GURU NANAK GIRLS COLLEGE

GREEN AUDIT REPORT

2022-2023

PREPARED BY
EHS ALLIANCE SERVICES

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CERTIFICATE

EHS alliance

CERTIFICATE

PRESENTED TO

GURU NANAK GIRLS COLLEGE

Santpura, Yamuna Nagar, 135001, Haryana

Has been assessed by EHS Alliance Services for the comprehensive study of environmental impacts on institutional working framework to fulfill the requirement of

GREEN AUDIT

ACADEMIC YEAR 2022-23

The green initiatives carried out by the institution have been verified on the report submitted and was found to be satisfactory.

The efforts taken by the management and the faculty towards environment and sustainability are appreciated and noteworthy.

EHS ALLIANCE SERVICES GURGAON

SIGNATURE

02.12.2023
DATE OF AUDIT

EHS ALLIANCE SERVICES, PLOT A-72, SURYA VIHAR, GURUGRAM, 122001
WWW.EHSALL.IN | BUSINESS@EHSALL.IN | EHSALLIANCE@GMAIL.COM

ACKNOWLEDGEMENT

EHS Alliance Services would like to thank the management of Guru Nanak Girls College for assigning this important work of Green Audit. We appreciate the co-operation to the teams for completion of assessment.

First of all, we would like to thank ***Dr. Harvinder Kaur - Officiating Principal*** for giving us an opportunity to evaluate the environmental performance of the campus.

We would also like to thank ***Dr. Neena Goyal, Associate Professor - Audit Coordinator***, for her continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

Ms. Sandeep Reen *Assistant Professor*

Dr. Mandeep Kaur *Assistant Professor*

Dr. Prabhjot Kaur *Assistant Professor*

DISCLAIMER

EHS Alliance Services Audit Team has prepared this report for Guru Nanak Girls College based on input data submitted by the representatives of college complemented with the best judgment capacity of the expert team.

While all sensible care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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EHS Alliance staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a 'need to know' basis.

Signature

LEAD AUDITOR

CONCEPT AND CONTEXT

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2019–20 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

In view of the NAAC circular regarding Green auditing, the College management decided to conduct an external environment assessment study by a competent external professional auditor. The green audit aims to examine environmental practices within and outside the college campus, which impact directly or indirectly on the atmosphere. Green audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of college environment. It was initiated with the intention of reviewing the efforts within the institutions whose exercises can cause risk to the health of inhabitants and the environment.

Through the green audit, a direction as how to improve the structure of environment and inclusion of several factors that can protect the environment can be commenced. This audit focuses on the Green Campus, Waste Management, Water Management, Air Pollution, Energy Management & Carbon Footprint etc. being implemented by the institution. The concepts, structure, objectives, methodology, tools of analysis, objectives of the audit as below:

INTRODUCTION

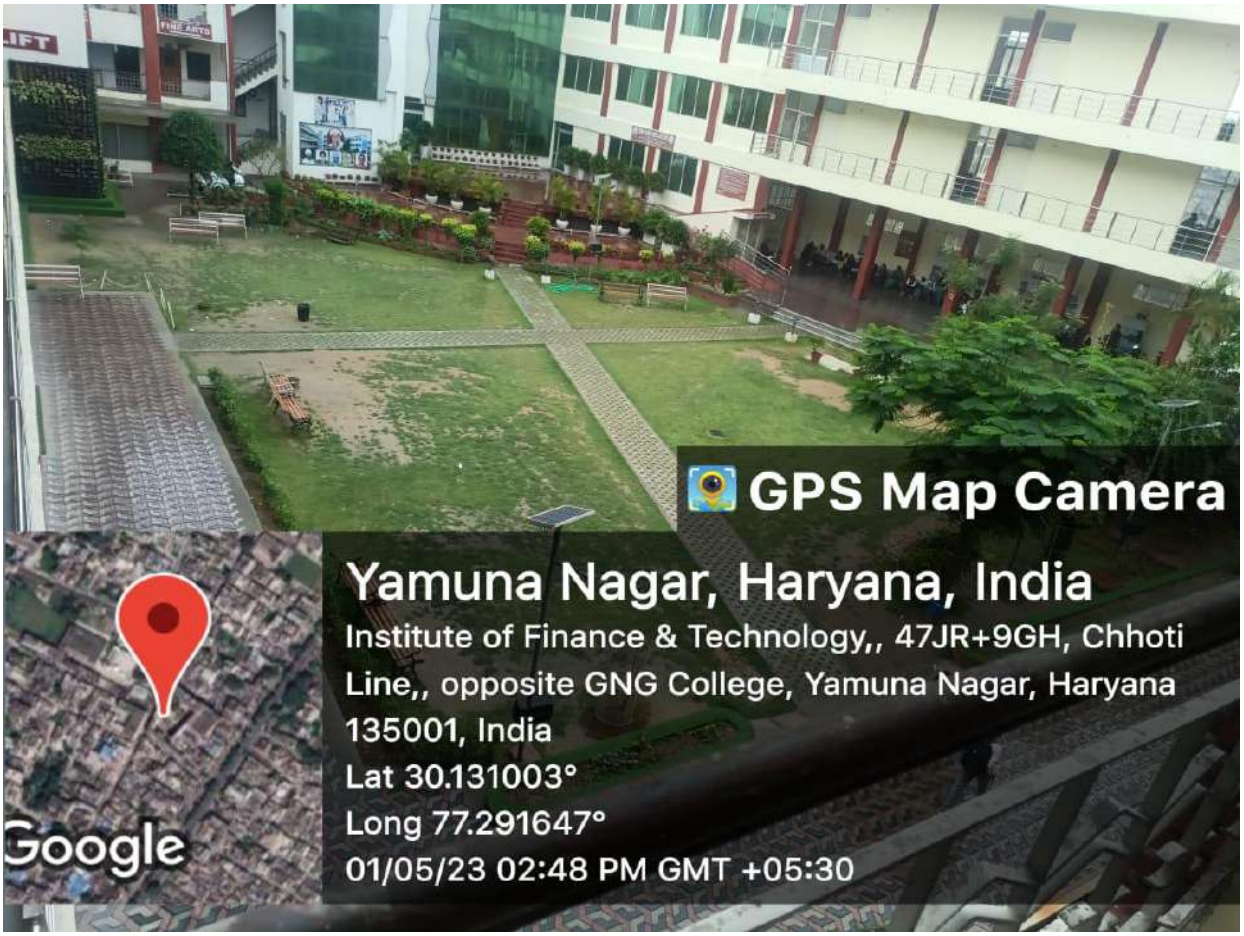
Now a days, the educational institutions are becoming more thoughtful towards the environmental aspects and as a result new and innovative concepts are being introduced to make them sustainable and eco-friendly. To preserve the environment within the institution, a number of viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the saving the energy, waste recycle, water consumption reduction, water harvesting and many more...

The activities carried out by the institution can also create adverse environmental impacts. Green audit is defined as an official inspection of the effects a college has on the environment. Green Audit is conducted to evaluate the actual scenario at the institution campus. Green audit can be a useful tool for a university /college to determine how and where they are using the most of the energy or water or resources; the institution can then decide how to implement changes and make savings. It can also be used to determine the nature and volume of waste, which can be used for a recycling project or to improve waste minimization plan.

Green auditing and the application of mitigation measures is a win-win situation for all the institutions, the learners and the mother earth. It can also result in health awareness and can promote the environmental awareness, values and beliefs. It provides a better understanding to staff and students about the Green impact on institution. Green auditing also upholds financial savings through reduction of resource usage. It gives an opportunity to the students and teachers for the development of ownership of the personal and social responsibility. The audit process involves primary data collection, site walk through with the team of university /college including the assessment of policies, activities, documents and records.

OVERVIEW OF THE COLLEGE

Guru Nanak Girls College, Santpura, Yamunanagar was established in 1973 by the great visionary and philanthropist, Sant Pandit Nischal Singh ji Maharaj. In an era when girls were confined within the barriers of domesticity, Sant ji initiated this noble task of educating them and thereby opening before them new vistas of knowledge and self- sufficiency. Firm on his arduous mission of emancipating women from the shackles which illiteracy force upon them, Sant ji planted this sapling which today has blossomed into a premier multi-faculty postgraduate institution.



The dogged pursuit of excellence and the ardent yearning to achieve the best has led the college to carve an exclusive niche for itself in the state of Haryana. With the highest CGPA score of 3.10 in the district Yamunanagar awarded by NAAC, the college takes pride in being one of the foremost women colleges of the state.

Affiliated to Kurukshetra University, Kurukshetra, the college has consistently been providing quality education in varied streams like Humanities, Science, Commerce, Information Technology, Bio-Technology, Computer Sciences, and Mass Communication & Multimedia. Keeping in view the skill-oriented educational requirements various vocational courses are also offered to the

students There are 39 UG and 14 PG courses out of which courses like BSc Multimedia, Clinical Nutrition & Dietician and M. Sc. Food & Nutrition, Clothing & Textile and Human Development are available exclusively in the college.

The college also holds remedial classes for weak students and special classes for preparing students for various competitive exams. Keeping pace with today's technology driven world the college has introduced smart class room teaching. A blend of traditional teaching methodology with audio-visual aids and student seminars has made learning very interesting for students. The college has fully furnished rooms, an air-conditioned auditorium, well equipped laboratories, a well stacked & computerized library, fully computerized administrative block, a well-furnished seminar room with audio-visual facilities, a gymnasium, canteen and common room with LCDs. The college has four hostels- two within the campus and two nearby the campus- to accommodate the students from far flung areas. In an attempt to pay tribute and celebrate the stature of women, these hostels have been named after the four great women of Sikh history. The college has a fleet of eleven buses which are available to the students within a radius of 50 kms. Sant ji had started this bus service with an alm of removing the major obstacle of conveyance which rural girl students suffer from. Campus II of the college is at a walking distance from the main building and is adorned with an audio-video equipped conference hall and a gymnasium.

VISION & VALUES

VISION

- ✓ With a very specific objective of imparting education to girls, the college has many courses which increase job prospects and are also within the reach of weaker sections of the society. The top Management, the Principal and the staff keep themselves abreast with the current needs of the society.
- ✓ Bus facilities are provided to the girls coming from rural areas within the radius of 50 Kms.
- ✓ Students are provided with different types of scholarships so that they are able to continue their studies.
- ✓ Teachers visit rural areas to motivate the students to pursue higher education after 10+2
- ✓ Intimation about traditional as well as highly demanded courses

Traditions and Value Orientations of the Institution

- ✓ Our founder Sant Pandit Nischal Singh Ji Maharaj laid emphasis on keeping the students rooted to their culture and moral values. To fulfill his dream, we have developed following practices which inculcate the value system and nurture in the young minds the healthy traditions of Indian society.
- ✓ Respect for all the religions
- ✓ The college has maintained a large number of books on various religions and faiths and encourages the students to read them. Such practice would inculcate in then the feelings of religious tolerance and brotherhood of mankind
- ✓ Morning assembly is a daily routine in the college.
- ✓ The college has its premises Gurudwara Sahib which is open to all
- ✓ From time to time the college organizes seminars and invites various religious scholars to present their views
- ✓ Regular evening seminars on Divinity are held in college which are attended by the staff and the students of the college and their sister concerns.

- ✓ Celebration of Prakash Utsav of Guru Ramdas Ji followed by Guru ka Langar and celebration of cultural festivals like Lohri, Teej, Basant Utsav etc. is a regular practice.

- ✓ The college follows the teachings of the great Guru and visionary Guru Nanak Dev Ji who propagated "Satbat Da Bhala & Ek Pita Ekas Ke Hum Baarik ".

Geo Location
Geo Coordinates from Google maps:
30.130913, 77.291964

AUDIT PARTICIPANTS

On behalf of Guru Nanak Girls College

Name	Designation
Dr. Harvinder Kaur	*Officiating Principal*
Dr. Neena Goyal	*Associate Professor*
Dr. Mandeep Kaur	*Assistant Professor*
Dr. Prabhjot Kaur	*Assistant Professor*
Ms. Sandeep Reen	*Assistant Professor*
Ms. Poonam Saini	*Assistant Professor*
Ms. Charu Panwar	*Assistant Professor*
Ms. Ramanjot Kaur	*Assistant Professor*
Mrs. Monika Chopra	*Assistant Professor*

On behalf of EHS Alliance Services

Name	Position	Qualifications
Dr. Uday Pratap	Lead Auditor	*Ph.D., PDIS, QCI – WASH, Lead Auditor ISO 14001:2015*
Ms. Pooja Kaushik	Co-Auditor	*M.Sc., Field Expert, PGCCC, QCI – WASH*

EXECUTIVE SUMMARY

Green auditing is an essential step to identify and determine whether the institutional practices are sustainable and ecological. Traditionally, we were upright and efficient users of natural resources. But over the period of time, excessive usage of resources like water, electricity, petrol, etc. have become habitual for everyone especially, in urban and semi-urban areas. It is actually the right time to check if we (our process) are consuming more than required resources? Whether we are using resources sensibly?

Green audit standardizes all such practices and provides an efficient way to use natural resources. In the time of climate change and resource exhaustion it is necessary to re-check the processes and convert then in to green and sustainable. Green audit provides an approach for the same. It also increases overall awareness among the folks working in the institution towards the eco-friendly environment.

