s. HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
 NAWABGANJ, DISTT. - KANPUR (U.P.)-208002

Date of Sampling : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Sample ID No : 1234
 Sampling Done By : ETS STAFF
 Sampling Description : WASTE WATER
 Sampling Location : FINAL OUTLET DRAIN FOR WEST CAMPUS
 Sampling Method : ETS/STP/WATER-02
 Sample Quantity : 2.0 Ltr.
 Packing Condition : SEALED
 Packed In : P.V.C. CANE



S. No.	Test Parameter	Unit	Result	Specification/Limit (As per G.S.R 422(E))	Test Method
1	pH		7.80	5.5 - 9.0	APHA 4500-H+
2	Total Suspended Solids:(TSS)	mg/L	59.0	100.0	APHA 2540-D
3	Total Dissolved Solids as TDS	mg/L	1120.0	-	APHA 2540-C
4	Oil & Grease, (O & G)	mg/L	6.8	10.0	APHA 5520-D
5	Biological Oxygen Demand (BOD ₅ 27°C)	mg/L	29.4	30.0	IS: 3025 (Part-44)
6	Chemical Oxygen Demand,(COD)	mg/L	167.0	250.0	APHA 5220-B

END OF THE REPORT



Page 1 of 1

For Enviro-Tech Services

(Signature)
Anil Kumar

AUTHORIZED SIGNATORY

Format No ETS/LAB/TR-10, Issue No. 05, Date 01/04/2019, Amd. No. 04 Date 01/04/2019



(Prof. S.K. Sharma)

Registrar
Harcourt Butler Technical University

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हरकोर्ट बटलर प्राविधिक विश्वविद्यालय

नवाबगंज, कानपुर - 208002, उ.प्र., भारत

HARCOURT BUTLER TECHNICAL UNIVERSITY

NAWABGANJ, KANPUR - 208002, U.P., INDIA

[Formerly Harcourt Butler Technological Institute, Kanpur]

Phone : +91-0512-2534001-5, 2533812, website : <http://www.hbtu.ac.in>, Email : vc@hbtu.ac.in

100 YEARS
1921 - 2021

Green Audit



HARCOURT BUTLER TECHNICAL UNIVERSITY, KANPUR

CERTIFICATE

This is to certify that the Green Audit for Harcourt Butler Technical University, Located at Nawabganj, Kanpur has been conducted in Month of July 2022 to assess the Green practices as well as execution of existing Environmental Management System implemented in the University Campus for Water Management, Air Quality, Green Area Cover, Solid Waste Management and Knowledge of Environmental Legislation, Energy Consumption, Student Welfare Facilities Housekeeping Practices Existence of Carbon Foot Print and Green Wealth etc.

This specific Green Audit was carried out for the first time to assess the impact of major factors of Environmental practices and green initiatives inside the University. The corrective recommendations of this audit shall be helpful in much better planning for Green practices inside the University to make sustainable impact to increase the natural diversity.


(Prof. S. K. Sharma)
Signate
Harcourt Butler Technical University
Kanpur-208002



Dr Ashutosh Tandon
External Lead Auditor



JES, Kanpur

GREEN AUDIT REPORT



HARCOURT BUTLER TECHNICAL UNIVERSITY
KANPUR



Prepared by



JUPITER

ENVIRO-SAFE CONSULTANTS

33, DEENDAYAL NAGAR, KANPUR - 200002 : 7897555173



(Prof. D. N. Sharma)
Director
Harcourt Butler Technical University
Kanpur-200002

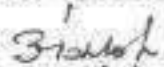


ACKNOWLEDGEMENT

M/s Jupiter Enviro-Safe Consultants Green Audit Team is pleased to convey thanks to the management of Harcourt Butler Technical University specially Honorable Prof. Shamsher Singh, Vice Chancellor, HBTU, Prof. Sunil Kumar, Prof. D. Parmar, Prof. J.K. Dwivedi, Er. Ashutosh Kumar Singh and Staff members of HBTU, Kanpur. We appreciate the cooperation extended to our team for completion of Green audit report successfully.

We extend our note of thanks to entire community including students club, Photography club and administration of HBTU for providing us the necessary inputs and data to carry out the vital exercise of Green Audit and field survey.

For **Jupiter Enviro-Safe Consultants**


(Dr A Tandon)


(Prof. S.K. Sharma)
Engineer
Harcourt Butler Technical University
Kanpur-208002





Harcourt Butler Technical University

Green Audit Team

Sr. No.	Name	Designation	Role
1.	Prof. Sunil Kumar 	Chairman Central Maintenance Committee and Dean Student Welfare	Coordinator
2.	Prof. D. Parmar 	HOD Department of Civil Engineering	Internal Auditor
3.	Mr J.K. Dwivedi Associate Prof. 	HOD Department of Electrical Engineering	Internal Auditor
4.	Er. Ashutosh Kumar Singh 	AE HBTU Central Maintenance	Internal Auditor
5.	Dr. Ashutosh Tandon 	Environmental Consultant	External Auditor
6.	Mr. Dheeraj Ganesh Mishra 	Environment Consultant	External Audit Team Member



(Prof. S. K. Sharma)

Registrar
Harcourt Butler Technical University
Kanpur-208002





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INTRODUCTION

Green Audit as undertaken is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of the University. It aims to analyze environmental practices within and outside of the university campus, which will have an impact on the surroundings & campus itself. Green audit is a valuable means for the University to determine how and where they are using the most energy or water or other resources; the University can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it can also be stated that this initiative if adopted may prove beneficial to the university. Thus it is imperative that for the university to evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is extremely important.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of generated CO₂ emissions from the campus. The National Assessment and Accreditation Council (NAAC) have made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through carbon footprint reduction measures.





ABOUT THE HARCOURT BUTLER TECHNOLOGICAL UNIVERSITY (HBTU), KANPUR

Since 1921 Harcourt Butler Technical University (Formerly HBTI Kanpur) has always been a paragon and a source of inspiration in the field of science and technology. It has maintained its conspicuous presence in the technical world. H.B.T.U has a history of realization, fulfilment of necessities and advancement in the field of science and technology. It is dedicated for the cause of rapid industrial development, creating a healthy environment for applied researches and above all to carve out men and women, having a truly rational and scientific demeanour. 'Attitude' is the watchword – taking care of which the personality of every Harcourtian is moulded. Its roots are as deep as its outlook. "Government Research Institute, Cawnpore" was established in 1920, which was renamed as "Government Technological Institute" in 1921. Finally in 1926 it got the name by which we know it today "Harcourt Butler Technological Institute". Now as per Act No. 11 of 2016 by the Government of Uttar Pradesh it becomes university, i.e., Harcourt Butler Technical University Kanpur.

The University is spread across two campuses, the east campus (77 acres) and the west campus (271 acres) situated about 3 km apart. HBTU, retained **M/S Jupiter Enviro-Safe Consultants**, Kanpur to conduct environmental audit for their both east & west campus.

Harcourt Butler Technical University Kanpur has been established in year 2016 by the Government of Uttar Pradesh with a view for making it a leading Residential University to become a Centre of Excellence with focus on Research and Development and Incubation in the field of Engineering, Technology, Basic & Applied Sciences,





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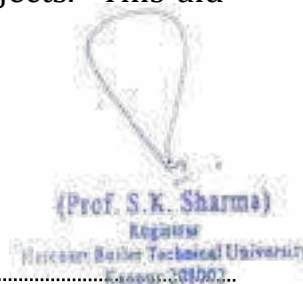
Humanities, Social Science & Management Architecture and other professional courses. HBTU aims to promote studies, research & innovation in engineering areas of higher education, to enhance skill development through continuing education programme and knowledge and to achieve excellence in higher Technical education.

On academic front, the University is running Four Schools with thirteen Undergraduate Programmes in Chemical Engineering, Civil Engineering, Computer Science & Engineering, Electrical Engineering, Electronics Engineering, Information Technology, Leather Technology , Mechanical Engineering, Biochemical Engineering, Food Technology , Oil Technology, Paint Technology and Plastic Technology along with M.C.A, full time & part time M.Tech. Programme in various disciplines and going to start full time Ph.D. programme in number of disciplines as part of Quality Improvement Programme of MHRD and TEQUP-II. In view of the emerging need of the time, the University is planning to start number of Programmes at Undergraduate and Post Graduate level in the near future.

The University provides a congenial environment for the holistic growth and all round development of the students such that they become globally acceptable personalities with communication skills, proper attitudes, aptitudes, problem solving capabilities and to work as a team.

HBTU Kanpur (Formerly HBTI) has received aid from the World Bank(Phases TEQIP-I , TEQIP-II) for various developmental projects. This aid will be spent for:

- Development of the Infrastructure.
- New Laboratory equipment.
- Maintenance and repair of old laboratory equipment.





- Funding for research and lectures attended by faculty in foreign Universities.
- Aim towards community development and overall growth.

The faculty members have contributed large numbers of research papers in Indian as well as International journals. Besides, many R&D Schemes sponsored by D.S.T, U.G.C, I.C.A.R, D.R.D.O.,U.P.C.S.T., C.S.I.R., D.A.E., I.C.M.R.,D.O.E. and Ministry of Civil supplies have been successfully completed. All these accomplishments definitely prove it to be a fecund ground for nurturing intellects.





GENERAL INFORMATION AND FACILITIES

Staff and Students Detail

Males	330
Females	20
Total	350

STUDENTS (INCLUDING ALL COURSES)

Boys	2400
Girls 20 % of total	600

Other Welfare Facilities at HBTU Kanpur

- 1) ATM-02 (EC & WC)
- 2) Free Wi-Fi -All Around the Campus
- 3) E-Learning Classrooms
- 4) Guest House with Modern Facilities -01
- 5) Cafeteria-02
- 6) Medical Centre-01
- 7) Ambulance-01
- 8) Auditorium-02
- 9) Gen. X Incubation Centre-01
- 10) E-Library-01
- 11) Parking-02 (EC & WC)
- 12) Community Hall -01
- 13) Multipurpose Hall-01
- 14) Post Office





Student Clubs

These sub-councils and student clubs existing- at HBTU Kanpur.

1. Literary Sub-council
2. Sports Sub-council
3. Cultural Sub-council
4. Photography Club
5. Yoga Club
6. Hobby Club
7. NSS

Annual Budget of the University (Approx.)

Rs 62 Crores for year 2021-22.





OBJECTIVES OF GREEN AUDIT

In recent time, the Green Audit of an institution has been becoming a paramount important for self-assessment of the institution which reflects the role of the institution in mitigating the existing environmental problems if any. The University has been continuously striving to keep the environment healthy since its inception. Therefore, the purpose of the present green 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 document the floral and faunal diversity of the University
- To identify General Climatic conditions of Kanpur where University is situated
- To Review the ambient air condition, water consumptions of the University.
- To Review the waste disposal system
- To estimate the Energy requirements of the University.
- To identify green initiatives in practice at present.
- Recommendations for further improvements





METHODOLOGY

The purpose of the green audit of HBTU, Kanpur was to ensure that the practices followed in the university campus are as such which keep the environment healthy. The methodology undertaken includes: collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

MISSION STATEMENT OF HBTU

1. Imparting Knowledge to develop analytical ability in science and technology to serve the industry and society at large.
2. Equip and enable students with conceptual, technical and managerial skills to transform the organization and society.
3. Inculcating entrepreneurial philosophy and innovative thinking to promote research, consultancy and institutional social responsibility.
4. Serving people, society and nation with utmost professionalism, values and ethics to make development sustainable and quality of life.





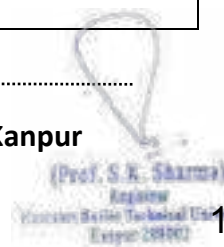
LAND USE ANALYSIS DETAILS OF HBTU, KANPUR

S.No.	Location	Area	In Sq.Mtr.
1	East Campus	77 Acre	3,11,607.94 Sqm.
2	West Campus	248 Acre	10,03,620.39 Sqm.