This is the first attempt to conduct green audit of this campus for fulfilment of NAAC criteria. This audit was mainly focused on greening indicators like consumption of energy in terms of electricity and fossil fuel, quality of soil, water usage, vegetation, waste management practices and carbon foot print of the campus. Initially a questionnaire was shared to know about the existing resources of the campus and resource consumption pattern of the students and staff in the campus.

GREEN AUDIT - ANALYSIS

1.1 GENERAL INFORMATION

1. Does any Green Audit conducted earlier?

No, this is the first external audit organized by the College

2. What is the total strength (people count) of the Institute?

Students
Male: 0 Female: 3000 Total: 3000
Teachers (including guest faculty)
Male: 1 Female: 112 Total: 113
Non-Teaching Staff
Male: 58 Female: 31 Total: 89
Total Strength
Male: 59 Female: 3143 Total: 3202

3. What is the total number of working days of your campus in a year?

There are two hundred and eighty-two working days in a year.

4. Where is the campus located?

The campus is located in Santpura, Yamuna Nagar, Haryana 135106

5. Which of the following are available in your institute?

Garden area	*Available*
Playground	*Available*
Kitchen	*Available*
Toilets	*Available*
Garbage Or Waste Store Yard	*Not Available*
Laboratory	*Available*
Canteen	*Available*
Hostel Facility	*Available*
Guest House	*Not Available*

6. Which of the following are found near your institute?

Municipal dump yard	*Not in vicinity of institute*
Garbage heap	*No Garbage heaps*
Public convenience	*Public convenience is available*
Sewer line	*Approximately 1.0 KM sewer line within campus*
Stagnant water	*No stagnant water*
Open drainage	*No*
Industry – (Mention the type)	*No*
Bus / Railway Station	*Roadways bus stand and Yamuna nagar railway station*
Market / Shopping complex	*Available*

1.2 WASTE MINIMIZATION AND RECYCLING

1. Does your institute generate any waste? If so, what are they?

Yes, Solid waste, Canteen waste, paper, plastic, horticulture, laboratory waste, e-waste, etc.

2. What is the approximate amount of waste generated per day? (in Kg approx.)

Biodegradable waste - 20 Kg
Non-biodegradable waste -3 Kg
Hazardous Waste - 1 Kg
Others < 1 Kg

3. How is the waste managed in the institute? By Composting, Recycling, Reusing, Others (specify)

Guru Nanak Girls College is using composting for solid waste management, water harvesting pits are there for water conservation, STP/ETP is fully operational for wastewater treatment. Lab waste is managed through a dilution process.

4. Do you use recycled paper in the institute?

No

5. How would you spread the message of recycling to others in the community?

College is spreading awareness about recycling through different activities and campaigns to students, staff and local nearby villages

6. Can you achieve zero garbage in your institute? If yes, how?

Not yet achieved.

1.3 GREENING THE CAMPUS

1. Is there a garden in your institute?

Yes, about 12000 sq. ft areas are developed as Gardens.

2. Do students spend time in the garden?

Yes, students spend around 1-2 Hours during winters.

3. Total number of Plants in Campus?

Plant type with approx. count	
Full grown Trees	*27*
Small Trees	*51*
Hedge Plants	*1728*
Grass Cover sqm	*12000 sq. ft*

Below are details of Navgrah Vatika

Botanical Name	Common Name	Family	Direction	Representing Planet
Calotropis procera	*Akra*	*Apocynaceae*	*Center*	*Sun*
Ficus racemosa	*Gular*	*Moraceae*	*East*	*Venus*
Achyranthes aspera	*apamarg*	*Amaranthaceae*	*North*	*Mercury*
Acacia catechu	*Khair*	*Fabaceae*	*South*	*Mars*
Prosopis cineraria	*Shami*	*Fabaceae*	*West*	*Saturn*
Butea monosperma	*Dhak ,Plash*	*Fabaceae*	*South east*	*Moon*
Ficus religiosa	*Peepal*	*Moraceae*	*North East*	*Jupiter*
Imperata cylindrica	*Darbha grass*	*Poaceae*	*North west*	*Ketu*
Cynodon dactylon	*Durva*	*Poaceae*	*South west*	*Rahu*

4. Is the College campus having a Horticulture Department? (If yes, give details)

Yes, 3 staff (maali) deployed in the horticulture team

5. How many Tree Plantation Drives are organized by campus per annum?

Plantation Drive is carried out occasionally.
Survival rate is more than 75%.

6. Is there any Plant Distribution Program for Students and Community?

Yes

8. Is there any Plant Ownership Program?

No

1.4 WATER AND WASTEWATER MANAGEMENT

1. List uses of water in your institute

Basic use of water in campus:

Drinking – 77.04 KL/month

Gardening – 25.08 Kl/month

Kitchen and Toilets – 608.06 KL/month

Others – 229.48 KL/month

Hostel – 183.60 KL/Month

Total = 1123.27 KL/Month

2. How does your institute store water? Are there any water-saving techniques followed in your institute?

The college stores water in underground and overhead tanks.

Saving Techniques

- *Avoid overflow of water-controlled valves are provided in water supply system.*
- *Close supervision for the water supply system.*

3. Locate the point of entry of water and point of exit of wastewater in your institute.

Entry *- Water comes from the borewell*
Exit*- From the Canteen, Toilets, Hostel, bathrooms, and Labs through covered drainage which is connected to the sewage treatment Plant*

4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

- *Close the taps after usage*
- *Water Conservation awareness for new students*
- *Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage*

1.5 ANIMAL WELFARE

1. List the animals (wild and domestic) found on the campus (dogs, cats, squirrels, birds, insects, etc.)

3 dogs, 3 Cats, 20+ butterfly species, 10+ Squirrels, 4-5 monkeys, and 40+ Birds are found in campus. A variety of bird species and other flora and fauna are available, so the institute is doing their bit for biodiversity conservation.

2. Does your institute have a Biodiversity Program or a KARUNA CLUB?

*Yes, Guru Nanak Girls College's **Eco Club** actively organizes awareness through various campaigns and activities including seminars, poster competitions, etc.*

1.6 CARBON FOOTPRINT - EMISSION & ABSORPTION

1. Electricity used per year - CO2 emission from Electricity

(electricity used per year in kWh/1000) x 0.84
242276 kWh/1000 x 0.84
= 203.51 tons

2. LPG/PNG used per year - CO2 emission from LPG/PNG

(LPG/PNG used per year in KG) x 2.99
=4728.60 x 2.99
=12.67 tons

3. Diesel used per year CO2 emission from HDS (Diesel)

(Diesel used per year in litres) x 2.68
= 3450 x 2.68
=10.32 tons

4. Transportation per year (car) CO2 emission from transportation (Bus and Car)

There are 12 college-owned vehicles, 10 bus, and 2 cars
*=(10*2*2*282/100)*0.01 + (2*4*2*282/100)*0.02*
=1.13 + 0.90
=2.03 tons

Total CO2 emission per year is 228.53 tons

After considering carbon absorption capacity of campus, the total carbon emission is 226.81 tons

CARBON ABSORPTION BY FLORA IN THE INSTITUTION

There are 27 full-grown trees and 51 semi-grown trees of different species, on the campus spread over 12000 sq ft.

The carbon absorption capacity of one full-grown tree 22 kg CO_2 Therefore Carbon absorption capacity of 27 full-grown trees 27 x 22 kg CO_2 = 0.59 tons of CO_2.

The carbon absorption capacity of 51 semi-grown trees is approx. 30% of that of full-grown trees. Hence the carbon absorption 51 x 6.8 kg of Co2 = 0.35 tons of CO_2

There are approximately Hedge Plants 1728 of various species being raised in the gardens and grown in areas where no buildings are built Carbon absorption of bush plants varies widely with their species. Certain bushes absorb very high levels of CO_2 whereas some others absorb very low levels of CO_2. In the absence of a detailed scientific study, 200g of CO_2, absorption is taken per bush (in consultation with Environmental Science specialists). Based on this, the total carbon absorption of bushes is 1728 x 200 g = 0.35 tons of CO_2

The lawns on the campus have buffalo grass, Mexican grass, and indigenous grass species and cover a total area of 12000 sq. ft. Carbon absorption capacity of a 10 sq. ft. area of lawn is 1 g per day Therefore, carbon absorption by lawn area 12000 x 365 x 0.1 g CO_2 = 0.44 tons CO_2 per year.

The total of carbon absorption capacity of the campus is 1.72 tons.

GREEN INITIATIVES

- The institution uses composting techniques for organic solid waste management.
- There is a ban on single-use plastic and plastic crockery in the campus.
- The college has a separate storeroom for the safe storage of electronic waste. After a certain interval of time college disposes of the E-waste to concerned agencies through the auction process.
- The college has rainwater harvesting pits for rainwater storage and better groundwater recharge.
- The college has installed small scale solar panels and solar lights are also used for street lights.
- Personal Vehicles (Students) are not allowed in the campus
- The Swachhta Action Plan (SAP) Committee conducted a workshop on the Campus Nursery Initiative from May 26 to June 04, 2022.

- Plantation drive was conducted in village Tejli by SAP Committee staff and Student members in collaboration with Unnat Bharat Abhiyaan Team of the college.

- The college celebrated World Environment Day on 3rd and 4th June, 2022.The two days program also included discussions and suggestions from the students on the topic of Mother Earth which was explained with the help of models. Posters and charts were displayed with the aim of creating awareness about various environmental issues.

- A Roof Gardening Workshop was conducted by Department of Chemistry, Social Sciences and SAP Committee in association with the "Ek Soch Nai Soch" NGO. The procedure and benefits of Roof Gardening were explained to the students

RECOMMENDATIONS

- Green building guidelines for future expansion projects of the campus.

- Environmental parameters shall be included in purchase policy to achieve a cradle to grave approach for sustainability.

- Increase in Environmental promotional activities for spreading awareness at the campus.

- To eliminate the spillage and over usage of water in washbasins, urinals and toilet push taps are highly recommended.

- Enhance recycling. This can be done by creating a group where students can recycle books, personal clothes and other materials for needy students. This can be an initiative under the green program.

- Regular workshops related to Plastic free campus, plantation drives, 3R implementation, e-waste collection, menstrual hygiene, etc. should be carried out

- Messages should be displayed at various locations to Aware People about Energy Savings

CONCLUSION

This audit involves considerable team discussions and meetings with key staff members on a variety of environmental-related topics. The eco club of Guru Nanak Girls College promotes conservation of resources.

Overall, 40% of Guru Nanak Girls College is for landscaping. The college makes a significant effort to act in an environmentally responsible manner and takes into account the environmental effects of the majority of its activities. The recommendations in this report suggests some more ways in which the college can work to improve its practices and develop into a more sustainable institution.

It's important to begin a few things, such as initiating sprinklers for irrigation and a conservation awareness message display at different locations on campus. Additionally, we strongly advise increasing awareness amongst the students, staff, and local societies for the 3R principle and conservation of water and energy.

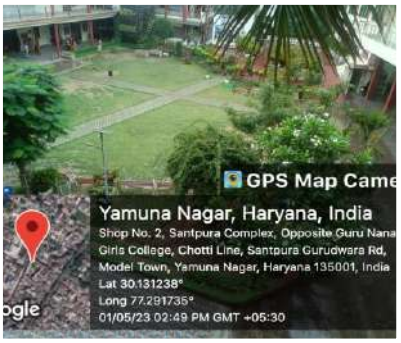
REFERENCE

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

ANNEXURE –ENVIRONMENT CONSCIOUSNESS PHOTOS

Modern building structure

Well maintained college campus



Lush green campus

Posters for awareness

Library

Smart Classes

Well equiped labs

Auditorium

Classroom

Hostel

Solar Water heater

STP/ETP

Tree plantataion

Plantation drive

Cleanliness drive

Unnat Bharat Abhiyan

Solar PV

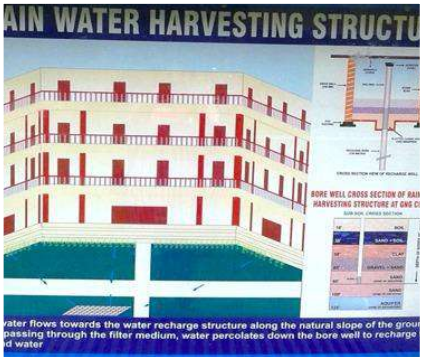
Awareness campaign in villages

Cleanliness drive

Awareness drive

Plantation drive at Tijli village school

E-vehicle in campus



Rainwater harvesting drawing

Awareness seminar

तारीख / Date 28/08/2021
ज्ञापन संख्या / Memo no: MOE/Swachhta Action Plan/2020-21/August 21/024/252

सत्यमेव जयते

भारत सरकार / Government of India
महात्मा गांधी राष्ट्रीय ग्रामीण शिक्षा परिषद / Mahatma Gandhi National Council of Rural Education
उच्च शिक्षा विभाग/Department of Higher Education
शिक्षा मंत्रालय / Ministry of Education

Where there is Rural Wellbeing there is Universal Prosperity

District Green Champion Certificate

This is to certify that **Guru Nanak Girls College, Yamunanagar** is hereby recognized as **District Green Champion** for **Yamunanagar** District for the Academic Year 2020-21. The Institution has successfully set up the Swachhta Action Plan Committee, adopted and implemented best practices in the areas of Sanitation, Hygiene, Waste Management, Water Management, Energy Management and Greenery Management.

This certificate is given in the presence of **Vice Chancellor Prof. Samar Singh, Maharana Pratap Horticultural University, Karnal, Haryana.**

AUGUST 2021

Dr W G Prasanna Kumar
Chairman
MGNCRE, Ministry of Education
Government of India

********** END OF THE REPORT **********

GURU NANAK GIRLS COLLEGE

ENVIRONMENT AUDIT REPORT

2022-2023

PREPARED BY
EHS ALLIANCE SERVICES

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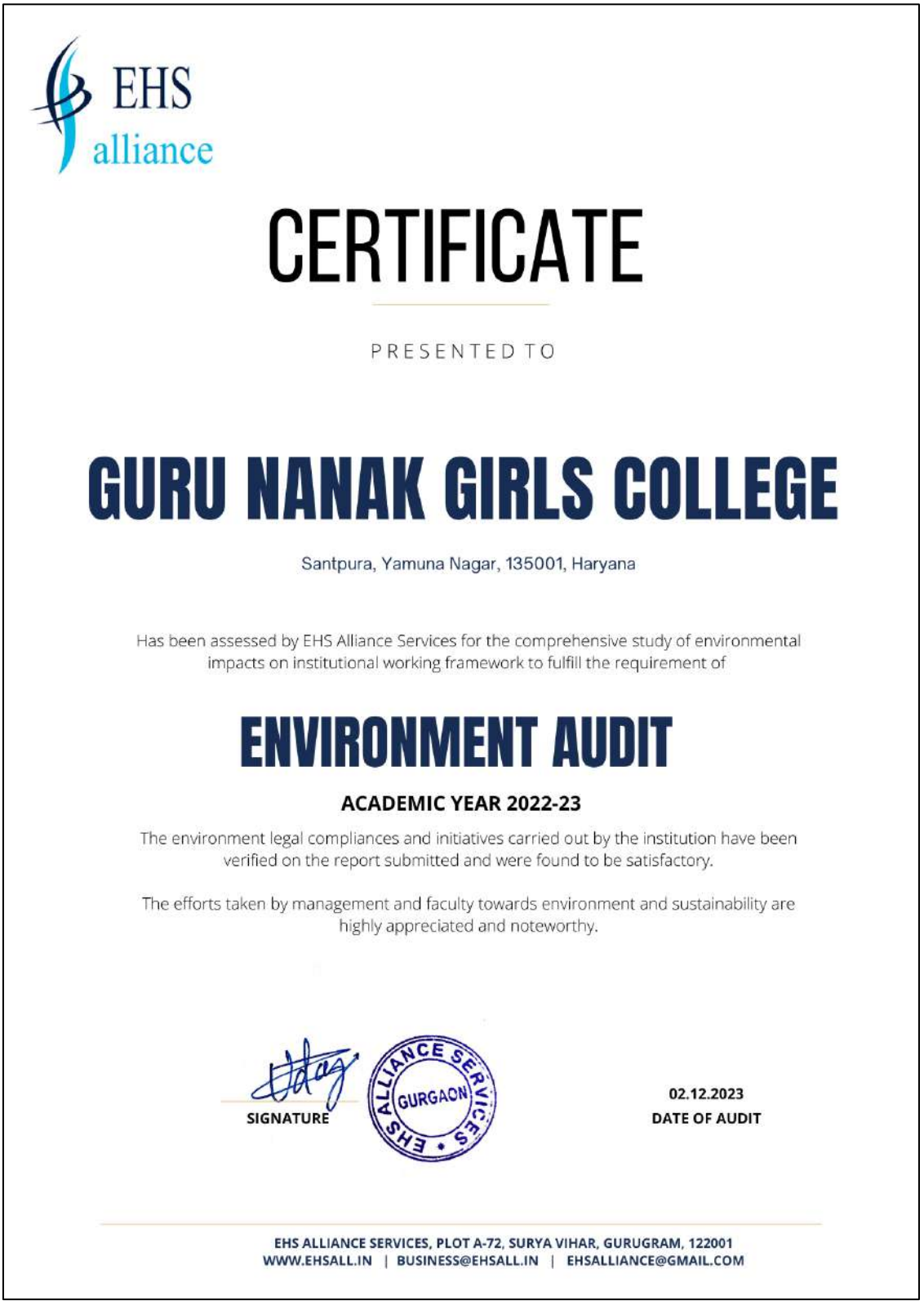
AUDIT CERTIFICATE



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Signature

LEAD AUDITOR

CONCEPT AND CONTEXT

In India, the process for environmental audit was first mentioned under the Environment Protection Act, 1986 by the Ministry of Environment of forests on 13th march, 1992. As per this act, every person owning an industry or performing an operation or process needs a legal consent and must submit an environmental report or statement.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2019–20 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the sustainable environment.

In view of the NAAC circular regarding environment auditing, the College management decided to conduct an external environment assessment study by a competent external professional auditor.

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

The ICC defines Environmental Auditing as:

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

This audit focuses on the environment legal compliances and implementation of rules defined by MoEFCC or state pollution control board. The concepts, structure, objectives, methodology, tools of analysis, and objectives of the audit are discussed below.

INTRODUCTION

Nature is very precious gift for all life forms. Disturbance in the nature causes environmental Problems. These are increasing day by day as a result of development of urbanization and industrialization on earth. Because of unplanned utilization of resources, our planet is facing tremendous pressure results a sharp rise in temperature. Therefore, there is an urgent need to plan the consumption of the resources in sustainable manner in order to conserve natural resources for future generation.

Sustainable development is becoming popular in the world for saving the earth. Utilizing resources in judicially can save the earth's precious resources. Measurement of environmental components is the most effective step to conserve and protect natural resources.

Environmental auditing had begun in the early 1970s with provision of civil lawsuits for non-compliance with environmental regulations. Environment auditing involves on site visit, collection of samples, performing analyses, and report results to competent authorities.

Industry, the corporate world is initiating auditing for saving natural resources. Academic institutions also can contribute to the preservation and conservation of resources within their premises.

In thin "Environment Audit" report would help everyone to think about preserving resources, show willingness to learn their importance, adopt steps to minimize resource use and set an example for others to follow the path of eco-friendly practices to achieve the goal of sustainable development. Effective implementation of environmental auditing helps in minimization of environmental risks at low cost.

OVERVIEW OF THE COLLEGE

Guru Nanak Girls College, Santpura, Yamunanagar was established in 1973 by the great visionary and philanthropist, Sant Pandit Nischal Singh ji Maharaj. In an era when girls were confined within the barriers of domesticity, Sant ji initiated this noble task of educating them and thereby opening before them new vistas of knowledge and self- sufficiency. Firm on his arduous mission of emancipating women from the shackles which illiteracy force upon them, Sant ji planted this sapling which today has blossomed into a premier multi-faculty postgraduate institution.

The dogged pursuit of excellence and the ardent yearning to achieve the best has led the college to carve an exclusive niche for itself in the state of Haryana. With the highest CGPA score of 3.10 in the district Yamunanagar awarded by NAAC, the college takes pride in being one of the foremost women colleges of the state.

Affiliated to Kurukshetra University, Kurukshetra, the college has consistently been providing quality education in varied streams like Humanities, Science, Commerce, Information Technology, Bio-

Technology, Computer Sciences, and Mass Communication & Multimedia. Keeping in view the skill-oriented educational requirements various vocational courses are also offered to the students There are 39 UG and 14 PG courses out of which courses like BSc Multimedia, Clinical Nutrition & Dietician and M.Sc Food & Nutrition, Clothing & Textile and Human Development are available exclusively in our college.

The college also holds remedial classes for weak students and special classes for preparing students for various competitive exams. Keeping pace with today's technology driven world the college has introduced smart class room teaching. A blend of traditional teaching methodology with audio-visual aids and student seminars has made learning very interesting for students. The college has fully furnished rooms, an air conditioned auditorium, well equipped laboratories, a well stacked & computerized library, fully computerized administrative block, a well-furnished seminar room with audio-visual facilities, a gymnasium, canteen and common room with LCDs. The college has four hostels- two within the campus and two nearby the campus- to accommodate the students from far flung areas. In an attempt to pay tribute and celebrate the stature of women, these hostels have been named after the four great women of Sikh history. The college has a fleet of eleven buses which are available to the students within a radius of 50 kms. Sant ji had started this bus service with an alm of removing the major obstacle of conveyance which rural girl students suffer from. Campus II of the college is at a walking distance from the main building and is adorned with an audio-video equipped conference hall and a gymnasium.

VISION & VALUES

VISION

- ✓ With a very specific objective of imparting education to girls, the college has many courses which increase job prospects and are also within the reach of weaker sections of the society. The top Management, the Principal and the staff keep themselves abreast with the current needs of the society.
- ✓ Bus facilities are provided to the girls coming from rural areas within the radius of 50 Kms.
- ✓ Students are provided with different types of scholarships so that they are able to continue their studies.
- ✓ Teachers visit rural areas to motivate the students to pursue higher education after 10+2
- ✓ Intimation about traditional as well as highly demanded courses

Traditions and Value Orientations of the Institution

- ✓ Our founder Sant Pandit Nischal Singh Ji Maharaj laid emphasis on keeping the students rooted to their culture and moral values. To fulfill his dream, we have developed following practices which inculcate the value system and nurture in the young minds the healthy traditions of Indian society.
- ✓ Respect for all the religions.
- ✓ The college has maintained a large number of books on various religions and faiths and encourages the students to read them. Such practice would inculcate in then the feelings of religious tolerance and brotherhood of mankind.
- ✓ Morning assembly is a daily routine in the college.
- ✓ The college has in its premises Gurudwara Sahib which is open to all.
- ✓ From time to time the college organizes seminars and invites various religious scholars to present their views.

- ✓ Regular evening seminars on Divinity are held in college which are attended by the staff and the students of the college and their sister concerns.
- ✓ Celebration of Prakash Utsav of Guru Ramdas Ji followed by Guru ka Langar and celebration of cultural festivals like Lohri, Teej, Basant Utsav etc. is a regular practice.
- ✓ The college follows the teachings of the great Guru and visionary Guru Nanak Dev Ji who propagated "Satbat Da Bhala & Ek Pita Ekas Ke Hum Baarik ".

Geo Location

Geo Coordinates from Google maps:
30.130913, 77.291964

AUDIT PARTICIPANTS

On behalf of Guru Nanak Girls College

Name	Designation
Dr. Harvinder Kaur	*Officiating Principal*
Dr. Neena Goyal	*Associate Professor*
Dr. Mandeep Kaur	*Assistant Professor*
Dr. Prabhjot Kaur	*Assistant Professor*
Ms. Sandeep Reen	*Assistant Professor*
Ms. Poonam Saini	*Assistant Professor*
Ms. Charu Panwar	*Assistant Professor*
Ms. Ramanjot Kaur	*Assistant Professor*
Mrs. Monika Chopra	*Assistant Professor*

On behalf of EHS Alliance Services

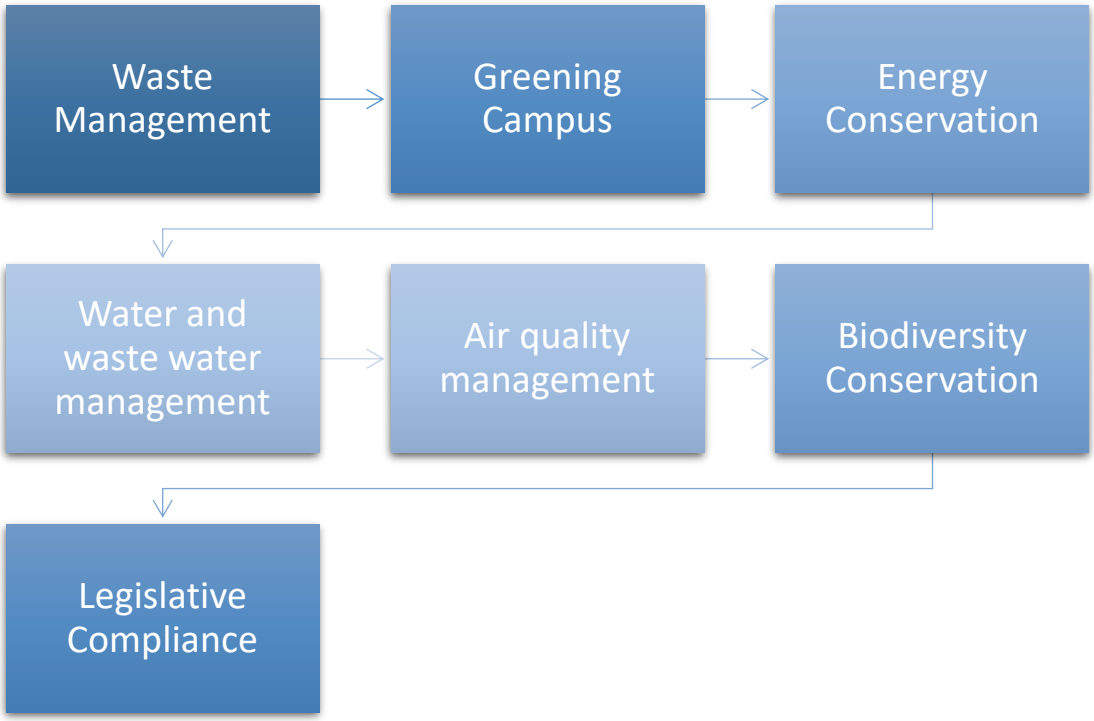
Name	Position	Qualifications
Dr. Uday Pratap	Lead Auditor	*Ph.D., PDIS, QCI – WASH, Lead Auditor ISO 14001:2015*
Ms. Pooja Kaushik	Co-Auditor	*M.Sc., Field Expert, PGCCC, QCI – WASH*

EXECUTIVE SUMMARY

The environment audit is a snapshot in time, in which one assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes out-dated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. Our approach to promote a Green Campus to inculcate the sustainable value systems among the students, so that they carry the learning and practices them in their future endeavours. This will ensure that Sustainability and Environmental practices get embedded in all the institutions and organizations in the country.