Being a largest technical university of Kanpur, HBTU has massive huge land bank. We have verified the land uses by the method of document review, site map and physical tour throughout the campus. Following measurements were found to assess the roads, covered area, built-up area and green area of east & west campus of the university.

Area break-up details

Sr.No.	Name of the Building	Area in Sq.Mtrs	Location
1.	Main Building	9048.40	East campus
2.	Computer Science and engineering	992.81	East Campus
3.	Mechanical Engineering	1422.60	East Campus
4.	Electrical and Electronics Engineering	1260.00	East Campus
5.	Civil Engineering	1594.65	East Campus
6.	Leather Technology	714.56	East Campus
7.	Work shop	6026.00	East Campus
8.	Library	2072.00	East Campus
9.	Drawing Hall	524.00	East campus
10	New Class Rooms in civil Engineering Department	250.00	East Campus
11.	New Environmental Engineering lab	120.00	East campus





12.	Incubation Lab Centre	412.74	East Campus
13	Chemical Engineering New Building	1507.00	East Campus
14.	Electronics Engineering New Building	2320.00	East Campus
15.	Gen X innovation Incubation and Entrepreneurship Cell	635.00	East Campus
16.	Extension of EE and Concrete labs	135.00	East campus
17	Administrative Office	1705.60	East Campus Main building
18	Class Rooms Total no. 63	5703.00	All Around East Campus
19.	Auditorium Old	825.00	East Campus
20.	Bank and Dispensary	420.00	East Campus
21.	Cafeteria Old	277.00	East Campus
22.	Cafeteria New	252.00	East Campus
23.	Guest House	1018.74	East Campus
24	Security Building	80.00	East Campus
25	Post Office	10.00	East Campus
26.	ATM	6.00	East Campus
27	Parking Old	5000.00	East Campus
28	Parking New	5000.00	East Campus
29	Community Center	150.00	West Campus
30	Indoor Court	200.00	East & West Campus
31	New Gymnasium	320.34	West Campus
32.	New Auditorium	595.00	West Campus
33	Multipurpose Hall	2321.25	West Campus





34.	Alaknanda Hostel	1275.00	East Campus
35.	Mandakini Hostel	980.00	East Campus
36.	Gangotri Hostel	920.00	East Campus
37.	Bhagirithi Hostel	1275.00	East Campus
38.	Kaveri Hostel	2000.00	East Campus
39.	Saraswati Hostel	1474.00	East Campus
40	Ramanujam Lake View Hostel	2627.00	East Campus
41	Sridharacharya Hostel	1352.93	East Campus
42	Abdul kalam Hostel	6250.00	West Campus
43.	Visvesaraya Hostel	5116.00	West Campus
44.	Raman Hostel	3602.00	West Campus
45.	Vishwakarma Hostel	2489.00	West Campus
46.	Ambedkar Hostel	3454.26	West Campus
47	Aryabhata Hostel	3454.26	West Campus
48.	Vivekanand Hostel	2014.00	West Campus
49.	Residence Buildings (Type-I,Type-II,Type- III,Type IV	4005.00 Total -73.00 Residences	East Campus
50.	Residence Buildings Type-I, Type II, Type III, Type IV Type V VC Residence	18514.00 Total-230.00 Residences	West Campus
51.	Roads 7km x3.75 mtr.Width	26250.00	East and West Campus





Total Built-up Area and Roads (East & West Campus)

S.no	Category	Area (in sq metre)	Location
1	Academic Buildings	29902.45	East Campus
2	Admin Buildings	2384.00	East Campus
3	Class Rooms	5703.00	East Campus
4	Residence	4005.00	East Campus
5	Residence	18514.00	West Campus
6	General Amenities	16577.38	East and West Campus
7	Boys Hostel	26380.00	West Campus
8	Boys/Girls Hostel	11854.00	East Campus
9	Roads (7KmLength;3.75 width)	26250.00	East and West Campus

Total Covered Area & Area of the roads = 141569.83 sqm

Total available open area for green belt development = Total Area of the Campus (E+W) – Total Covered Area & area of the roads (1315228.33 – 141569.83 sq.m)
= 1173658.5 sqm

The area reserved for green belt = 8,76,818 sqm

Above figures reveal that more than 2/3rd of the total land area is reserved for green belt. The university authorities are continuously incrementing their green cover in phases.





GEOGRAPHICAL LOCATION

HBTU, Kanpur is situated at the mid of the city near Nawabganj, Kanpur. The main heritage sites and tourist places near HBTU are Jageshwar Temple, C.S.A University, River Ganga, Kanpur Zoo(Allen Forest) etc. The co-ordinates of East Campus and West Campus are as following

East Campus Co-Ordinates:

Latitude 26.49.35°N

Longitude 80.30.74°E

West Campus Co-ordinates:

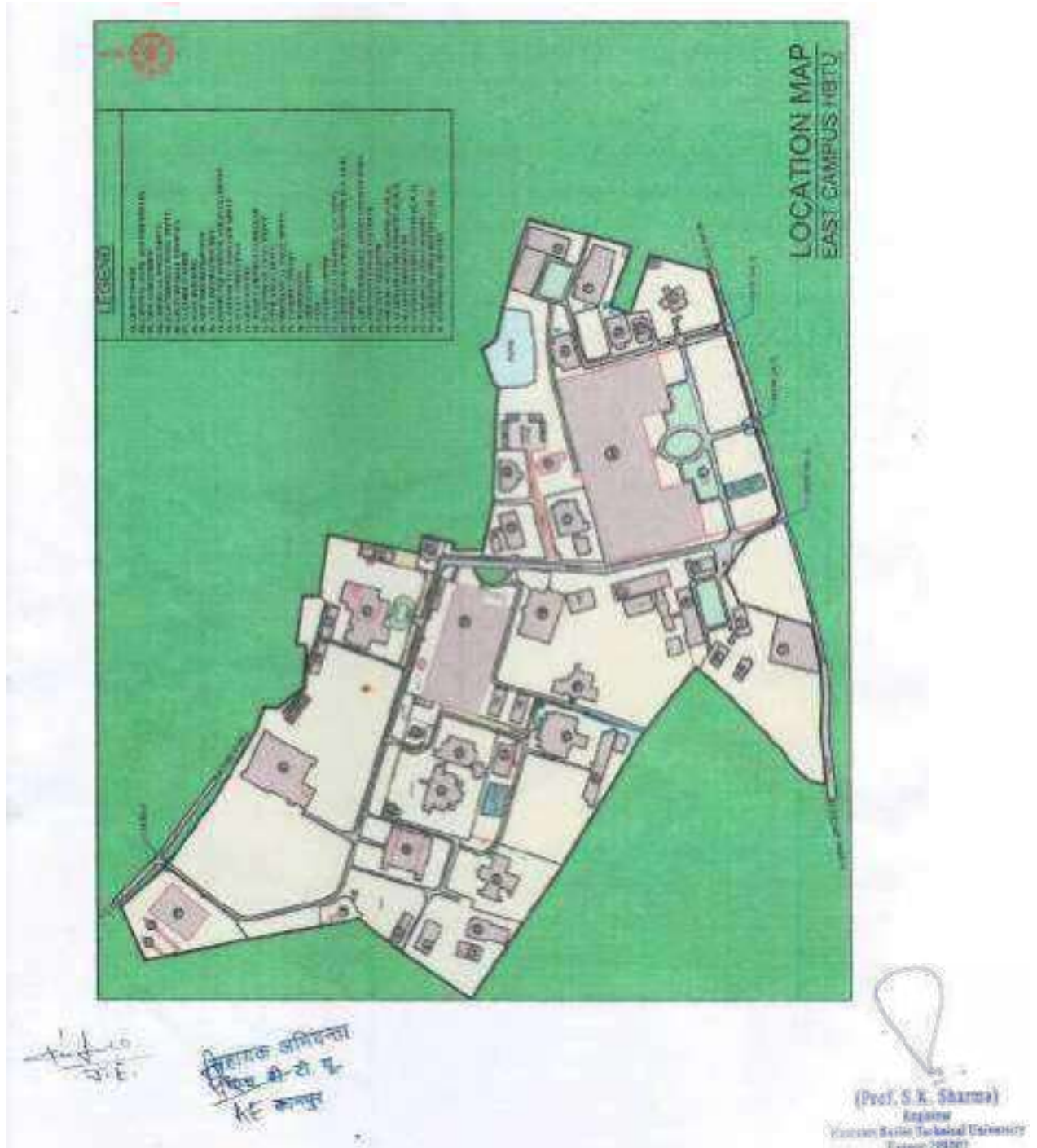
Latitude 26.49.50°N

Longitude 80.30.52°E





SITE MAP OF CAMPUS



Location map of East Campus





Location map of West Campus



(Prof. S. K. Sharma)
Engineer
Harcourt Butler Technical University
Kanpur-208002





FLORA & FAUNA DIVERSITY IN HBTU

HBTU is within the geo-position between East Campus: Latitude-26.4935°N and Longitude- 80.30.74°E and West Campus : Latitude-26.4950°N and Longitude-80.30.52°E in Kanpur, Uttar Pradesh, India. It encompasses an area of about 325 Acres. The area is immensely diverse with a variety of tree species performing a variety of functions. Most of these tree species are planted in different periods of time through various plantation programmes organized by the authority and have become an integral part of the University. The trees of the University have increased the quality of life, not only the University fraternity but also the people around of the University in terms of contributing to our environment by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, and supporting wildlife, controlling climate by moderating the effects of the sun, rain and wind. Leaves absorb and filter the sun's radiant energy, keeping things cool in summer. Many species of birds are dependent on these trees mainly for food and shelter. Nectar of flowers and plants is a favourite of birds and many insects. Leaf –covered branches keep many animals, such as birds and squirrels, out of reach of predators. Different species display a seemingly endless variety of shapes, forms, texture and vibrant colors. Even individual trees vary their appearance throughout the course of the year as the seasons change. The strength, long lifespan and regal stature of trees give them a monumental life quality. They also remind the glorious history of our University for lush greenery in particular. The existing & presently planted saplings give an emotional connection and sometime become personally attached to the ones during their course of growth. A thick belt of large shady trees in the periphery of the University have found to reduce noise level and cut down dust and aerosols. Thus, the University has been playing a





significant role in maintaining the environment in its surrounding areas.

DEVELOPMENT OF GREEN BELT

The HBTU authorities have always stressed the need of appropriate green belt area within & outside the university boundary. Thus the university has covered the maximum available area for development of green belt. To further increase the green-belt area the scheme is proposed as follows:

As per the movement of the prevailing wind direction at the plant site on yearly average basis, it can be said that the wind can rotate through all the angles and the specific direction movement cannot be considered.

Thus considering the scattered nature of fugitive emissions sources it is proposed to carry out extensive tree plantation along the roads, fuel stockpile and all other areas wherever feasible. In areas where it is not feasible to plant tall trees, shrubs and bushes are to be planted.

The guidelines for development of G.B. around and inside the unit are described in subsequent paragraphs.

GENERAL GUIDE LINES :

Trees growing upto 10 mtr. or more in height should be planted around the installation.

- Planting of trees should be undertaken in appropriate encircling rows around the installation in alternating rows to prevent horizontal pollution dispersion.
- Trees should be planted along the roadsides, to arrest the dust, auto-exhaust and noise pollution in such a way that there is no sight to the installation when viewed from a point outside foliage perimeter.
- Since tree trunks are normally devoid of foliage (upto 2 mtrs.), it would be appropriate to have shrubs in front of such trees to give coverage to this portion.





- Fast growing trees with thick perennial foliage should be grown, as it will take years for trees to grow to their full height.

The suitable plant species for development of green belt are enumerated as shown in the table.

Plant Species Identified for Green Belt Development

S.No.	Plant Species	Vernacular Name
1.	Alibizzia lebbek	Kalsiris
2.	Terminalia arjuna	Arjun
3.	Cassia Fistual	amaltas
4.	Polyalthia longifolia	Asoka
5.	Embelica officianalis	Amala
6.	Bauhinia variegata	Kachnar
7.	Mitragyna parviflora	Kadamb
8.	Pongamia pinnata	Kranj
9.	Cassia siamea	Kasod
10.	Dalbergia sissoo	Sheesham
11.	Delonix regia	Gulmohar
12.	Ficus glomerata	Gular
13.	Acacia nilotica	Keekar
14.	Cacia catechu	Khair
15.	Acacia arabica	Babul





16.	<i>Syzygium cumini</i>	Jamun
17.	<i>Mimusops elangi</i>	Maulsiri
18.	<i>Madhuca indica</i>	Mahua
19.	<i>Ficus bengalensis</i>	Bargad
20.	<i>Ficus religiosa</i>	Peepal
21.	<i>Azadirachta indica</i>	Neem
22.	<i>Casurina equisetifolia</i>	Jhau
SHRUB		
23.	<i>Nerium odourum</i>	Kaner
24.	<i>Parkinsonia aculeate</i>	Vilayati Jhau
25.	<i>Hibiscus rosasinesis</i>	Gudhal
26.	<i>Dracaena</i>	
27.	<i>Callistemon lanceolatus</i>	Bottle brush
28.	<i>Salvadora oleoids</i>	Peelu
29.	<i>Zizyphus mauritiana</i>	Ber
30.	<i>Lantana camara</i>	Kuri
31.	<i>prosopisjuliflora</i>	Vilayati babul





The plant-to-plant and row-to-row spacing on each greenbelt strip is 5 mtr. Depending upon the width of the greenbelt, the number of plant rows in each green belt varies from 4 to 17.

On roadsides 3 or 2 rows of plants on either side, the tree positions in the first row on either side will be in a staggering fashion with respect to those in the first row. In case of tree positions on the greenbelt strips also, tree positions in each row will be in a staggering fashion with respect to those on either side rows.

Table: Flora & Fauna Study in Buffer Zone:

Plant species	Abundance	Average	Minimum
	Buffer Zone	Buffer Zone	Buffer Zone
<i>Azadirachta indica (Neem)</i>	√		
<i>Ficus benghalensis (Bargad)</i>		√	
<i>Neolamarckia cadamba (Kadam)</i>	√		
<i>Calotropis procera (Mudar)</i>	√		
<i>Delonix regia (Gulmohar)</i>		√	
<i>Eucalyptus</i>	√		
<i>Saraca asoca (Ashoka)</i>			√
<i>Psidium guajara (Amrud)</i>			√
<i>Carica papaya (Papaya)</i>			√
<i>Musa acuminata (Banana)</i>			√
<i>Madhuca longifolia (Mahua)</i>			√
<i>Chitwan</i>		√	
<i>Bambusa Sp.</i>		√	
<i>Zizyphus Sp.</i>		√	
<i>Acacia nilotica</i>	√		
<i>Ficus religiosa (Peepal)</i>		√	
<i>Prosopis juliflora (Vilayati Babool)</i>	√		
<i>Acacia arabica (Babool)</i>			√
<i>Melia azaderach (Bakain)</i>			√
<i>Aegle marmelos (Bel)</i>			√
<i>Cassia fistula (Amaltas)</i>			√
<i>Tamarindus indica (Imli)</i>			√
<i>Dalbergia sissoo (Shisham)</i>		√	
<i>Hephophragma adanophyllum (Kath)</i>		√	



<i>Sagaun)</i>			
<i>Terminalia arjuna (Arjun)</i>		√	
<i>Feronia limonia (Kaith)</i>			√
<i>Syzygium cuminii (Jamun)</i>		√	
<i>Tectona grandis (Sagaun)</i>			√

Fauna species found in the buffer zone

Sr. No.	Common Name	Scientific Name	Schedule list as per Wildlife Protection Act
1	Toad	<i>Bufo sp</i>	
2	Frog	<i>Rana tigrina</i>	
3	Indian garden lizards	<i>Calotes versicolor</i>	
4	House lizards	<i>Hemidactylus sp.</i>	
5	Cobra	<i>Naja naja</i>	Schedule II
6.	Viper	<i>Vipera sp</i>	
7	Indian palm squirrel	<i>Fumambulus pennanti</i>	
8	Cat	<i>Felis sp.</i>	
9	Dog	<i>Canis lupus familiaris</i>	
10	Cow	<i>Bos sp.</i>	
11	Buffalo	<i>Bubalus bubalis</i>	
12	Horse	<i>Eqqus sp.</i>	
13	Newala	<i>Herpestes sp.</i>	
14	Rat	<i>Rattus rattus</i>	
15	Monkey	Rhesus macaque	
16	Crow	<i>Corves splendens</i>	
17	Sparrow	<i>Passer domesticus</i>	
18	Parrot	<i>Psittacula krameri</i>	





19	Peafowl	<i>Pavo cristatus</i>	Schedule I
20	Pigeon	<i>Columba livia</i>	
21	Bulbul	<i>Pycnonotus sp.</i>	
22	Maina	<i>Acridotheres tristis</i>	
23	Koel	<i>Eudynamys scolopacea</i>	
24	Pond Heron	<i>Ardeola grayii</i>	
25	Crimson breasted Wood pecker	<i>Dendrocopus cathpharius</i>	
26	Kite	<i>Milvus sp</i>	
27	Shikara	<i>Accipitor badius</i>	
28	Common quail	<i>Coturnix sp</i>	
29	Dove	<i>Streptopelio sp</i>	
30	Owl	<i>Bubo bubo</i>	
31	Butterflies	<i>Rhopalocera sp</i>	
32	Wasps	<i>Vespa orientalis</i>	
33	Dragonfly	<i>Agrian sp</i>	
34	Honey Bee	<i>Apis indica</i>	
35	House fly	<i>Musca domestica</i>	
36	Cockroach	<i>Periplanata sp.</i>	
37	Beetles	<i>Lasioderma sp.</i>	
38	Spider	<i>Pachlomerus sp.</i>	
39	Grasshopper	<i>Schistocera sp.</i>	





AIR & NOISE QUALITY OF HBTU

The AAQ & Noise quality as monitored at the university campus was found within the prescribed norms. The universities are further taking initiatives to further improve the environmental quality & thus the human health. The university has also planned to further increase its green-cover as a measure to enhance the ambient air quality & moreover to give an aesthetic look to the university campus.

The results of Ambient Air Quality (AAQ) as monitored at east & west campus is annexed.

The air quality data reveals that the AAQ at HBTU is well below the stipulated norms. The attribution for the same can be given to the existing lush green area & moreover significant traffic restriction practices which as such a integral part of the university.

WATER MANAGEMENT

At HBTU, Kanpur, a field survey was conducted by the audit team to find natural water bodies as well as fresh water consumption intake & its usage for varied purposes. The same are detailed as under:

Natural Water Bodies

1) Natural pond: In east campus, there is a natural pond near leather technology building which is currently under renovation by Nagar Nigam Authority to improve its aesthetic look.

2) Open wells: At HBTU, Kanpur, there are four Nos. of open wells out of which 2 Nos. of wells are situated at East Campus and 2 Nos. of wells are situated at West Campus. Presently the wells are not in use & are used as rain water harvesting system



3) Natural Low lying areas: There are several low lying areas at west campus where rainfall runoff is accumulated and is used for irrigation as well as natural course of percolation for rain water harvesting.

4) Water Intake: For domestic and other uses approx 695 KL water is extracted through bore wells and collected in 3 numbers of overhead tanks of 300 KL capacity each. Out of these 3 tanks, one is situated at East Campus and 2 numbers of tanks are situated at West campus. The water is abstracted through 3 Nos. of pumps of 25HP capacity each, one nos of pump is kept as standby for emergency needs. The total consumption of water for domestic and other uses is around 695KL for both the campus on full capacity utilization. The collected water is consumed by population of around 7000 people of whole campus through distribution lines.

Details of Overhead Tanks

S.No	Name of the tank	Capacity	Location
1	OHT-01	300 KL	East Campus
2	OHT-02	300KL	West Campus
3	OHT-03	300KL	West Campus

Out of above 03 OHT`s tanks one nos. is kept for emergency requirements.

The total population of the HBTU Campus is as under

Details of water requirement and waste water generation

S. No.	Purpose	Consumption rate (Ltr./D)	Usage persons/D	Total requirement (KL/D)	Waste water (Generation @ 80% D)
1	Institutional East Campus	35	3000 (Students & 350 staff)	117.25	93.8
2	Hostel East campus (8 Nos.)	125	1034	129.25	103.4





3	Hostel West campus (7Nos.)	125	1232	154	123.2
4	Residential Staff flats (East campus)	150	365	54.75	43.8
5	Residential Staff flats (East campus)	150	1150	172.5	138
6	Labs & R & D activities	50	100	5	4
7	Green-Belt development	Say 50 KL/D	-	50	Totally consumed
8	Canteens	20	600	12	9.6
9	Security guards	35	12	0.42	0.33
	Total		7843	695.17 Say 695	516.13 Say 516

The exact water accounting and balancing shall be done after installation of electro-magnetic flow-meter at raw water intake point. However, on reviewing the Environmental Management system & meetings with the concerned it was revealed that the same will be implemented in a short span of time to quantify the uses and disposal from various streams for wise usage of the natural resource water.

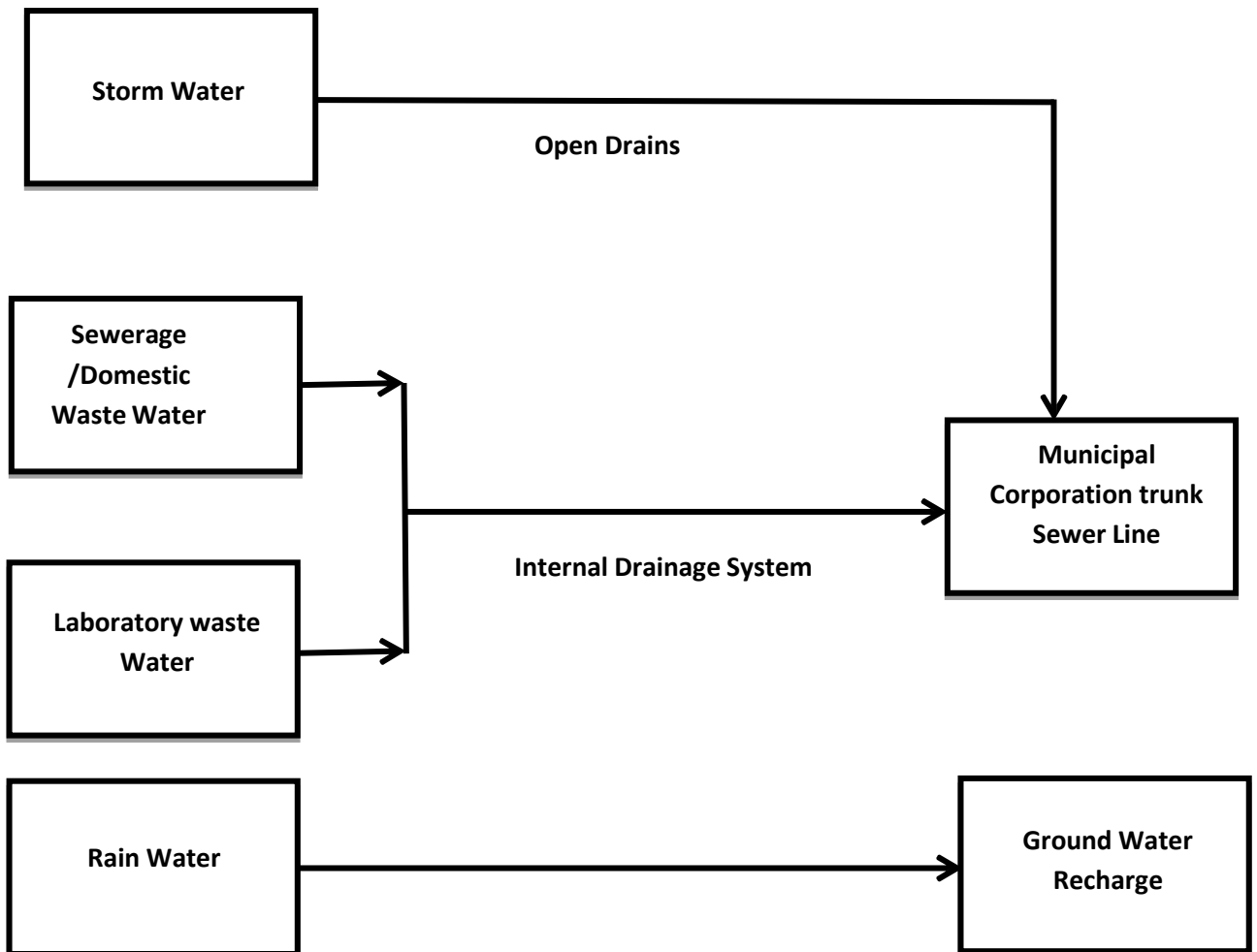




Waste water Disposal System

Domestic waste water and sewerage from east campus and west campus is finally discharged through internal drainage system which is ultimately discharged in municipal trunk sewer line. The water drainage flow chart is depicted as below :