A Green Campus is a place where environmentally friendly practices and education combine to promote sustainability in the campus which ultimately offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental, social and economic needs of mankind.

This is very first environmental audit of College for doing their bit towards environmental protection and environmental awareness at local and global front. Audit criterion is environmental cognizance, waste minimization and management, biodiversity conservation, water conservation, energy conservation and environmental legislative compliance by the campus. A questionnaire is used during audit. This audit report contains observations and recommendations for the improvement of environmental consciousness.



WASTE MANAGEMENT

TYPES OF WASTE ON COLLEGE CAMPUS

To create effective waste management plans, Colleges first need to know the types of waste they produce. Below, we have compiled a list of various kinds of waste commonly generated on institutional campuses:

1. **Food Waste** - The college campus generates food waste. The average mess and canteen generate approximately 10 kg of food waste a day. The reasons for food waste on an educational campus may be over-purchasing food to ensure a sufficient supply and then throwing it away, especially in the canteen/cafeteria where plentiful stores are essential. And in the cafeteria, students may pile food onto their ample trays, find it unappealing once they sit down and dutifully scrape it into the garbage. Immediate attention is given to the food waste minimization techniques.

2. **Recyclable Paper, Cardboard, Plastic, Glass and Cans** -Campus tends to produce vast quantities of these recyclables. Even in the digital age, many students, professors and staff members still prefer handwritten notes and end up with piles of unwanted paper once their courses and projects are complete. The snacks so essential for socializing tend to come in recyclable plastic, glass or aluminum containers. And shipments of necessary items throughout the year are likely to arrive in recyclable plastic and cardboard packaging. The same is sold/auctioned to the scrap vendors time to time.

3. **Student Clothes and Housewares** - As we have mentioned above, many students find it more convenient to throw away their clothes and dorm furnishings at the end of the year than donate or recycle them.

4. **E – Waste - Student and facility electronics often form a large portion of a campus's waste** — As campus continually upgrade their computing facilities and office computers to keep up with the latest technology, the old computers have to go somewhere. Same is the case with old printers, phones, copy machines and other electronics that receive upgrades over the years. Discarded student electronics often become part of a college's waste stream as well. Students may throw away old phones, TVs, tablets, laptops and printers, along with cords and other accessories. Recycling is a much more eco-friendly option — the metals in old electronics often have a high reuse value. The college has tie-up with external authorized agency details mentioned in legislation compliances.

5. **Maintenance Waste -** In the maintenance department, spent paints, solvents, adhesives and lubricants all form potentially hazardous waste. Because they are difficult to recycle, spent incandescent light bulbs usually become landfill waste. Spent fluorescent light bulbs, which contain small amounts of mercury, typically require special handling because of the environmental and health risks they pose.

6. **Furniture** - Furniture waste on a college campus has a couple of different sources. The campus itself may also get rid of old furniture as it modernizes its classrooms, cafeterias, computer labs and study spaces. Annually sold to a junk dealer.

7. **Books/Magazines/Newspapers -** Books accounted for solid waste generation and Colleges often generate tons of textbook waste. As courses upgrade to new editions, they may end up throwing their newly obsolete textbooks into the garbage if donation programs cannot use them. Students of GURU NANAK GIRLS COLLEGE donate their textbooks and notes to junior students, or else are auctioned to resellers.

8. **C & D Waste -** Expansion of college campus building and renovation works result significant amount of construction and demolition waste that should be either used for backfilling or disposed-off through an authorized dumping site by CPCB/SPCB.

9. **Solid Waste -** The College is managing solid waste by providing it to the Municipal corporation/ PHED..

ENERGY CONSERVATION

1. **List ten ways that you use energy in your institute. (Electricity, LPG, firewood, others). Using this list, try to think of ways that you could use less energy every day.**

- *Using Energy efficient appliances*
- *Switching off the electrical equipment when not in use*
- *Use of Air conditioners at optimum temperatures as per the utilization schedule*
- *LED lights*

2. **Are there any energy saving methods employed in your institute? If yes, please specify. If no, suggest some**

Yes, Guru Nanak Girls College has adopted energy saving techniques

- *LEDs installed*
- *Use of Air conditioners at optimum temperatures as per the class timetable*
- *Car pooling*
- *Solar panels installed*

3. **How many CFL/LED bulbs has your institute installed?**

Guru Nanak Girls College has replaced almost 70% of the conventional bulbs and tube lights with LED Lights.

4. **Do you run "switch off" drills at institute?**

Yes

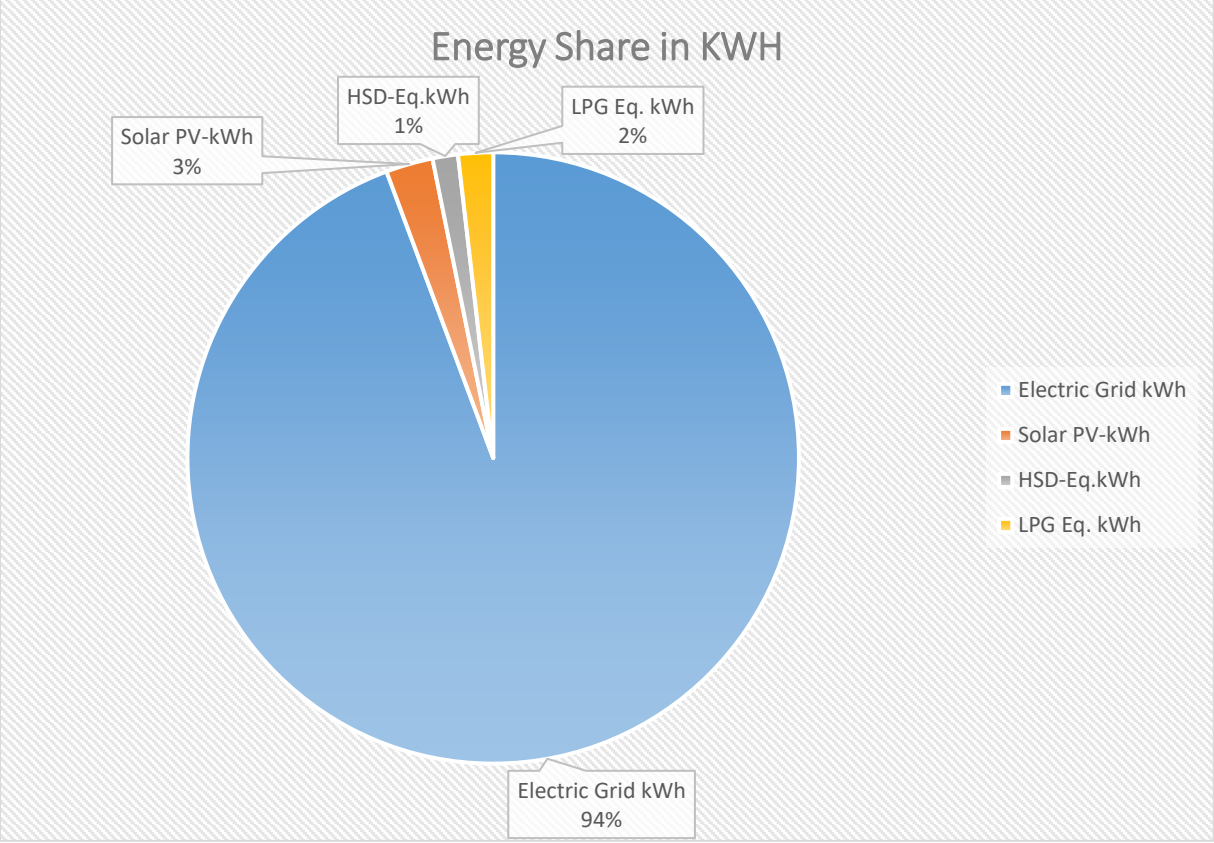
5. **Are your computers and other equipment's put on power-saving mode?**

Yes, Guru Nanak Girls College put the equipment on power saving mode

6. **Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby modes most of the time? If yes, how many hours?**

Yes, approximately 3-4 hours

Energy Share	kWh	Percentage (%)
Electric Grid kWh	242276	94.33%
Solar PV-kWh	6393	2.49%
HSD-Eq. kWh	3450	1.34%
LPG Eq. kWh	4729	1.84%
Total -kWh	256848	100%



WATER AND WASTEWATER MANAGEMENT

1. List uses of water in your institute

Basic use of water in campus:

Drinking – 77.04 KL/month

Gardening – 25.08 Kl/month

Kitchen and Toilets – 608.06 KL/month

Others – 229.48 KL/month

Hostel – 183.60 KL/Month

Total = 1123.27 KL/Month

2 How does your institute store water? Are there any water saving techniques followed in your institute?

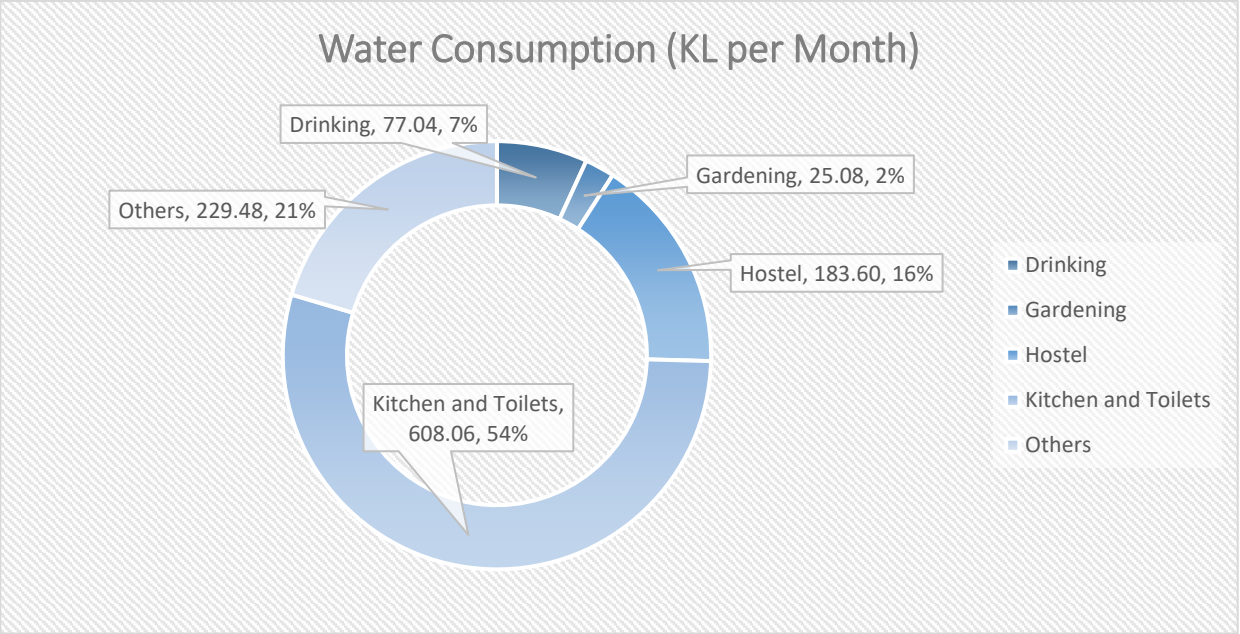
College stores water in underground and overhead tanks.

Saving Techniques
Avoid overflow of water-controlled valves are provided in water supply system.
Close supervision for water supply system.

3. Locate the point of entry of water and point of exit of waste water in your institute. (Entry and Exit)

Entry - Water comes from Borewell.

Exit- From Canteen, Toilets, Hostel and bathrooms through covered drainage which is connected to sewage treatment plant.