East Campus

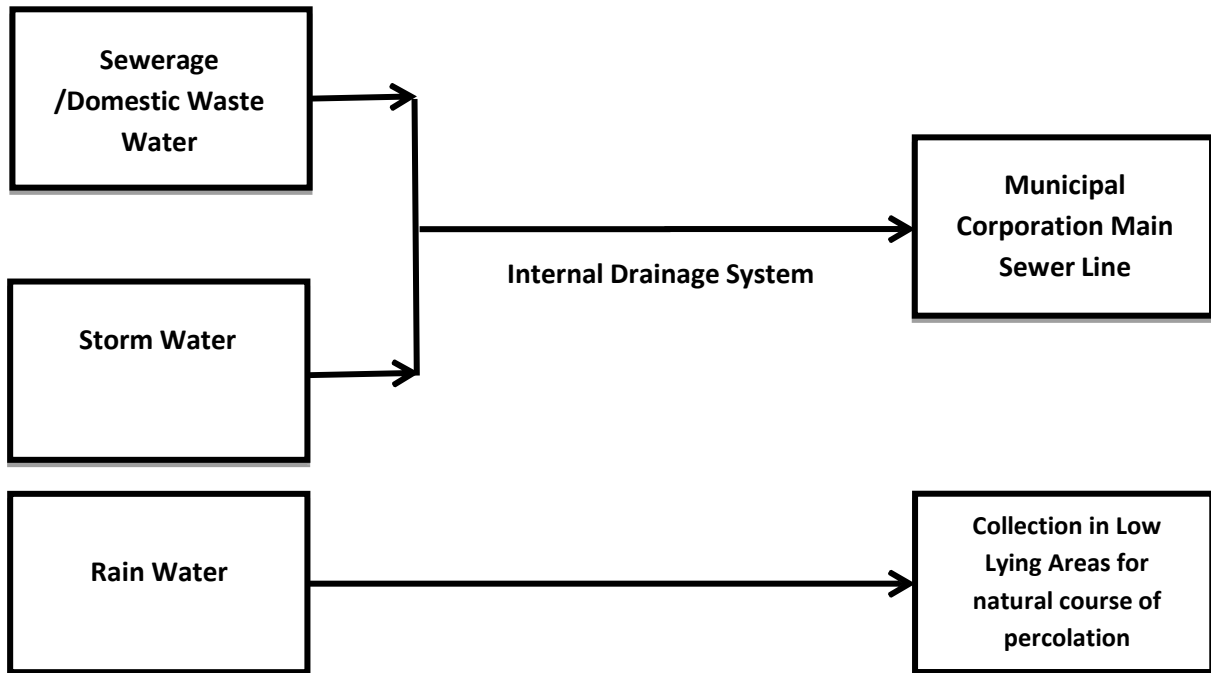


(Prof. S.K. Sharma)
Kanpur
Harcourt Butler Technical University
Kanpur





West Campus





RAW WATER CHARACTERISTICS (WEST CAMPUS)

S.No.	Parameter	Unit	Result	Specification/Limit (As per IS:10500:2012)	
				Desirable	Permissible
1	Color	Hazen	<5.0	5.0	15
2	pH	-	7.21	6.5-8.5	No Relaxation
3	Turbidity	NTU	<1	1.0	5.0
4	TDS	Mg/lit	246	500	2000
5	Chloride	Mg/lit	38.42	250	1000
6	Fluoride	Mg/lit	0.26	1.0	1.5
7	Total Alkalinity	Mg/lit	128	200	600
8	Total Hardness	Mg/lit	168	200	600
9	Sulphate	Mg/lit	26.34	200	400
10	Iron	Mg/lit	<0.05	0.3	No Relaxation
11	Arsenic	Mg/lit	<0.01	0.01	0.05



(Prof. S. K. Sharma)

Registrar

Harcourt Butler Technical University,
Kanpur-208002





SOLID WASTE MANAGEMENT

During site visit and interviews with officials of HBTU, we have tried to identify types of solid waste generated from different departments and activities. The solid waste generated at HBTU is tabulated here under with approximate quantities and their disposal methods. It was observed that biodegradable solid waste from kitchens, solid waste from maintenance and construction activities, lab waste, e-waste, battery waste are the main categories of solid waste generated at HBTU.

SOLID WASTE

S.No	Type of waste	Source of generation	Quantity per year (approx.)	Disposal method
1	Kitchen Waste	Canteen/Mess/ Residences	Not measured	Animal Feed
2.	Cartons	All Around	100 Kg	Scrap Vendors
3	Paper Waste	Residence /Offices	2000 Kg	Scrap Vendors
4.	Garden Waste	Gardens	1200 Kg	For manure
5.	Broken Glass Wares	Laboratories	250 Kg	Scrap Vendors
6.	House Hold Waste	From Residences/Hostels	1286 Kg/D	Dump yard
7.	Scrap Equipment	Departments	300 Kg	Scrap Vendors



HAZARDOUS WASTE/MEDICAL WASTE

S.No	Type of waste	Source of generation	Quantity per year (approx.)	Disposal method
1	E-Waste	All Around	Stored	Scrap Vendors
2	Batteries/ Electrical	All Around	Stored	Scrap Vendors
3	Plastic Bags/ Packing	All Around	100 Kg	Scrap Vendors
4	Mask/Tablet Strips	Medical Centre/ all Around	20 Kg	Dustbins
5	Sanitary Used Napkins	Girls Hostels/ Residences	50 Kg	Dustbins
6	Lube Oil / Filters	Generator Sets	50 Ltr	Scrap Vendors

Apart from Commercial valued solid waste which is disposed through scrap policy of the university, all domestic other solid waste is collected from different generation sources by housekeeping staff in manual rickshaw trolleys, handcarts and dumped into nearby municipal demarked dumping yards as designated by Nagar Nigam authority for final disposal.





ENERGY MANAGEMENT

The current power supply system was reviewed, energy bills for one year of UPSEB and generator backup system to meet out the energy requirements of university the details are as under:

1) UPSEB – Sub Station – 33/11 KVA – East Campus

2) Generators – 15 KVA & 75 KVA Capacity each – East Campus
250 KVA & 10 KVA Capacity each – West Campus

Total Running Hours of Generators during Power Break and shut downs

East Campus = 15-20 Hours per month

West Campus = 30 -40 Hours

Acoustic enclosure in one Genset of 250 KVA only

3) Transformers – 889 KVA & 630 KVA(05)–Total 6 Numbers–East Campus
630 KVA (05) – West Campus

Total Energy Consumption of HBTU East and West Campus Based on Review of Bills of last One Year 2021-2022

East Campus

Total units Consumed in 12 Months (2021-2022)= 12,75,979 (Units)

Average Units Consumption Per Month = 1,06,331 (Units)

Amount Incurred Per Year = Rs. 1,60,85,252/-

Average Amount Per Month = Rs. 13,40,437/-

West Campus

Total units Consumed in 12 Months (2021-2022) = 3,72,905 (Units)





Average Units Required Per Month	= 31,075 (Units)
Amount Incurred Per Year	= Rs. 5780250
Average of Amount Per Month	= Rs. 4,81,687

Total Units Consumed in Last 12 Months as per 2021-2022 for East and West Campus =1648884 (Units) Per Year

Amount Paid for Energy Requirements in 2021-2022 is around
= Rs. 2,18,65,502/- (East and West Campus)

The Figures Above are Showing That Around 3.5% of the Total annual Budget is spent for University Energy Needs. The collected data reveals that university is totally dependent on UPSEB supply and generator backup for energy needs.

Solar Energy uses – Negligible





FUEL CONSUMPTION/CARBON FOOTPRINT POSSIBILITIES AT HBTU CAMPUS

1. Diesel in Generators 700 Ltr. Per Month
2. Av. Petrol consumption in Official Vehicles = 489 Ltr. Per Month
3. Av. Diesel consumption in Official Vehicles = 264 Ltr. Per Month
4. LPG in Mess and Canteen =30 commercial cylinders of 19 Kg per month
5. LPG uses by Resident population in staff flats =Approx.303 Domestic cylinders of 14 Kg. per month
6. Visitors Vehicles 100 per Day x1 Ltr. = 100 Ltr/Day .
7. Staff Cars 100x1Ltr=100 Ltr Per Day
8. Staff Bikes =250 x0.5 Ltr Per day =125 Ltr Per Day
9. Material Movement Vehicles 5 per day x1 Ltr =5 Ltr.Per Day
- 10.Students Bikes 350 per Day = 350x0.5 Ltr Per Day =175 Ltr Per Day
- 11.Students Cars x 30x1Litre Per Day = 30 Ltr Per Day

Above Data is based on to and fro Distances covered by vehicles of around 14 Km. Per Day from university east campus to west campus. This makes the possibility of Carbon Foot Print at different Locations. A detailed study of Carbon foot print is necessary to explore the reality.


(Prof. S. K. Sharma)
Registrar
Harcourt Butler Technical University
Kanpur-208002





GREEN AND ENVIRONMENTAL PRACTICES AT HBTU

1. Green Campus

During our field survey and document verification it was found that entire green area is covered by nos. of tree species, plants, flower plants, vegetables plants, pot plants and hedges road side plantation including the deciduous forests. The university is practicing massive plantation work on regular intervals. The team of outsourced gardeners are taking care and maintaining the green belt of the university. Around 60 lakhs per annum is being spent on house-keeping and maintenance of gardens which approximately 1% of the total annual budget of the university.

2. Environmental Awareness

The audit team investigated the HBTU staff/students to check the environmental awareness level for further improvement. It was found that level of consciousness regarding environmental issues was satisfactory. There is an environmental management plan which was documented in 2019 and is in practice at present. To implement guidelines of environmental legislation in the university campus. University is having its own environmental laboratory for testing of various environmental parameters. The university is in stage of preparing an official environmental policy to be implemented in near future for the strict compliance of environmental regulations.

3. Waste Management

Waste water management

The observation made therein reveals that there are some shortcomings regarding waste water management for which the University management has planned to rectify in near future by the way of installing a Sewage Treatment Plant (STP).



Rain water harvesting

During interviews of maintenance department officials we were informed about practice of ground water recharging through rain water harvesting systems installed in different blocks of university. Some new buildings are under construction and in every new block provision of rain water harvesting is planned. Here under is a list of places, where rain water harvesting system have already been implemented and are working successfully. The rain water harvesting system were installed during from the year 2020-2022

1. Mechanical Engineering Building.
2. Lecture Theatres
3. New Auditorium
4. Electronics Engineering Building
5. Chemical Engineering Building
6. Kavery Girls Hostel
7. Saraswati Girls Hostel
8. Some other new blocks.

Existing ponds and low line areas for conservation of rain water

There are some low lying areas situated at the west campus and 4 nos. of abandoned wells are presently used for conservation of rain water. There is also a natural pond located in east campus which is under renovation for beautification by Nagar Nigam authority.

Air Quality

University is committed to maintain good emission inside both of the campuses and in this regard the green belt and regular plantation are main area of concern. The plantation of new saplings at different open areas of the university is a regular feature.



Solid Waste Management

Review of documents and physical observations reveals that commercial valued solid waste (scrap) is disposed to registered vendors through tendering process of universities scrap policy. Other solid wastages including some quantity of hazardous and other waste shall be disposed as per the regulatory guideline. Currently domestic solid waste including paper, cottons, kitchen waste and garden waste is disposed by traditional manual methods. The waste is collected by housekeeping staff in rickshaw trolley and handcarts and dumped into waste collection yards as identified by municipal authorities. In some areas waste is also segregated, the university has installed waste segregation dustbins all around the academic building and offices. So that wet and dry waste can be segregated and collected separately for its ultimate disposal. In proposed environmental policy of the university some initiative for much better solid waste management are under process.

The university has planned and initiated for installation of a bio-composting plant at west campus for which the space and shade shall be provided by the university and all operational part will be taken care by Nagar Nigam Authority. An agreement regarding this initiative is under process.

4. Energy Management

We have found that at present university is totally dependent on State Power Supply Corporation and generator backup to fulfill the energy needs during power failure. There are some areas of concern where university is taking initiatives to plan utilization of renewable energy sources to reduce heavy expenditure of energy.



5. Carbon Foot Print

The uses of fossil fuels for cooking and vehicles always make the possibility of CO₂ emissions. The massive use of air conditioners is an area of concern for energy conservation and moreover reduces the possibilities of green emissions as well as the carbon foot print reduction.

6. House Keeping

Satisfactory level of housekeeping and cleanliness is found in offices, laboratories, hostels, roads, residential area, canteen and hostel mess. The regular maintenance of drainage system, cleaning of water collection tank, corridors, drinking water, coolers is practiced for maintaining cleanliness and hygienic condition all around university campus.

7. Paper Free Governance And E-Learning Facilities

University is practicing paper free governance in offices, in inter departmental communications and the whole campus is provided with free wifi facilities to motivate students and staffs for paper free communication. Where modern e-learning facilities are available in classrooms, lecture theatres, auditorium, library to impact for minimum uses of paper inside the university. In this regard no. of official circulars is being disseminated among student and other staff.

8. Other Facilities

The university has provided ATM facility, postal facility, Modern cafeteria, medical facility, sports facility, auditorium for cultural programs, ambulance etc. for students and staff.



9. Awareness About Safety Features

University has installed appropriate nos. of fire extinguisher of all types at prominent locations to meet out any eventuality. There is an EMP plan where some imitative have been taken for laboratory safety.

10. Pest Control

There is a schedule for regular pest control in identified areas. At least twice a year pest control is done by local parties through tendering process.

11. Infectious Disease Awareness

We have found that various awareness slogans & posters are displayed at prominent locations of the university campus along with notice boards inside the university. A COVID-19 Help Desk is existing in main building reception area. Students are also counseled about health issues regularly through various awareness programs.





RECOMMENDATIONS

1. The university should formulate its own environmental policy.
2. The university may establish a purchase policy for environmental friendly material.
3. The University may conduct more seminar and ground discussions on environmental awareness.
4. The students/staff can be permitted to solve local environmental issues.
5. Renovation of cooking system in the canteen/hostel mess to save gas for reduction for use of fossils fuels.
6. The slogans, posters, banners may be displayed all over the campus for further improvement in green practices.
7. All trees in the campus should be named and quantified.
8. The university can also frame internal eco-friendly green committee or club for making campus green.
9. Encouraging students not just through words, but also through action for making the campus green.
10. Conducting inter-university and internal competitions among departments for making students more interested for green practices.
11. University may establish a system of car pooling among the staff to reduce the no. of four wheelers coming to the university.
12. Discourage the students using two wheelers for irrelevant use within the campus.
13. The carbon generation awareness programs on carbon emission due to vehicles, hostel mess & canteen facilities should be propagated at individual as well as social level. This practice will help to further improve the air and noise pollution in the campus.
14. The university may enhance the budget for plantation and maintenance of green belt.



15. Display boards for all plants identified can be installed.
16. Lab waste water quantity should be treated prior discharge in municipal drainage system.
17. A plan may be formulated for chemical consumption and its purchase.
18. The university may take initiative for sewage treatment plant facility for primary treatment of wastewater.
19. Composting of generated bio degradable waste from hostel mess & canteens should be practiced for organic manure generation & thereby reduction in procured chemical based manure.
20. The university may declare the whole campus plastic and tobacco free.
21. The university may revise its current environmental management plan for better waste segregation and adequate disposal of hazardous, e-waste with authorized vendors.
22. The university should immediately plan for use of renewable energy sources and replacement of power equipment of heavy loads with power saving equipments.
23. Department wise electrical load consumption is to be done for wise usage of procured electric power.
24. Awareness for energy and water conservation among students and staff should be taken on priority.
25. Awareness among students and staff about green environment shall be done use tools like display boards/camps.
26. The university to further increase their green cover may adopt the prevailing "Miyawaki Technique" of plantation.





MAIN BUILDINGS



Main Gate



Main Building



Corridor



Mechanical Engg. Dept.





Auditorium



Auditorium



Medical Centre



ATM



Library



Cafeteria





Class Room



Class Room



Guest House



Community Hall





Gen-X Incubation Centre





HOSTELS

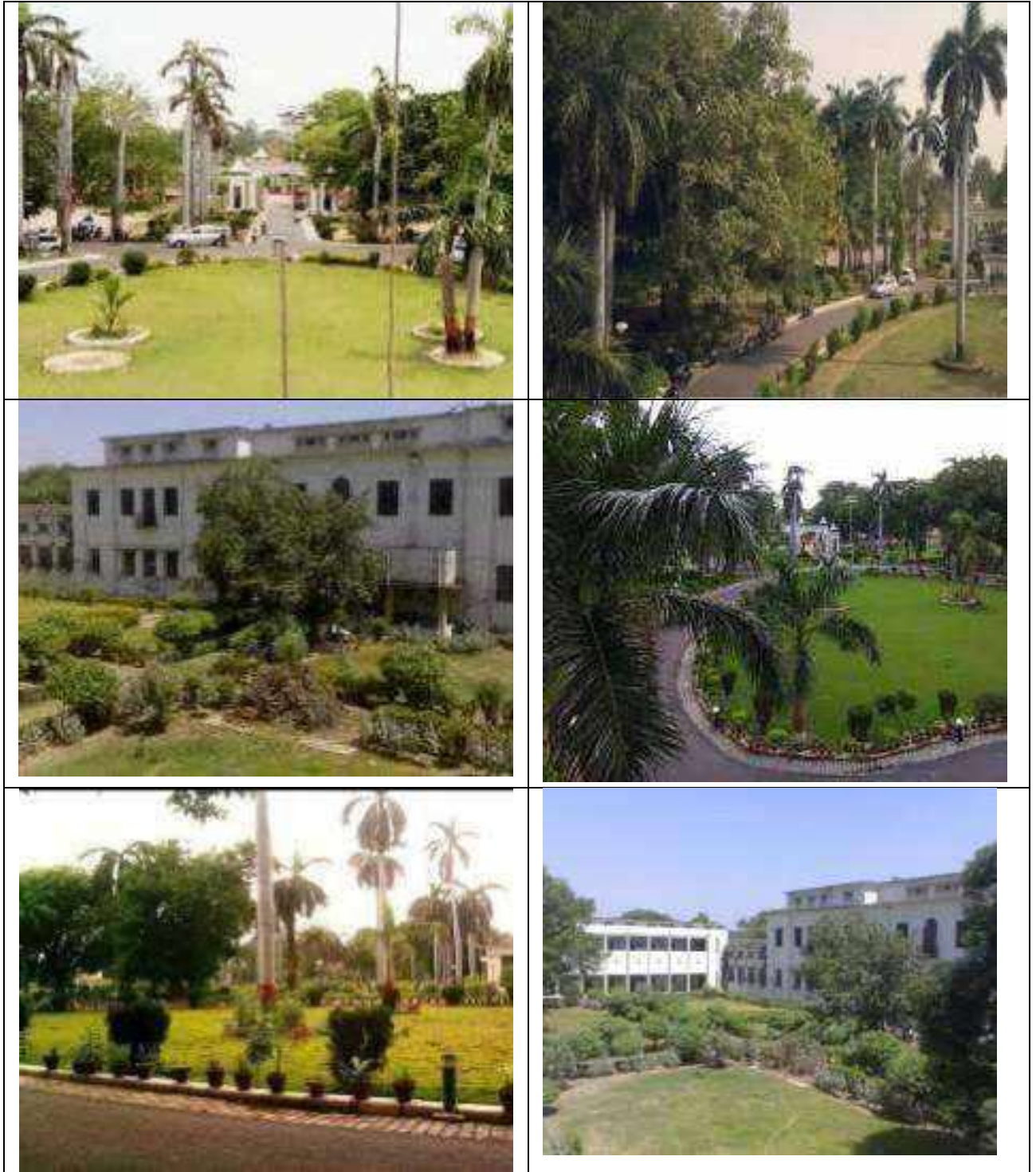



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Engineer
Harcourt Butler Technical University
Kanpur-208002





GREEN AREAS AND LAWNS





SPORTS FACILITIES





PLANTATION DRIVE PHOTOGRAPHS





GREEN PRACTICES




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 Kanpur 208002

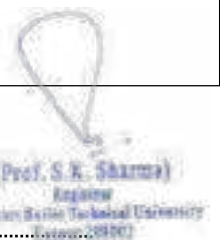




100 Year Celebration



CLEAN ROADS





AWARENESS SLOGANS & COVID HELP DESK





WASTE COLLECTION DUSTBINS





ANNEXURE: TEST REPORTS





TEST REPORT

TEST REPORT NO.: FTS1235/07/2022 | LR/NO. TC6771220/0001235F | DATE OF REPORT: 20-07-2022

WATER SAMPLE ANALYSIS REPORT

Name And Address of Customer : M/s, HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002

Date of Sample Received : 20.07.2022

Analysis Start Date : 21.07.2022

Analysis End Date : 25.07.2022

Sample ID No : 1235

Sampling Done By : ETS STAFF

Sampling Description : GROUND WATER

Sampling Location : BOREWELL WATER-I (EAST CAMPUS)

Sampling Method : IS 3025 (Part-1)

Sample Quantity : 2.0+0.5 Ltr

Packing Condition : SEALED

Packed In : P.V.C. AND GLASS BOTTLE



S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)		Test Method
				Desirable	Permissible	
PHYSICAL & CHEMICAL PARAMETERS:						
1	Colour	Hazen	<5.0	5	15	APHA 2120-B
2	Odour	---	Agreeable	Agreeable	Agreeable	APHA 2150-B
3	Taste	---	Agreeable	Agreeable	Agreeable	APHA 2160-C
4	Turbidity	NTU	<1	1	5	APHA 2130-B
5	pH	---	7.84	6.5 - 8.5	No Relaxation	APHA 4500-H+
6	Total Dissolved Solids, (TDS)	mg/L	272.0	500	2000	APHA 2540-C
7	Total Alkalinity, (CaCO ₃)	mg/L	143.0	200	600	APHA 2320-B
8	Total Hardness, (CaCO ₃)	mg/L	187.0	200	600	APHA 2340-C
9	Calcium, (Ca)	mg/L	38.0	75	200	APHA 3500:(Ca)-B
10	Magnesium, (Mg)	mg/L	22.4	30	100	APHA 3500 (Mg)-B
11	Chloride, (Cl)	mg/L	44.30	250	1000	APHA 4500:(Cl ⁻)-B
12	Sulphate, (SO ₄)	mg/L	28.40	200	400	APHA 4500:(SO ₄)-E
13	Nitrate, (NO ₃)	mg/L	8.50	45	No Relaxation	APHA 4500:(NO ₃)-B
14	Fluoride, (F)	mg/L	0.18	1	1.5	APHA 4500:(F ⁻)-D
15	Anionic Detergent, (MBAS)	mg/L	<1.0	0.2	1	APHA 5540-C
16	Mineral Oil	mg/L	<1.0	1.0	No Relaxation	IS 3025 (Part-39)
17	Free Chlorine (Residual)	mg/L	<0.1	0.2	1	APHA 4500:(Cl ⁻)-B