4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

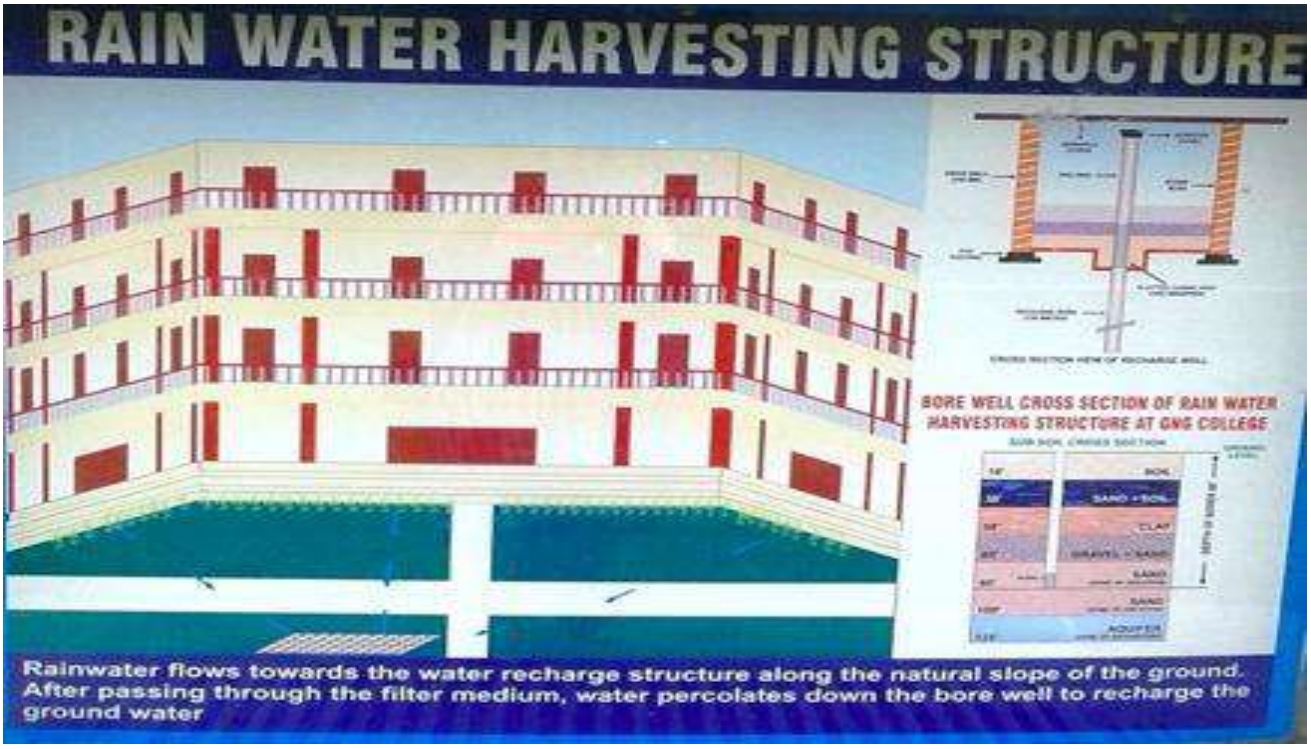
- *Close the taps after usage*
- *Water Conservation awareness for new students*
- *Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage*

5. Does your institute harvest rainwater?

Yes

6. Is there any water recycling System?

Yes



AIR QUALITY MANAGEMENT

1. Are the Rooms in Campus Well Ventilated?

Yes, as per National Building Code, guidelines

2. Window Floor ratio of the Rooms?

Very Good, ample daylight utilization because of big windows.

3. What is the ownership of the vehicles used by your campus?

Guru Nanak Girls College owns 13 vehicles

4. Provide details of college-owned vehicles?

Details of college-owned vehicles	*Buses*	*Cars*	*Vans*	*E-Rikshaw*	*Total*
No. of vehicles	*10*	*2*	*0*	*1*	*13*

5. PUC done?

Yes

6. Specify the type of fuel used by your campus's vehicles

10 Bus – Diesel
2 Car – Petrol

8. Air Quality Monitoring Program (If, Any)

No monitoring is being done

ENVIRONMENT LEGISLATIVE COMPLIANCE

1. Are you aware of any environmental Laws Pertaining to different aspects of environmental management?

Yes

2. Does your institute have any rules to protect the environment? List possible Rules you could include.

Yes, the eco club of Guru Nanak Girls College is conscious about the environmental protection and takes proper measures in terms of awareness campaigns, activities, webinar, seminars, etc.

3. Does Environmental Ambient Air Quality Monitoring conducted by the Institute?

No

4. Does Environmental Water and Waste water Quality monitoring conducted by the Institute?

No

5. Does stack monitoring of DG sets conducted by the Institute?

No

6. Is any warning notice, letter issued by state government bodies?

No

7. Does any Hazardous waste generated by the Institute?

No

GENERAL INFORMATION

1. Does your institute have any rules to protect the environment? List possible rules you could include.

Yes, Guru Nanak Girls College eco cub carries out various programs for environment protection periodically on the campus.

2. Are students and faculties aware of environmental cleanliness ways? If Yes Explain

Yes, college organizes various activities for environment cleanliness

- *Reduce carbon footprints by opting energy saving methods and using public commutes.*
- *Recycling of waste products*
- *Avoid single use plastic*
- *Less use of paper*

3. Does Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?

Yes, World Environment Day, Ozone Day, Earth Day, and more are celebrated by campus. Furthermore, Guru Nanak Girls College organizes different activities like plantation drives, zero waste management drives, roof gardening workshops, and many more.

4. Does Institute participate in National and Local Environmental Protection Movement?

Yes, college actively participates in MGNCRE initiatives.

5. Does Institute have any Recognition or certification for environment friendliness?

Yes, attached in annexure 1

7. Does Institution conduct a green or environmental audit of its campus?

This is the first external audit carried out by the College.

8. Has the institution been audited /accredited by any other agency such as NABL, NABET, TQPM, NAAC etc.?

Yes, College is accredited as NAAC grade A rated college

BEST PRACTICES

- The institution uses composting technique for organic solid waste management.
- There is ban on single use plastic and plastic crockery in the campus.
- College has a separate storeroom for the safe storage of electronic waste. After a certain interval of time college disposes of the E-waste to concerned agencies through the auction process.
- The college has a rainwater harvesting pits for rainwater storage and better groundwater recharge.
- The college is in process to install solar panels (100 kWp) and solar lights are also used for street lights.
- Personal Vehicles (Students) are not allowed in the campus
- Swachhta Action Plan (SAP) Committee conducted a workshop on Campus Nursery Initiative from May 26 to June 04, 2022.
- Plantation drive was conducted in village Tejli by SAP Committee staff and Student members in collaboration with Unnat Bharat Abhiyaan Team of the college.
- The college celebrated World Environment Day on 3rd and 4th June, 2022.The two-day program also included discussions and suggestions from the students on the topic of Mother Earth which was explained with the help of models. Posters and charts were displayed with the aim of creating awareness about various environmental issues.
- A Roof Gardening Workshop was conducted by Department of Chemistry, Social Sciences and SAP Committee in association with the “Ek Soch Nai Soch” NGO. The procedure and benefits of Roof Gardening were explained to the students

RECOMMENDATIONS

- Provide sanitary waste disposal facility as per the CPCB guidelines for management of sanitary waste (as per Solid Waste Management Rules, 2016). Installation of Incinerator is recommended in campus

- Green building guidelines with ECBC compliance should be adopted for future expansion projects of the College.

- Environmental Monitoring i.e. (Ambient Air Quality monitoring, Stack Monitoring of DG sets, Water monitoring need to be conducted by State Pollution Control Committee, approved laboratory) should be conducted periodically.

- The college should sign agreements with third-party authorized vendors instead of giving scrap to different vendors for different types of waste management, such as paper recycling, e-waste, BMW, Plastic waste, etc.

- Eco-friendly parameters should be included in the purchase of articles and goods for the campus.

- The college should run conservation awareness campaigns like online sessions and webinars for students and staff.

CONCLUSION

This audit involved extensive consultation with all the campus team, interactions with key personnel on a wide range of issues related to Environmental aspects. Guru Nanak Girls College has an eco-club for sustainable use of resources.

The audit has identified some observations for making the campus premise more environmental friendly. The recommendations are also mentioned with observations for the college campus team to initiate actions. The audit team opines that the overall site is well maintained from an environmental perspective. A few things that are important to initiate urgently are a waste management plan and an agreement with third-party authorized vendors for waste management.

REFERENCES

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

ANNEXURE I - CERTIFICATES

तारीख / Date 28/08/2021
ज्ञापन संख्या / Memo no: MOE/Swachhta Action Plan/2020-21/August 21/024/252

सत्यमेव जयते

भारत सरकार / Government of India
महात्मा गांधी राष्ट्रीय ग्रामीण शिक्षा परिषद / Mahatma Gandhi National Council of Rural Education
उच्च शिक्षा विभाग/Department of Higher Education
शिक्षा मंत्रालय / Ministry of Education

Where there is Rural Wellbeing there is Universal Prosperity

District Green Champion Certificate

This is to certify that **Guru Nanak Girls College, Yamunanagar** is hereby recognized as **District Green Champion** for **Yamunanagar** District for the Academic Year 2020-21. The Institution has successfully set up the Swachhta Action Plan Committee, adopted and implemented best practices in the areas of Sanitation, Hygiene, Waste Management, Water Management, Energy Management and Greenery Management.

This certificate is given in the presence of **Vice Chancellor Prof. Samar Singh, Maharana Pratap Horticultural University, Karnal, Haryana.**

AUGUST 2021

Dr W G Prasanna Kumar
Chairman
MGNCRE, Ministry of Education
Government of India


राष्ट्रीय मूल्यांकन एवं प्रत्यायन परिषद
NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

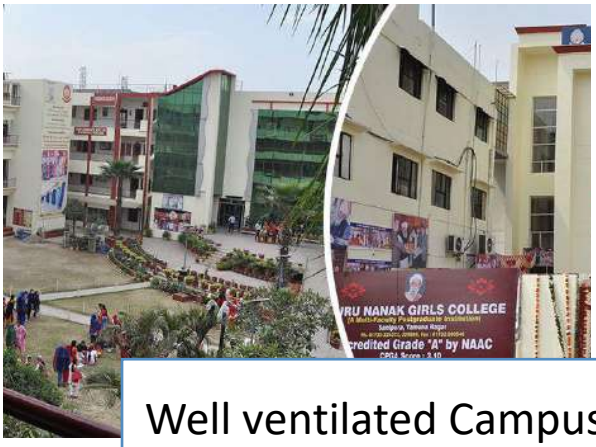
Certificate of Accreditation

The Executive Committee of the
National Assessment and Accreditation Council
on the recommendation of the duly appointed
Peer Team is pleased to declare the
Guru Nanak Girls College
Santpura, Yamuna Nagar, affiliated to Kurukshetra University, Haryana as
Accredited
with CGPA of 3.10 on four point scale
at A grade
valid up to February 18, 2021