For Enviro-Tech Services

Rushkar Mittal
AUTHORIZED SIGNATORY
Lab In-charge

CHECKED BY
SHRADDHA GUPTA
ETS-LAB

Page 1 of 3

Format No ETS/LAB/TR-09, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

Notes:-

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(Prof. S.K. Sharma)
Regional
Vice-Chancellor, Technical University
Etawah-208002



TEST REPORT

TEST REPORT NO.: ETS/1235/d7/2022 URL NO TC87712200001235F DATE OF REPORT: 25.07.2022

WATER SAMPLE ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)		Test Method
				Desirable	Permissible	
HEAVY METALS:-						
18	Arsenic (As)	mg/L	<0.01	0.01	No Relaxation	APHA 3120B
19	Lead,(Pb)	mg/L	<0.01	0.01	No Relaxation	APHA-3120B
20	Zinc as Zn	mg/L	0.12	5.0	15	APHA-3120B
21	Boron,(B)	mg/L	0.18	0.5	2.4	APHA 4500,(B)
22	Mercury,(Hg)	ug/L	<0.1	0.001	No Relaxation	US EPA Method 200.7 1994
23	Cadmium,(Cd)	mg/L	<0.01	0.003	No Relaxation	APHA 3120B
24	Copper,(Cu)	mg/L	<0.01	0.05	1.5	APHA 3120B
25	Iron,(Fe)	mg/L	<0.05	1.0	No Relaxation	APHA-3120B
26	Manganese,(Mn)	mg/L	<0.01	0.1	0.3	APHA-3120B
27	Phenolic Compound,(C ₂ H ₅ OH)	mg/L	<0.01	0.001	0.002	APHA 5530-C



(Prof. S.K. Sharma)
Engineer
K. J. Somaiya Institute of Technical Education
Ester, 20002



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ETS-LAB

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For Enviro Tech Services



P. Shikha Mittal
AUTHORIZED SIGNATORY

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TEST REPORT

TEST REPORT NO.: ETS/1234/07/2022

DATE OF REPORT: 25-07-2022

WATER SAMPLE ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)	Test Method
MICROBIOLOGICAL PARAMETER;					
28	Escherichia coli	MPN/100mL	Absent	Shall Not Be Detectable	IS1622:2019
29	Total Coliform	MPN/100mL	Absent	Shall Not Be Detectable	IS1622:2019

End of the report


 (Prof. S. K. Sharma)
 Registrar
 Yashwantrao Chavan Pratishthan
 Lucknow-226002



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 (Prof. S. K. Sharma)
 Registrar
 Yashwantrao Chavan Pratishthan
 Lucknow-226002



Plot No. 1/32, South Side G.T. Road Industrial Area, Ghaziabad (U.P.) - 201001

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TEST REPORT

TEST REPORT NO.: ETS/1236/07/2022 URLNO.TC877122000001236F DATE OF REPORT: 25.07.2022

WATER SAMPLE ANALYSIS REPORT

Name And Address of Customer : M/s. HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002

Date of Sample Received : 20.07.2022
Analysis Start Date : 21.07.2022
Analysis End Date : 25.07.2022
Sample ID No : 1236
Sampling Done By : ETS STAFF
Sampling Description : GROUND WATER
Sampling Location : BOREWELL WATER-II (WEST CAMPUS)
Sampling Method : IS 3025 (Part-1)
Sample Quantity : 2.0+0.5 Ltr
Packing Condition : SEALED
Packed In : P.V.C. AND GLASS BOTTLE



S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)		Test Method
				Desirable	Permissible	
PHYSICAL & CHEMICAL PARAMETERS:						
1	Colour	Hazen	<5.0	5	15	APHA 2120-B
2	Odour	...	Agreeable	Agreeable	Agreeable	APHA 2150-B
3	Taste	...	Agreeable	Agreeable	Agreeable	APHA 2160-C
4	Turbidity	NTU	<1	1	5	APHA 2130-B
5	pH	...	7.21	6.5 - 8.5	No Relaxation	APHA 4500-H+
6	Total Dissolved Solids.(TDS)	mg/L	246.0	500	2000	APHA 2540-C
7	Total Alkalinity.(CaCO3)	mg/L	128.0	200	600	APHA 2320-B
8	Total Hardness.(CaCO3)	mg/L	168.0	200	600	APHA 2340-C
9	Calcium.(Ca)	mg/L	30.6	75	200	APHA 3500:(Ca)-B
10	Magnesium.(Mg)	mg/L	22.2	30	100	APHA 3500:(Mg)-B
11	Chloride.(Cl)	mg/L	38.42	250	1000	APHA 4500:(Cl-) -B
12	Sulphate.(SO4)	mg/L	26.34	200	400	APHA 4500:(SO4)-E
13	Nitrate.(NO3)	mg/L	7.62	45	No Relaxation	APHA 4500:(NO3)-B
14	Fluoride.(F)	mg/L	0.26	1	1.5	APHA 4500:(F-) -D
15	Anionic Detergent.(MBAS)	mg/L	<1.0	0.2	1	APHA 5540-C
16	Mineral Oil	mg/L	<1.0	1.0	No Relaxation	IS 3025 (Part-39)
17	Free Chlorine (Residual)	mg/L	<0.1	0.2	1	APHA 4500:(Cl)-B



1. SHRADDHA GUPTA AB HOLOGRAM are not issued by our laboratory.

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(Prof. S. K. Sharma)
Engineer
Yamuna Bank Technical University
Etawah-208002

For Enviro-Tech Services

AUTHORIZED SIGNATORY



ETS-LAB



ENVIRO-TECH SERVICES

An Analytical Laboratory

(A GOVERNMENT APPROVED LAB)

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ISO 9001/14001/45001

TEST REPORT

TEST REPORT NO.: ETS/1236/07/2022

URLNO.TC87712200001236F

DATE OF REPORT: 26.07.2022

WATER SAMPLE ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)		Test Method
				Desirable	Permissible	
HEAVY METALS:-						
18	Arsenic, (As)	mg/L	<0.01	0.01	No Relaxation	APHA 3120B
19	Lead, (Pb)	mg/L	<0.01	0.01	No Relaxation	APHA-3120B
20	Zinc as Zn	mg/L	0.17	5.0	15	APHA-3120B
21	Boron, (B)	mg/L	0.23	0.5	2.4	APHA 4500: (B)
22	Mercury, (Hg)	ug/L	<0.1	0.001	No Relaxation	US EPA Method 200.7 1994
23	Cadmium, (Cd)	mg/L	<0.01	0.003	No Relaxation	APHA 3120B
24	Copper, (Cu)	mg/L	<0.01	0.05	1.5	APHA 3120B
25	Iron, (Fe)	mg/L	<0.05	1.0	No Relaxation	APHA-3120B
26	Manganese, (Mn)	mg/L	<0.01	0.1	0.3	APHA-3120B
27	Phenolic Compound, (C ₆ H ₅ OH)	mg/L	<0.01	0.001	0.002	APHA 5530-C

(Prof. S.K. Sharma)

Engineer
Vivekananda Technical University
Etawah-208002

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SHRADDHA GUPTA

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TEST REPORT

TEST REPORT NO. ETS/3396/07/2022

DATE OF REPORT: 25.07.2022

WATER SAMPLE ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per IS:10500: 2012)	Test Method
MICROBIOLOGICAL PARAMETER;					
28	Escherichia coli	MPN/100mL	Absent	Shall Not Be Detectable	IS1622:2019
29	Total Coliform	MPN/100mL	Absent	Shall Not Be Detectable	IS1622:2019

End of the report



(Prof. S.K. Sharma)
Engineer
Veerdevi Institute of Technology
Etawah-208002

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TEST REPORT

TEST REPORT NO.: ETS/1227/07/2022 URLNO:TC87712200001227F DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

Name And Address of Customer : M/s, HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002



TC-8771

Date of Monitoring : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Duration Of Monitoring : 20.07.2022 To 21.07.2022
 Time Of Monitoring : 09.30 AM To 08.35 AM (CO&O₃ for 1.0 Hrs.)
 Sample ID No : 1227
 Sampling Done By : ETS STAFF
 Sampling Location : NEAR MAIN GATE (EAST CAMPUS)
 Sampling Method : ETS/STP/AIR-01
 Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL
 Weather Condition : CLEAR Ambient Temperature: 34.0 °C
 Wind Direction : E To W
 Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters, (PM ₁₀)	µg/m ³	90.50	For 24 Hrs. =100	IS 5182 (Part-23)
2	Particulate Matters, (PM _{2.5})	µg/m ³	46.10	For 24 Hrs. =60	IS 5182 (Part-24)
3	Sulphur Dioxide, (SO ₂)	µg/m ³	12.65	For 24 Hrs. =80	IS: 5182 (Part-2)
4	Nitrogen Dioxide, (NO ₂)	µg/m ³	25.20	For 24 Hrs. =80	IS: 5182 (Part-6)



Page 1 of 2

For Enviro-Tech Services

(Signature)
AUTHORIZED SIGNATORY
Lab in-charge

Format No ETS/LAB/TR-01, Issue No. 05, Date 01.04.2019, Amd. No. 04 Date 01.04.2019

(Signature)
(Prof. S.K. Sharma)
Engineer
Harcourt Butler Technical University
Kanpur

Note:-

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ENVIRO-TECH SERVICES

An Analytical Laboratory

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TEST REPORT

TEST REPORT NO.: ETS/1227/07/2022

DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide, (CO)	mg/m ³	0.75	For 8 Hrs =2 / For 1 Hrs =4	IS 5182 : Part 10

*****End of Test Report*****



Page 2 of 2

For Enviro-Tech Services

[Signature]
Rajesh Mittal
Lab-in-charge
AUTHORIZED SIGNATORY

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(Prof. S. K. Sharma)

Assistant
Professor
GGS Indraprastha University
Gurgaon



TEST REPORT

TEST REPORT NO.: ETS/1228/07/2022 URLNO.TC877122000001228F DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

Name And Address of Customer : M/s, HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU) NAWABGANJ, DISTT. - KANPUR (U.P.)-208002



Date of Monitoring : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Duration Of Monitoring : 20.07.2022 To 21.07.2022
 Time Of Monitoring : 09.25 AM To 08.30 AM (CO&O₂ for 1.0 Hrs.)
 Sample ID No : 1228
 Sampling Done By : ETS STAFF
 Sampling Location : NEAR AUDITORIUM (EAST CAMPUS)
 Sampling Method : ETS/STP/AIR-01
 Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL
 Weather Condition : CLEAR Ambient Temperature: 34.0 °C
 Wind Direction : E To W
 Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters.(PM ₁₀)	µg/m ³	55.10	For 24 Hrs.=100	IS 5182 (Part-23)
2	Particulate Matters.(PM _{2.5})	µg/m ³	28.90	For 24 Hrs.=60	IS 5182 (Part-24)
3	Sulphur Dioxide, (SO ₂)	µg/m ³	8.80	For 24 Hrs.=80	IS: 5182 (Part-2)
4	Nitrogen Dioxide,(NO ₂)	µg/m ³	20.50	For 24 Hrs.=80	IS: 5182 (Part-6)