Date : February 19, 2016

Director

ANNEXURE II - PHOTOGRAPHS



Well ventilated Campus

Well maintained Campus

Classrooms

Well equiped labs

Pantation drive

World Environment Day Celebration

Electric vehicle to redure carbon emissions

Water treatment system workshop

Cleanliness drive

Solar PV installed on roof

Cleanliness drive

Zero waste management drive

Awareness Session

Awareness program in nearby govt. school

Poster activity

Awareness activity

Carbon Zero initiative

Awareness lecure for faculty and students

********** **END OF THE REPORT** **********

GURU NANAK GIRLS COLLEGE

ENERGY AUDIT REPORT

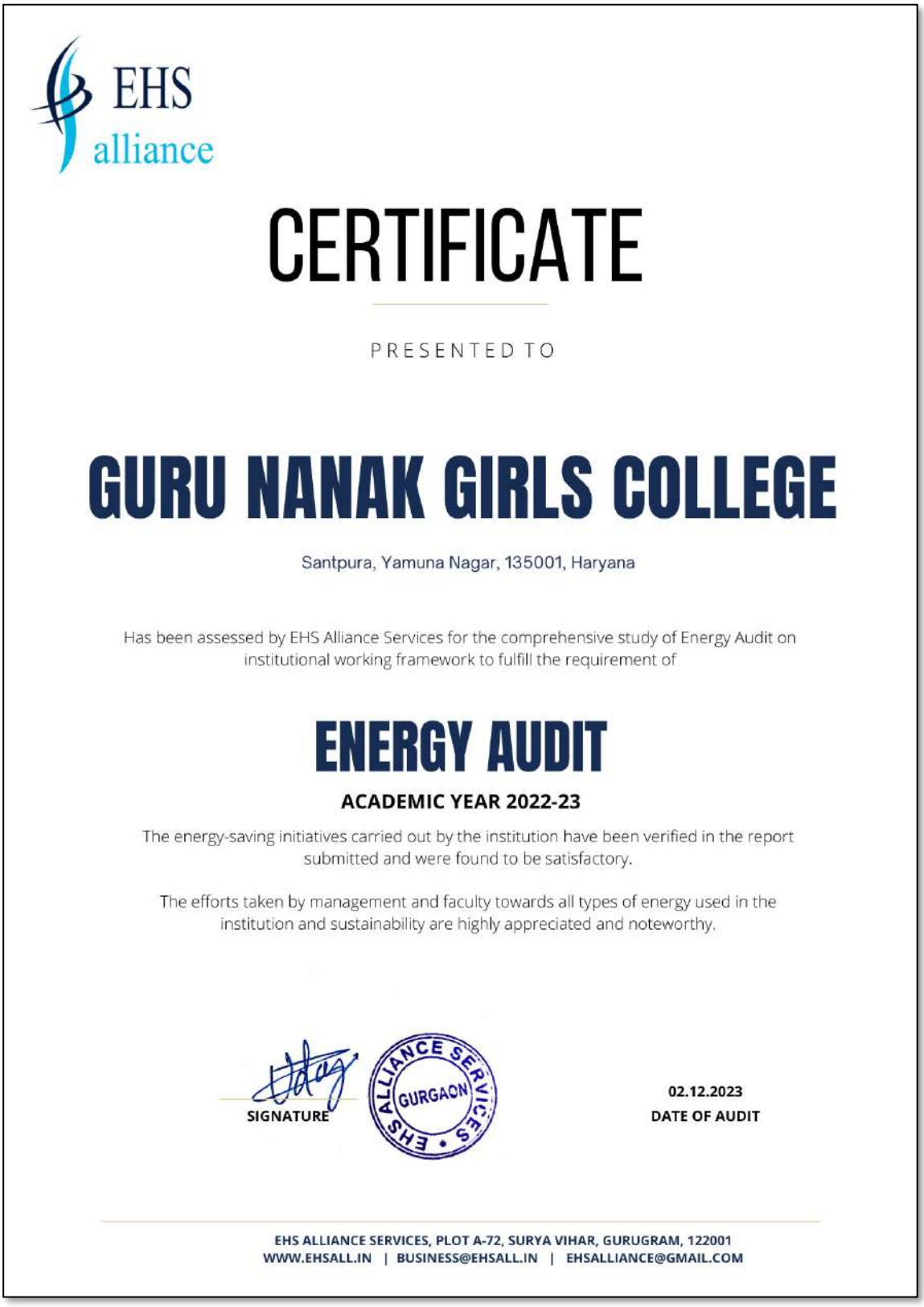
2022-2023

PREPARED BY

EHS ALLIANCE SERVICES

Contents

CERTIFICATE



EHS alliance

CERTIFICATE

PRESENTED TO

GURU NANAK GIRLS COLLEGE

Santpura, Yamuna Nagar, 135001, Haryana

Has been assessed by EHS Alliance Services for the comprehensive study of Energy Audit on institutional working framework to fulfill the requirement of

ENERGY AUDIT

ACADEMIC YEAR 2022-23

The energy-saving initiatives carried out by the institution have been verified in the report submitted and were found to be satisfactory.

The efforts taken by management and faculty towards all types of energy used in the institution and sustainability are highly appreciated and noteworthy.

SIGNATURE

EHS ALLIANCE SERVICES GURGAON

02.12.2023
DATE OF AUDIT

EHS ALLIANCE SERVICES, PLOT A-72, SURYA VIHAR, GURUGRAM, 122001
WWW.EHSALL.IN | BUSINESS@EHSALL.IN | EHSALLIANCE@GMAIL.COM

ACKNOWLEDGEMENT

EHS Alliance Services would like to thank the management of Guru Nanak Girls College for assigning this important work of Energy Audit. We appreciate the co-operation to the teams for completion of assessment.

First of all, we would like to thank ***Dr. Harvinder Kaur - Officiating Principal***, for giving us an opportunity to evaluate the environmental performance of the campus.

We would also like to thank ***Dr. Neena Goyal, Associate Professor - Audit Coordinator***, for her continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

Ms. Sandeep Reen ***Assistant Professor***

Dr. Mandeep Kaur ***Assistant Professor***

Dr. Prabhjot Kaur ***Assistant Professor***

DISCLAIMER

EHS Alliance Services Energy Audit Team has prepared this Energy Audit Report for Guru Nanak Girls College based on input data submitted by the representatives of the college complemented with the best judgment capacity of the expert team.

While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on the information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

If you wish to distribute copies of this report external to your organization, then all pages must be included.

EHS Alliance, its staff and agents shall keep confidential all information relating to your organization and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies. EHS Alliance staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a 'need to know' basis.

EHS ALLIANCE SERVICES GURGAON

Vijay Singh
Lead Auditor EMS & Energy

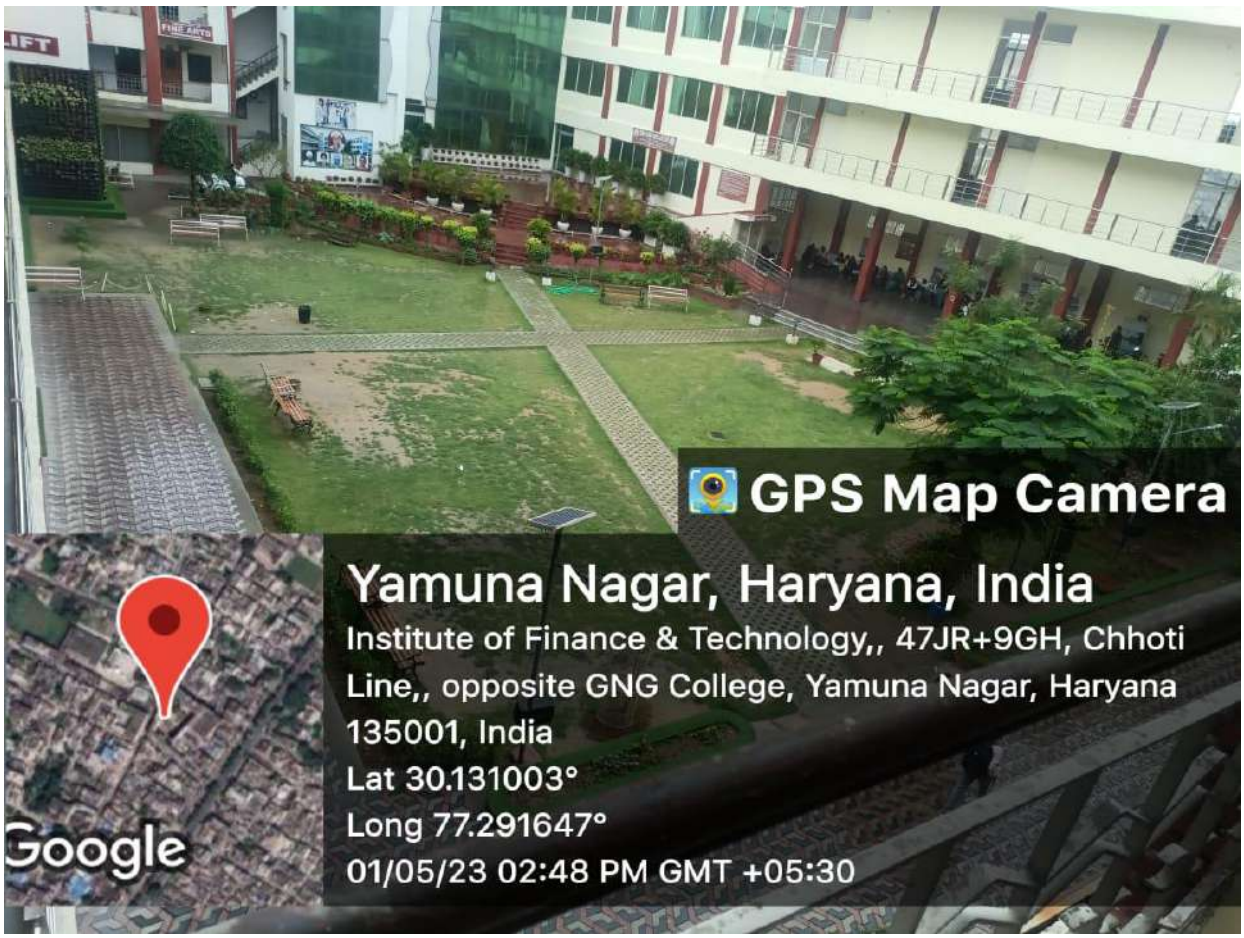
Dr. Uday Pratap
Co-Auditor EMS & Energy

ABBREVIATION

A	**Amps**
AC	**Air Conditioner**
AC	**Alternating Current**
AMET	**Academy of Maritime Education and Training**
CFL	**Compact fluorescent lamp**
CIP	**Comprehensive Inspection Programme**
DC	**Direct Current**
HSD	**High Speed Diesel**
Hz	**Hertz**
kg	**Kilogram**
kVA	**kilo-volt-ampere**
kW	**kilo Watts**
kWh	**kilowatt hour**
kWp	**Kilowatt peak**
LED	**Light Emitting Diode**
LPG	**Liquefied Petroleum Gas**
MMS	**Module mounting structure**
MPPT	**Maximum Power Point Tracker**
NAAC	**The National Assessment and Accreditation Council**
SEC	**Specific Energy Consumption**
SPV	**Solar Photovoltaic**
STC	**Standard Test Condition**
TV	**Television**
V	**Volts**
W	**Watts**
W/m2	**Watt Per Square Metre**

OVERVIEW OF THE COLLEGE

Guru Nanak Girls College, Santpura, Yamunanagar was established in 1973 by the great visionary and philanthropist, Sant Pandit Nischal Singh ji Maharaj. In an era when girls were confined within the barriers of domesticity, Sant ji initiated this noble task of educating them and thereby opening before them new vistas of knowledge and self-sufficiency. Firm on his arduous mission of emancipating women from the shackles that illiteracy force upon them, Sant ji planted this sapling which today has blossomed into a premier multi-faculty postgraduate institution.



The dogged pursuit of excellence and the ardent yearning to achieve the best has led the college to carve an exclusive niche for itself in the state of Haryana. With the highest CGPA score of 3.10 in the district Yamunanagar awarded by NAAC, the college takes pride in being one of the foremost women colleges of the state.

Affiliated to Kurukshetra University, Kurukshetra, the college has consistently been providing quality education in varied streams like Humanities, Science, Commerce, Information

Technology, Bio-Technology, Computer Sciences, and Mass Communication & Multimedia. Keeping in view the skill-oriented educational requirements various vocational courses are also offered to the students There are 39 UG and 14 PG courses out of which courses like BSc Multimedia, Clinical Nutrition & Dietician and M.Sc. Food & Nutrition, Clothing & Textile and Human Development are available exclusively in the college.

The college also holds remedial classes for weak students and special classes for preparing students for various competitive exams. Keeping pace with today's technology-driven world the college has introduced smart classroom teaching. A blend of traditional teaching methodology with audio-visual aids and student seminars has made learning very interesting for students. The college has fully furnished rooms, an air-conditioned auditorium, well-equipped laboratories, a well-stacked & computerized library, fully computerized administrative block, a well-furnished seminar room with audio-visual facilities, a gymnasium, canteen and a common room with LCDs. The college has four hostels- two within the campus and two nearby the campus- to accommodate students from far-flung areas. In an attempt to pay tribute and celebrate the stature of women, these hostels have been named after the four great women of Sikh history. The college has a fleet of eleven buses which are available to the students within a radius of 50 kms. Sant ji had started this bus service with an alm of removing the major obstacle of conveyance which rural girl students suffer from. Campus II of the college is at walking distance from the main building and is adorned with an audio-video equipped conference hall and a gymnasium.

VISION & VALUES

VISION

- ✓ With a very specific objective of imparting education to girls, the college has many courses which increase job prospects and are also within the reach of weaker sections of the society. The top Management, the Principal and the staff keep themselves abreast with the current needs of the society.
- ✓ Bus facilities are provided to the girls coming from rural areas within the radius of 50 Kms.
- ✓ Students are provided with different types of scholarships so that they are able to continue their studies.
- ✓ Teachers visit rural areas to motivate the students to pursue higher education after 10+2
- ✓ Intimation about traditional as well as highly demanded courses

Traditions and Value Orientations of the Institution

- ✓ Our founder Sant Pandit Nischal Singh Ji Maharaj laid emphasis on keeping the students rooted to their culture and moral values. To fulfill his dream, we have developed following practices which inculcate the value system and nurture in the young minds the healthy traditions of Indian society.
- ✓ Respect for all the religions
- ✓ The college has maintained a large number of books on various religions and faiths and encourages the students to read them. Such practice would inculcate in then the feelings of religious tolerance and brotherhood of mankind
- ✓ Morning assembly is a daily routine in the college.
- ✓ The college has its premises Gurudwara Sahib which is open to all
- ✓ From time to time the college organizes seminars and invites various religious scholars to present their views
- ✓ Regular evening seminars on Divinity are held in college which are attended by the staff and the students of the college and their sister concerns.
- ✓ Celebration of Prakash Utsav of Guru Ramdas Ji followed by Guru ka Langar and celebration of cultural festivals like Lohri, Teej, Basant Utsav etc. is a regular practice.
- ✓ The college follows the teachings of the great Guru and visionary Guru Nanak Dev Ji who propagated "Satbat Da Bhala & Ek Pita Ekas Ke Hum Baarik ".