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 SHRADDHA GUPTA

AUTHORIZED SIGNATORY

(Prof. S.K. Sharma)
 Engineer
 Harcourt Butler Technical University
 Kanpur-208002

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An Analytical Laboratory

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TEST REPORT

TEST REPORT NO.: ETS/r/228/07/2022


DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide,(CO)	mg/m ³	0.60	For 8 Hrs. =2 / For 1 Hrs =4	IS 5182 : Part 10

*****End of Test Report*****

Page 2 of 2


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TEST REPORT

TEST REPORT NO.: E1511229/07/2022 URLNO:TC877122000001229F DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

Name And Address of Customer : M/s, HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU) NAWABGANJ, DISTT. - KANPUR (U.P.)-208002



Date of Monitoring : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Duration Of Monitoring : 20.07.2022 To 21.07.2022
 Time Of Monitoring : 09.00 AM To 08.05 AM (CO&O₂ for 1.0 Hrs.)
 Sample ID No : 1229
 Sampling Done By : ETS STAFF
 Sampling Location : NEAR LAKE VIEW HOSTEL (EAST CAMPUS)
 Sampling Method : ETS/STP/AIR-01
 Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL
 Weather Condition : CLEAR Ambient Temperature: 34.0 °C
 Wind Direction : E To W
 Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters.(PM ₁₀)	µg/m ³	59.80	For 24 Hrs.=100	IS 5182 (Part-23)
2	Particulate Matters.(PM _{2.5})	µg/m ³	27.20	For 24 Hrs.=60	IS 5182 (Part-24)
3	Sulphur Dioxide, (SO ₂)	µg/m ³	9.50	For 24 Hrs.=80	IS: 5182 (Part-2)
4	Nitrogen Dioxide.(NO ₂)	µg/m ³	21.80	For 24 Hrs.=80	IS: 5182 (Part-6)



For Enviro-Tech Services

Pushkar Mittal
Lab in-charge
AUTHORIZED SIGNATORY

(Prof. S.K. Sharma)
Engineer
Harcourt Butler Technical University
Kanpur

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ENVIRO-TECH SERVICES

An Analytical Laboratory

(A GOVERNMENT APPROVED LAB)

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TEST REPORT

TEST REPORT NO.: ETS/1229/07/2022

DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide,(CO)	mg/m ³	0.32	For 8 Hrs.*2 / For 1 Hrs.*4	IS 5182 : Part 10

*****End of Test Report*****



Page 2 of 2

For Enviro-Tech Services
Shraddha Mittal
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(Prof. S.K. Sharma)
Expert
Director General
Central Board of Secondary Education
New Delhi-110002



TEST REPORT

TEST REPORT NO.: ETS/1230/07/2022 URLNO.TC877122000001230F DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

Name And Address of Customer : M/s. HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002



Date of Monitoring : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Duration Of Monitoring : 20.07.2022 To 21.07.2022
 Time Of Monitoring : 09.30 AM To 08.35 AM (CO&O₃ for 1.0 Hrs.)
 Sample ID No : 1230
 Sampling Done By : ETS STAFF
 Sampling Location : NEAR MAIN GATE (WEST CAMPUS)
 Sampling Method : ETS/STP/AIR-01
 Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL
 Weather Condition : CLEAR Ambient Temperature: 34.0 °C
 Wind Direction : E To W
 Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters.(PM ₁₀)	µg/m ³	68.20	For 24 Hrs.=100	IS 5182 (Part-23)
2	Particulate Matters.(PM _{2.5})	µg/m ³	30.90	For 24 Hrs.=60	IS 5182 (Part-24)
3	Sulphur Dioxide. (SO ₂)	µg/m ³	8.95	For 24 Hrs.=80	IS: 5182 (Part-2)
4	Nitrogen Dioxide.(NO ₂)	µg/m ³	19.20	For 24 Hrs.=80	IS: 5182 (Part-6)



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ANALYTICAL LABORATORY
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(Prof. S.K. Sharma)
Engineer
Harcourt Butler Technical University
Etawah-208002



TEST REPORT

TEST REPORT NO.: ETS/1250/07/2022

DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide (CO)	mg/m ³	0.28	For 8 Hrs. *2 / For 1 Hrs. *4	IS 5182 : Part 10

*****End of Test Report*****

Page 2 of 2

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(Prof. S.K. Sharma)

Director
GGS Indraprastha University
New Delhi-110028



TEST REPORT

TEST REPORT NO.: ETS/1231/07/2022 URLNO.TC877122000001231F DATE OF REPORT 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT



Name And Address of Customer : M/s. HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU) NAWABGANJ, DISTT. - KANPUR (U.P.)-208002

Date of Monitoring : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Duration Of Monitoring : 20.07.2022 To 21.07.2022
 Time Of Monitoring : 09.15 AM To 08.15 AM (CO&O₃ for 1.0 Hrs.)
 Sample ID No : 1231
 Sampling Done By : ETS STAFF
 Sampling Location : NEAR HOSTEL AREA (WEST CAMPUS)
 Sampling Method : ETS/STP/AIR-01
 Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL
 Weather Condition : CLEAR Ambient Temperature: 34.0 °C
 Wind Direction : E To W
 Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters, (PM ₁₀)	µg/m ³	53.40	For 24 Hrs.=100	IS 5182 (Part-23)
2	Particulate Matters, (PM _{2.5})	µg/m ³	25.70	For 24 Hrs.=60	IS 5182 (Part-24)
3	Sulphur Dioxide, (SO ₂)	µg/m ³	8.10	For 24 Hrs.=80	IS: 5182 (Part-2)
4	Nitrogen Dioxide, (NO ₂)	µg/m ³	18.50	For 24 Hrs.=80	IS: 5182 (Part-8)

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SHRADDHA GUPTA

For Enviro-Tech Services

Pankaj Mittal
Lab In-charge
AUTHORIZED SIGNATORY

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(Prof. S.K. Sharma)
Engineer
Harcourt Butler Technical University
Uttar Pradesh 208002



TEST REPORT

TEST REPORT NO.: ETS/1231/07/2022

DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide (CO)	mgm ³	0.35	For 8 Hrs =2 / For 1 Hrs =4	IS 5182 : Part 10

*****End of Test Report*****

Page 2 of 2



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(Signature)
(Prof. S.K. Sharma)
Envirotech Services
Ghaziabad
U.P. 201001



ETS-LAB

ENVIRO-TECH SERVICES

An Analytical Laboratory

(A GOVERNMENT APPROVED LAB)

(An ISO 9001:2015, 14001:2015 and 45001:2018 Certified Company)

Plot No. 1/32, South Side G.T. Road Industrial Area, Ghaziabad (U.P.) - 201001

email : etslab2012@gmail.com | Website : www.etslab.in | Ph.: 9911516076, 9811736063



TEST REPORT

TEST REPORT NO: ETS/1232/07/2022 URLNO.TC877122000001232F DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

Name And Address of Customer : M/s. HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU),
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002



Date of Monitoring : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Duration Of Monitoring : 20.07.2022 To 21.07.2022
 Time Of Monitoring : 09.30 AM To 08.40 AM (CO&O₂ for 1.0 Hrs.)
 Sample ID No : 1232
 Sampling Done By : ETS STAFF
 Sampling Location : NEAR STAFF QUARTER (WEST CAMPUS)
 Sampling Method : ETS/STP/AIR-01
 Sampling Machine Placed At Height : 1.5 METER FROM GROUND LEVEL
 Weather Condition : CLEAR Ambient Temperature: 34.0 °C
 Wind Direction : E To W
 Equipment Used : Respirable Dust Sampler (PM₁₀) + Fine Particulate Sampler (PM_{2.5})

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
1	Particulate Matters.(PM ₁₀)	µg/m ³	59.50	For 24 Hrs.=100	IS 5182 (Part-23)
2	Particulate Matters.(PM _{2.5})	µg/m ³	29.30	For 24 Hrs.=60	IS 5182 (Part-24)
3	Sulphur Dioxide, (SO ₂)	µg/m ³	9.20	For 24 Hrs.=80	IS: 5182 (Part-2)
4	Nitrogen Dioxide,(NO ₂)	µg/m ³	20.10	For 24 Hrs.=80	IS: 5182 (Part-6)

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SHRADDHA GUPTA



Page 1 of 2

For Enviro-Tech Services

S.K. Sharma
In-charge
AUTHORIZED SIGNATORY

Format No ETS/LAB/TR-01, Issue No. 05, Date 01.04.2019, Amend. No. 04 Date 01.04.2019

(Prof. S.K. Sharma)

Engineer
Harcourt Butler Technical University
Kanpur-208002

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ENVIRO-TECH SERVICES

An Analytical Laboratory

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Plot No. 1/32, South Side G.T. Road Industrial Area, Ghaziabad (U.P.) - 201001

email : etslab2012@gmail.com | Website : www.etslab.in | Ph: 9911516076, 9811736063



TEST REPORT

TEST REPORT NO: ETS/1232/07/2022

DATE OF REPORT: 25.07.2022

AMBIENT AIR MONITORING AND ANALYSIS REPORT

S. No.	Test Parameter	Unit	Result	Specification/Limit (As per CPCB)	Test Method
5	Carbon Monoxide,(CO)	mg/m ³	0.30	For 8 Hrs.=2 / For 1 Hrs.=4	IS 5182 : Part 10

*****End of Test Report*****

Page 2 of 2

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SHRADDHA GUPTA



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(Prof. S.K. Sharma)

Director, Institute of Technical Education
Ghaziabad



TEST REPORT

TEST REPORT NO.: ETS/1233/07/2022

URLNO:TC877122000001233F

DATE OF REPORT: 25.07.2022

WASTE WATER SAMPLE ANALYSIS REPORT

Name And Address of Customer : M/s. HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002

Date of Sampling : 20.07.2022
 Analysis Start Date : 21.07.2022
 Analysis End Date : 25.07.2022
 Sample ID No : 1233
 Sampling Done By : ETS STAFF
 Sampling Description : WASTE WATER
 Sampling Location : FINAL OUTLET DRAIN FOR EAST CAMPUS
 Sampling Method : ETS/STP/WATER-02
 Sample Quantity : 2.0 Ltr.
 Packing Condition : SEALED
 Packed In : P.V.C. CANE



S. No.	Test Parameter	Unit	Result	Specification/Limit (As per G.S.R 422(E))	Test Method
1	pH		7.60	5.5 - 9.0	APHA 4500-H+
2	Total Suspended Solids,(TSS)	mg/L	47.0	100.0	APHA 2540-D
3	Total Dissolved Solids as TDS	mg/L	1015	-	APHA 2540-C
4	Oil & Grease, (O & G)	mg/L	4.6	10.0	APHA 5520-D
5	Biological Oxygen Demand (BOD ₅ @ 27°C)	mg/L	20.5	30.0	IS: 3025 (Part-44)
6	Chemical Oxygen Demand,(COD)	mg/L	110.0	250.0	APHA 5220-B

END OF THE REPORT



Page 1 of 1

For Enviro-Tech Services
(Signature)
Pushkar Mittal
AUTHORIZED SIGNATORY

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(Prof. S.K. Sharma)
Registrar
Harcourt Butler Technical University
Etawah 208002



(A GOVERNMENT APPROVED LAB)

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TEST REPORT NO. : ETS/1234/07/2022

URLNO.TC877122000001234F

DATE OF REPORT : 25.07.2022

WASTE WATER SAMPLE ANALYSIS REPORT

Name And Address of Customer : M/s, HARCOURT BUTLER TECHNICAL UNIVERSITY (HBTU)
NAWABGANJ, DISTT. - KANPUR (U.P.)-208002

Date of Sampling : 20.07.2022
Analysis Start Date : 21.07.2022
Analysis End Date : 25.07.2022
Sample ID No : 1234
Sampling Done By : ETS STAFF
Sampling Description : WASTE WATER
Sampling Location : FINAL OUTLET DRAIN FOR WEST CAMPUS
Sampling Method : ETS/STP/WATER-02
Sample Quantity : 2.0 Ltr.
Packing Condition : SEALED
Packed In : P.V.C. CANE