Geo Location
Geo Coordinates from Google maps:
30.130913, 77.291964

AUDIT PARTICIPANTS

On behalf of the college

Name	Designation
Dr. Harvinder Kaur	*Officiating Principal*
Dr. Neena Goyal	*Associate Professor*
Dr. Mandeep Kaur	*Assistant Professor*
Dr. Prabhjot Kaur	*Assistant Professor*
Ms. Sandeep Reen	*Assistant Professor*
Ms. Poonam Saini	*Assistant Professor*
Ms. Charu Panwar	*Assistant Professor*
Ms. Ramanjot Kaur	*Assistant Professor*
Mrs. Monika Chopra	*Assistant Professor*

On behalf of EHS Alliance Services

Name	Position	Qualifications
Mr. Vijay Singh	Lead Auditor	*M.Sc. M. Tech (Environment Science & Engineering), Energy Auditor, Post Diploma in Industrial Safety Management*
Dr. Uday Pratap	Co-Auditor	*Ph.D., EMS: Lead Auditor ISO14001:2015, QCI–WASH*

EXECUTIVE SUMMARY

The purpose of this Energy Audit was to seek opportunities to improve the energy efficiency of the Guru Nanak Girls College. Reducing energy consumption despite improving human comfort, health and safety were of primary concern.

Beyond just identifying the energy consumption pattern, this audit sought to detect and categorize the most energy-efficient appliances. Additionally, some daily practices relating to common appliances have been shared which may help reduce energy consumption. Data collection for the energy audit of the campus was carried out by the EHS Alliance Team. The Energy Audit Report accounts for the energy consumption patterns of the institution on actual surveys and detailed analysis during the audit.

The work comprehends the area-wise consumption traced using suitable equipment. The analysis was carried out by our team with the support of the staff members from Guru Nanak Girls College. The report provides a list of possible actions to preserve and efficiently access the available sources, and resources and their saving potential was also identified. We look forward to optimization so that the authorities, students, and staff members will follow the recommendations in the best possible way. The report is based on certain generalizations including the approximations wherever necessary. The views conveyed may not reveal the general opinion. They merely represent the opinion of the team guided by the interviews of clients. We are happy to submit this Energy audit report to the Guru Nanak Girls College.

ENERGY AUDIT - ANALYSIS

1. ENERGY CONSUMPTION

To understand the Energy Consumption trends and for analyzing the average monthly consumption we have collected electricity energy bills from July 2022 to June 2023

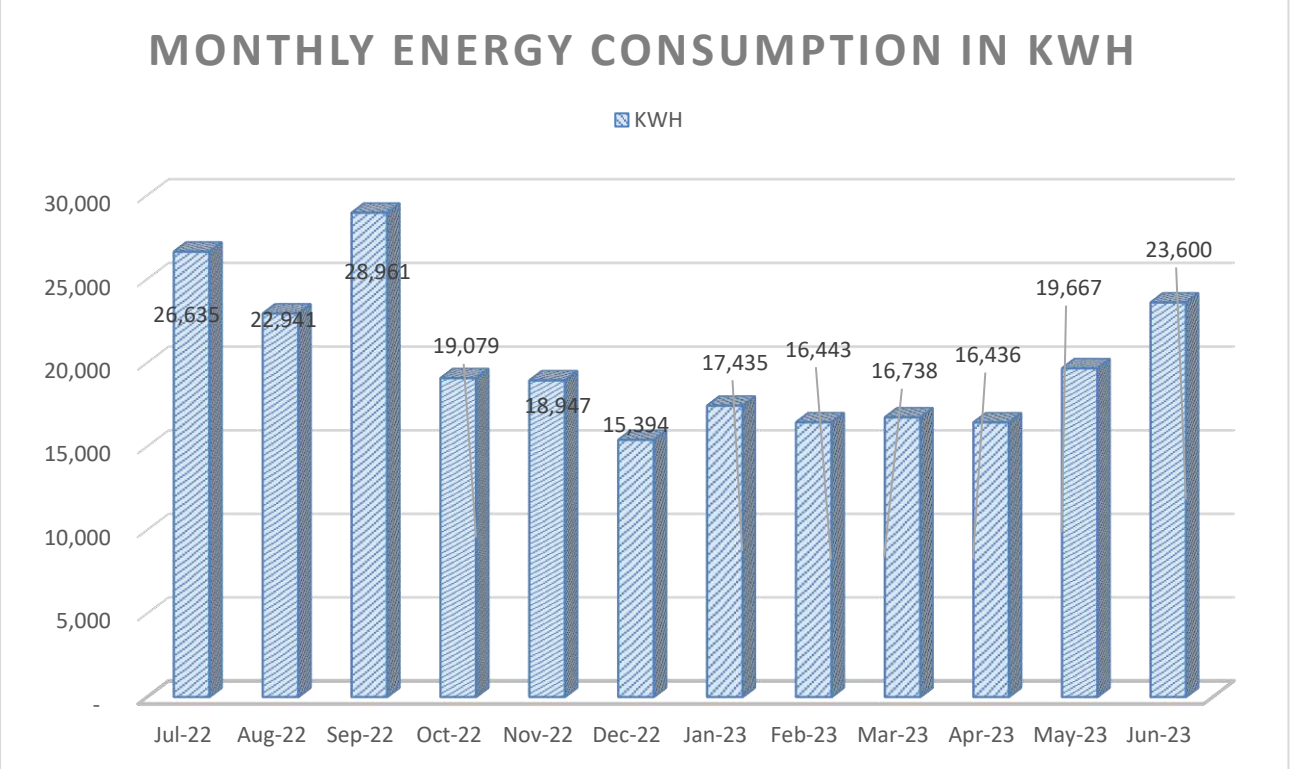
The details of **"Meter Connection"** at **"Guru Nanak Girls College"** are as follows-

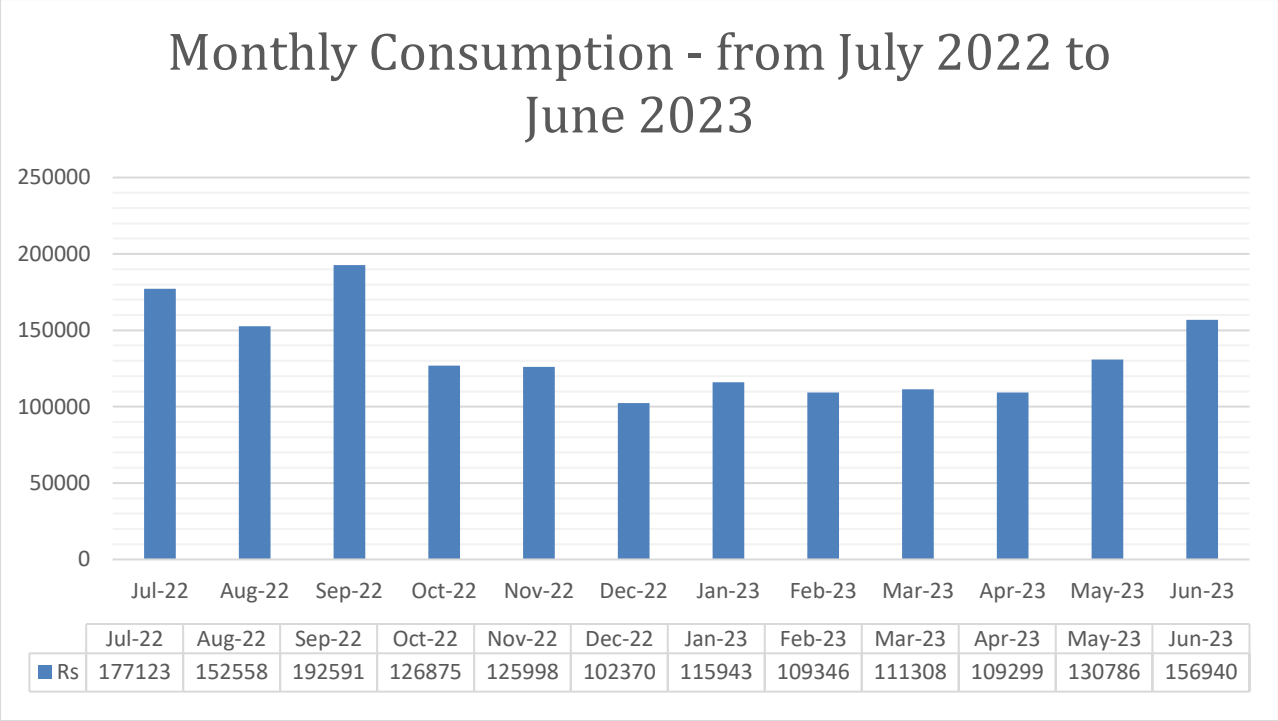
Name	-	Guru Nanak Girls College
CA No.	-	1566870000

1.1 Summary of Monthly Electricity Consumption and Total Bill Amount

To understand the Energy consumption trend and for developing the baseline parameter we have collected monthly energy bill for the 12 months i.e. from July 2022 to June 2023

Month	Grid Billing	Solar PV	Rate INR	Amount in INR
Jul-22	26635	1,003	6.65	1,77,122.75
Aug-22	22941	339	6.65	1,52,557.65
Sep-22	28961	1,106	6.65	1,92,590.65
Oct-22	19079	471	6.65	1,26,875.35
Nov-22	18947	723	6.65	1,25,997.55
Dec-22	15394	397	6.65	1,02,370.10
Jan-23	17435	393	6.65	1,15,942.75
Feb-23	16443	319	6.65	1,09,345.95
Mar-23	16738	669	6.65	1,11,307.70
Apr-23	16436	382	6.65	1,09,299.40
May-23	19667	591	6.65	1,30,785.55
Jun-23	23600	-	6.65	1,56,940.00
SUM	**242276**	**6,393.00**		**16,11,135.40**

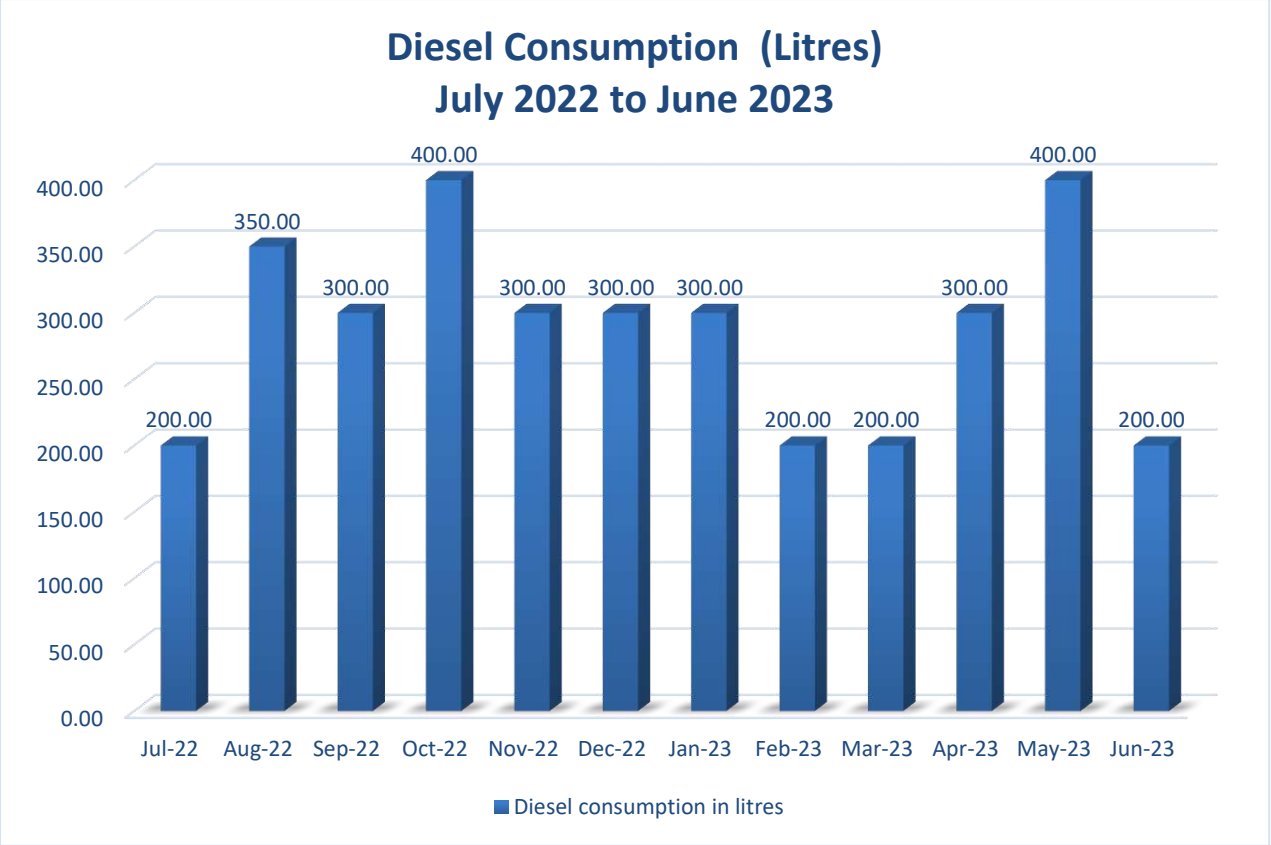




2. DIESEL CONSUMPTION

Below is the diesel consumption details in litres from July 2022 to June 2023.

Period	Diesel consumption (in litres)
Jul-22	200.00
Aug-22	350.00
Sep-22	300.00
Oct-22	400.00
Nov-22	300.00
Dec-22	300.00
Jan-23	300.00
Feb-23	200.00
Mar-23	200.00
Apr-23	300.00
May-23	400.00
Jun-23	200.00
Total	**3450.00**



3. ANALYSIS OF DG SETS

In the campus, there is only one Diesel Generator (DG) set for its electrical power needs in case of Grid power failure. DG sets capacity is 250 kVA.

DG Set Design Details		
Description	***Unit***	***DG at Station 1***
Rated capacity	kVA	120
Hz		50
Sl No.		RG 1-125WS-103
Make		
Volts	Volts	415
PF		0.8
Phase		3
RPM		1500
Amps	Amps	1000 Wt Amp.
Mfg.		29.03.07

DG Set Operation details		
Operating hours during testing	Hours	0.50
% Loading	%	61.74
Energy Generation	kWh	32.25
Load	kVA	85
Fuel consumption during testing	Litre	5
Specific energy generation	kWh/litre	3.02

Observation and Suggestions:-

Soundproof silent generators are an efficient tool to keep both noise and vibration at low levels. For the power backup of the institution, the soundproof model is installed near herbal garden of the institution.

As per the trial taken during the energy audit the percentage loading of DG set is 61.74% which is ok and specific energy consumption of DG Sets 3.02 kWh/Litre which is satisfactory because as per manufacturer recommendation, best practices for SEC in DG sets range from 3.0 to 3.5 kWh/Litre and above.

We recommend college to initiate periodic maintenance schedule and stack monitoring of DG set through authorized lab.

Diesel Generator

4. AC SYSTEM

Energy Efficiency Ratio (EER): Performance of smaller chillers and rooftop units is frequently measured in EER rather than kW/ton. EER is calculated by dividing a chiller's cooling capacity (in Btu/h) by its power input (in watts) at full-load conditions. The higher the EER, the more efficient the unit. The cooling effect produced is quantified as tons of refrigeration (TR). The above TR is also called as air-conditioning tonnage.

There are total 32 ACs installed in Guru Nanak Girls College in various areas of various capacities and types, details of the same are given below:-

Sl No.	Location/Identification	Type(Window/Split)	Quantity	TR Rating	Room Temp. (°C)	AC-Tout (°C)	AC-Tin (°C)	Room-RH (%)	Area (m2)	Air velocity (m/s)	Enthalpy Hout	Enthalpy Hin	Heat Load in TR	KW supplied	(Eff.) Power per Ton (KW /TON)	EER
1	Director office	S	1	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.53	2.3
2	Principal office	W	2	1.5	23	12	20	52	0.03	2	25	38	0.3	0.6	1.67	2.1
3	Gurudwara Sahib	S	2	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.53	2.3
4	Auditorium	W	4	1.5	23	12	20	52	0.03	2	25	38	0.3	0.6	1.67	2.1
5	Library	S	8	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.53	2.3
6	Bio-Tech Lab	W	1	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.53	2.3
7	Seminar Hall	S	2	1.5	23	12	20	52	0.03	2	25	38	0.3	0.6	1.67	2.1
8	Seminar Hall	W	1	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.53	2.3
9	Studio	W	1	1.5	23	12	20	52	0.03	2	25	38	0.3	0.6	1.67	2.1
10	Editing Lab	W	1	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.53	2.3
11	Administrative Block	S	3	1.5	23	12	20	52	0.03	2	25	38	0.3	0.6	1.67	2.1
12	Administrative Block	W	1	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.53	2.3
13	Comp. Lab	S	5	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.53	2.3

Remarks: - We have checked the Energy Efficiency Ratio of ACs and EER of AC's is fairly OK. But in the future, you should purchase 5-star rated invertor-based split AC's because the power consumption of inverter-based BEE 5-star rated AC's is less than non-star rated AC's.

Also, we recommend Guru Nanak Girls College to organize periodic maintenance schedules and take corrective actions for insulating of AC's refrigerant lines in order to protect against energy losses.

Star rated AC

5. FANS ANALYSIS

In the Guru Nanak Girls College, there are 342 fans installed, all ceiling fans are of 60W. The observations and suggestions are given below.

Sl No.	Location/ Identification	Ceiling Fan-60W
1	Administration	8
2	Principal	5
3	ICT Lab	7
4	Eco Dept.	4
5	Fine Art	4
6	Geography	4
7	Mess	11
8	Comp. Lab	27
9	Hindi Dept.	3
10	Chemistry	17
11	Music	12
12	Social Work	1
13	Studio	0
14	Home Sci.	14
15	Library	46
16	IQAC	2
17	Seminar Hall	10
18	Music	3
19	Marketing	1
20	Zoology	8
21	Botany	8
22	BioTech	6
23	Canteen	8
24	Education	13
25	NCC	1
26	Panjabi	1
27	Porch	9
28	Basement	22
29	Physics	14
30	Room No -1	4
31	Room No -2	4
32	Room No -3	4
33	Room No -5	4
34	Room No -6	4
35	Room No -7	4

36	Room No -9	2
37	Room No -10	2
38	Room No -11	2
39	Room No -12	2
40	Room No -15	4
41	Room No -16	4
42	Room No -17	4
43	Room No -21	4
44	Room No -22	4
45	Room No -23	4
46	Room No -24	2
47	Room No -25	2
48	Room No -26	4
49	New Room -40	2
50	Room No -41	2
51	Room No -42	2
52	Room No -43	2
53	Cabin	1
	TOTAL	342

Observation and Suggestions:-

In the college, all the ceiling fans are of 60 W but BEE 5 Star Rated of 30W Ceiling Fans are present in the market. We recommend to consider BEE 5 Star rated 30W fans for all future purchases.

Note:- Energy saving will increase or decrease if operating hours of machine /equipment will be increased or decreased and payback period will also increase or decrease if cost of investment (Cost of machine/equipment/accessories of machine) will increase or decrease because cost of investment is taken on tentative basis.

6. ANALYSIS OF LIGHTING SYSTEM

6.1 Brief description of existing system

For assessing energy efficiency of lighting system, Inventory of the Lighting System has been noted / collected, with the aid of a lux meter, measurement and documentation of the lux levels at various locations at working level has been done.

6.2 Inventory of Lighting

Sl. No.	Location/ Identification	200W-LED High Mast	36W Tube light

1	Mess	12	12
2	Comp. Lab	18	18
3	Hindi Dept.	3	3
4	Chemistry	4	14
5	Music	10	10
6	Social Work	1	1
7	Studio	2	2
8	Home Sci.	6	6
9	Library	39	39
10	Ground Floor	76	76
11	1st	20	20
12	2nd	55	55
13	3rd	40	40
	TOTAL	**286**	**296**

6.3 Lux Measurement

Description	Lux	Remark
Class Rooms	120 to 235	Acceptable
Offices	130 to 240	Acceptable
Corridors	35 to 90	Acceptable
Washrooms	45 to 76	Acceptable
Outdoor	36 to 95	Acceptable
Computer Lab	150 to 289	Acceptable
Parking area	45 to 94	Acceptable
Canteen	69 to 185	Acceptable

Observation

College has initiated LED based lighting solution, but still there are 296 (36W) tube lights. LEDs save energy, the life span is much greater and emit virtually no heat. We recommend to replace the tube lights with LEDs.

Additionally, we recommend to install motion sensor-based lights in common areas such as library, washrooms, corridors, etc.

We also recommend to use solar lights for open areas like parking, ground, street lights, etc. Table below shows the performance characteristics comparison of all luminaries.

Table - Luminous Performance Characteristics of Commonly Used Luminaries					
Type of Lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life
	Range	Avg.			
Incandescent	8-18	14	Excellent (100)	Homes, restaurants, general lighting emergency lighting	1000
Fluorescent lamps	46-60	50	Good w.r.t coating (67-77)	Offices, shops, hospitals, homes	5000
Compact fluorescent Lamps (CFL)	40-70	60	Very Good (85)	Hotels, shops, homes, offices	8000-10000
High-pressure mercury (HPMV)	44-57	50	Fair (45)	General lighting in factories, garages, and car parking. floodlighting	5000
Halogen lamps	18-24	22	Excellent (100)	Display, flood lightening, stadium exhibition grounds, construction areas	2000 - 4000
High-pressure sodium (HPSV) SON	67-121	90	Fair (22)	General lighting in warehouses, factories, street lighting	6000 - 12000
Low-pressure sodium (LPSV) SOX	101-175	150	Poor (10)	Roadways, tunnels, canals, street lighting	6000 - 12000
Metal halide lamps	75-125	100	Good (70)	Industrial bays, spot lighting, floodlighting, retail stores	8000
LED Lamps	30-50	40	Good (70)	Reading lights, desk lamps, night lights, spotlights, security lights, signage lights, etc.	40000 - 100000

7. OTHER POWER CONSUMPTION

7.1 Inventory of IT Infrastructure

Sl No.	Location/Identification	Desktop	Laptop	Printers (All in 1)
1	Lab - 1, & (Ground Floor)	41		1
2	Lab - 2,3 (First Floor)	22		1
3	Lab - 4	12		1
4	Lab - 5, 6	37		1
5	Editing Lab	5		1
6	Studio	2		1
7	Math Lab	11		1
8	Campus - II Lab	40		1
9	Departments & Library	25		1
10	Admin Office	12		2
11	Physics Lab	5		1
12	Smart Class Room	4		
13	BIT Room	1		1
14	Other places	9		
15	Laptops for Admin Team		5	
	TOTAL	**226**	**5**	**13**

7.2 Water pump details

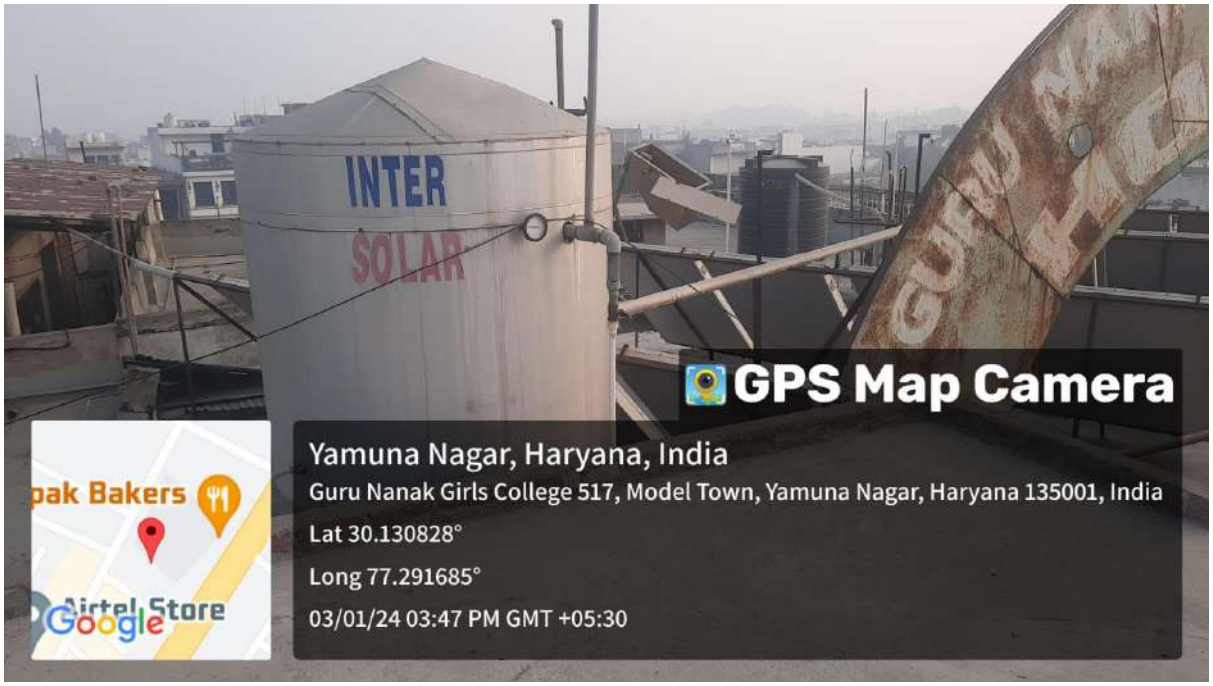
Sr. No.	Description	Unit	Pump No.-1	Pump No.-2
1	Rated Power of Motor	KW	0.746	1.5
2	Motor Eff.	%	80%	80%
3	Discharge Head	m	30	30
4	Suction Head	m	50	50
5	Pump Type	Submersible/ Monoblock/ Centrifugal Etc.	Monoblock	Monoblock

7.3 Water cooler & Exhaust fan details

Sl No.	Location/Identification	60W Exhaust Fan	Water Cooler-200W
1	Physics Lab	1	
2	H.Sc Lac-1	2	
3	H.Sc Lac-2	2	
4	Canteen	4	
5	Computer Lab	1	
6	Chemistry Lab	5	
7	Maths	1	
8	Ground Floor		3
9	First Floor		1
10	Second Floor		1
11	Third Floor		1
12	**TOTAL**	**16**	**6**

ANALYSIS

There should be a regular maintenance schedule of equipment like pumps, exhaust fans and IT equipment. Electronics such as computers, printers, scanners, etc. more than 3 year or 5 years (as per their life) should be replaced with new computers/laptops. Ideal Temperature should be maintained for all electronic appliances.



***** **END OF THE REPORT** ******