S. No.	Test Parameter	Unit	Result	Specification/Limit (As per G.S.R 422(E))	Test Method
1	pH	---	7.80	5.5 - 9.0	APHA 4500-H+
2	Total Suspended Solids,(TSS)	mg/L	59.0	100.0	APHA 2540-D
3	Total Dissolved Solids as TDS	mg/L	1120.0	-	APHA 2540-C
4	Oil & Grease, (O & G)	mg/L	6.8	10.0	APHA 5520-D
5	Biological Oxygen Demand (BOD _{5@27°C})	mg/L	29.4	30.0	IS: 3025 (Part-44)
6	Chemical Oxygen Demand,(COD)	mg/L	167.0	250.0	APHA 5220-B

END OF THE REPORT



Page 1 of 1

For Enviro-Tech Services

(Signature)
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Format No ETS/LAB/TR-10, Issue No. 05, Date 01/04/2019, Amd. No. 04 Date 01/04/2019



(Prof. S.K. Sharma)
Engineer
Harcourt Butler Technical University
Etawah-201002

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हरकोर्ट बटलर प्राविधिक विश्वविद्यालय

नवाबगंज, कानपुर - 208002, उ.प्र., भारत

HARCOURT BUTLER TECHNICAL UNIVERSITY

NAWABGANJ, KANPUR - 208002, U.P., INDIA

(Formerly Harcourt Butler Technological Institute, Kanpur)

Phone: +91 912 2531001, 2531812, website: <http://www.hbtu.ac.in>, E-mail: university@hbtu.ac.in

100 YEARS
1921 - 2021

Environmental Performance Evaluation Recognition for HBTU:

A Green Campus Initiation of SPIU-UP under TEQIP-III for Environment Management Framework, conducted an “**Environmental Performance Evaluation**” for the project institutes on 18th September, 2020 through video conference mode by a panel of experts. The online environmental performance review was inaugurated by Prof P M Khodke, CPA, NPIU.

Amongst all the participating institutes, HBTU-Kanpur was found “Third Best Institute” in terms of Environmental Performance, securing 57 marks.

The Parameters for Environmental Performance Evaluation were:

1. Water Conservation
2. Rain Water Harvesting
3. Waste Water Recycling
4. Solid Waste Management
5. Bio-Energy from waste, composting
6. Energy Conservation
7. Solar energy and other alternative renewable energy
8. Plantation Promotion in campus and outside
9. Eco-friendly building material
10. Eco-friendly building plan and design
11. Energy efficient lighting and other energy-based appliances

Panel of experts for the Environmental Performance Evaluation were as follows:

1. **Prof. M A Khalid**, Dean (Welfare), Integral University, U.P.
2. **Prof (Dr.) Jyotsana Pandit**, HOD (AS), Mangalmay Institute of Engineering and Technology, Greater Noida, U.P.
3. **Dr. Kapil Kumar**, Professor (AS), G N Group of Institutions, U.P.



(Prof. S. K. Sharma)
Engineer
Harcourt Butler Technical University
Kanpur-208002



हरकोर्ट बटलर प्राविधिक विश्वविद्यालय

नवाबगंज, कानपुर - 208002, उ.प्र., भारत

HARCOURT BUTLER TECHNICAL UNIVERSITY

NAWABGANJ, KANPUR - 208002, U.P., INDIA


(Formerly Harcourt Butler Technological Institute, Kanpur)

Phone: +91-0512-2534001-5, 2533812, website: <http://www.hbtu.ac.in>, Email: vc@hbtu.ac.in

100 YEARS
1921 - 2021

The details and ranking of institution who participated in the environmental performance evaluation through video conference are as follows:

Name of Institution	Expert-1	Expert-2	Expert-3	Average	Ranking
IET Agra	44	42	37	41	6 th
DEI Agra	81	83	68	77	1 st
BIET Jhansi	53	55	30	46	5 th
HBTU Kanpur	48	74	48	57	3 rd
UPTTI Kanpur	40	44	25	36	9 th
REC Banda	63	71	39	58	2 nd
REC Bijnor	41	43	29	38	8 th
REC Azamgarh	46	47	28	40	7 th
KNIT Sultanpur	54	60	33	49	4 th


Nodal Officer

Dr. Vandana Dixit Kaushik
(HBTU Kanpur)

Nodal Officer Engineering TEQIP-III
Harcourt Butler Technical University
Kanpur-208002


(Prof. S.K. Sharma)
Expert
Harcourt Butler Technical University
Kanpur-208002

8th STATE STEERING COMMITTEE
MEETING

DATE: 29-10-2020 :: Time: 01:00 PM

Virtual mode through Video Conferencing


(Prof. S. K. Sharma)
Incharge
Uttar Pradesh Technical University
Kapurthala

Item No 8.16 | Environment Management Framework**SPIU Brief:****(a) Environmental Performance of Institutions:**

All PIs have the EMP well in place. Last Review meeting was conducted on 31st July 2019 when each of the institutions presented the EMF implementation status in a particular format. DN the day prominent experts of environment from across the country guided the institutions on Green Campus Initiatives.

The EMF was created with the following key objectives:

- Providing a framework for integration of environmental aspects at all stages of project planning, design, execution and operation.
- Enhancing positive environmental impacts of the project and avoid/minimize potential adverse impacts.
- Making environment options available to stakeholders to foster environmental actions, as needed in specific context/situations.

On 31st July, 2019, as part of the Green Campus initiative, detailed deliberations were held finally following were decided as mandate for the institutions to ensure the campus green with following interventions by the interventions, as part of their initiatives for Green Campus:

- ❖ DIRECTOR of every institute has to develop a plan to save energy at the institute level with time bound plan to install 10 KW Solar Power Station mandatorily either at the top of college building or in open field. This will enable the institute to have 24x7 power supply.
- ❖ DIRECTOR of the Institute will phase out the CFL and conventional light source such as bulbs and tube lights, halogen and mercury street/campus lights. These steps will not only save the money but make the institute self-sustainable.
- ❖ Energy audit shall be made mandatory for every institute.
- ❖ Save Energy will be the motto of every day's working in each institute. Every institute will purchase only energy star compliant computers and equipment's. If energy star is unavailable, purchase the most energy-efficient model available in the market.
- ❖ Institute will make all the necessary efforts to involve the students, faculty and staff in "Green Campus Initiatives" by designating the volunteers, printing T-shirts/ Caps with green campus initiative slogan specially designed for the purpose.
- ❖ Various Committee can be constituted consisting of students and teaches for water conservation, energy conservation and audit, waster waste recycling, solid waste management, Green Committee etc.
- ❖ Start "Adopt a Tree Campaign in the institution among the students - particularly among first and second year students).

- ❖ Adopt a village to make it green
- ❖ Awareness campaign in nearby vicinity.

(b) Environmental Performance Evaluation

As part of the Green Campus Initiative (GCI) of SPIU-UP under TEQIP-III mandate for Environment Management Framework (EMF) seeking to reduce environmental degradation that may arrive and to encourage institutions to adopt various environment augmentive measures like rain water harvesting, use of heat reflecting glass, promotion of energy efficient lighting, use of renewable energy etc., *Environmental Performance Evaluation of the project institute was conducted on 18th September, 2020 through video conference mode by a panel of experts, duly constituted for the same.* The Online environmental performance review was inaugurated by Prof P M Khodke, CPA, NPIU.

The Experts for Environmental Performance Evaluation

The experts participated in the review are as under:

1. Prof M A Khalid
Dean, Welfares, Integral University
Head, Deptat of Environmental Science, Integral University, Lucknow
Mob: 7800089633/9818425530; Email: makhalid2007@gmail.com, makhalid@iul.ac.in
2. Prof (Dr) Jyotsana Pandit, HOD (AS), Mangalmay Institute of Engineering & Technology, Greater Noida, UP
Mob: 9412656787; Email: jyotsnapandit4@gmail.com
3. Dr Kapil Kumar, Professor (AS), G N Group of Institutions
Mob: 9811723109; Email: kapiltyagiiec@gmail.com

The Parameters for Environmental Performance Evaluation

Following institutions made the presentations before the expert committee on eleven (11) parameters namely:

1. Water conservation
2. Rain water Harvesting
3. Waste water Recycling
4. Solid Waste Management
5. Bio-Energy from waste, composting
6. Energy Conservation
7. Solar energy and other alternative renewable energy
8. Plantation Promotion in campus and outside
9. Eco-friendly building material
10. Eco-friendly building plan and design



11. Energy efficient lighting and other energy based appliances

The Analysis of Data

Each of the experts reviewed the performance of the institutions who made the presentations against above eleventh(11th) parameters and verified the evidences from the database share by SPIU-UP (as collated from institutions to the google link). The experts submitted their evaluation sheet to the SPIU. The marks provided by the three experts were averaged and final data sheet was made ready. DEI-Agra came out best environmentally performing institute securing 77 marks against total of 100. Rajkiya Engineering College, Banda was found second best environmentally performing institute securing 58 marks and HBTU-Kanpur stood 3rd securing 57 marks. The institutions who participated in the performance evaluation through video conference are detailed in the following table and their ranking in terms of environmental performance.

Environmental Performance Evaluation

Name of Institution	Expert-1	Expert-2	Expert-3	Average	Ranking
IET Agra	44	42	37	41	6th
DEI Agra	81	83	68	77	1st
BIET Jhansi	53	55	30	46	5th
HBTU Kanpur	48	74	48	57	3rd
UPTTI Kanpur	40	44	25	36	9th
REC Banda	63	71	39	58	2nd
REC Bijnor	41	43	29	38	8th
REC Azamgarh	46	47	28	40	7th
KNIT Sultanpur	54	60	33	49	4th

(c) Green Campus Initiatives (GCI)

The SPIU-UP is continuously working on its efforts for Green Activity in the campus with a brand name - Green Campus Initiative (GCI) and is trying to develop an ecosystem and enabling mechanism in the campus where environmental issues are addressed in a systematic and structured manner.

Further efforts are being taken to carry forward the above initiatives and to publish Monograph on "Green Campus Initiatives in Uttar Pradesh", as decided at state steering committee of TEQIP-III/SPIU-UP, a Committee consisting of the following with members/faculty from 1.1 institutions and technical institutions affiliated to I.2/ATU i.e. Dr APJ Abdul Kalam Technical University has been constituted:

1. Dr Anil Kumar, State Project Administrator, SPIU-UP - Chairman

2. Prof. G.S.Sailesh Babu, Deptt of Elect. Engg., DEI Agra - Member
3. Dr Mahima Chaurasia, Asst Professor, IET, RML Avadh University Ayodhya
- Member
4. Dr Shailendra Badal, Head (AS), Rajkiya Engineering College, Banda - Member
5. Prof (Dr) Jyotsana Pandit, HOD (AS), Mangalmai Institute of Engineering & Technology,
Greater Noida, UP - Member
6. Dr Kapil Kumar, Professor (AS), G N Group of Institutions - Member
7. Dr Mahaveer Singh Naruka, Nodal Officer (Academic), SPIU-UP - Convener

The objective is to publish the *Monograph/Book on Green Campus Initiatives* in UP which will document all sound environmental practices being followed by various institutions in UP and select few from outside with an objective to transmit the information to all institution about necessity of addressing all the environmental issues in sound, systematic and sustainable manner, keeping the campus green in every sense.

The best performing institutions against environmental initiatives, namely DEI Agra (1st), REC Banda (2nd) and HBTU Kanpur (3rd) may be recognised by issuance of appreciation letter under signature of Chairman, SSC & Addl. Chief Secretary and SPA.

**Action
required**

The Committee may note and approve.


(Prof. S.K. Sharma)
Engineer
Gangotri Institute of Technology
Roorkee-241002