ENVIRONMENT AUDIT REPORT

CONSULTATION REPORT



NRI Institute of Information Science & Technology Bhopal (MP)

PREPARED BY

EMPIRICAL EXERGY PRIVATE LIMITED

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(2022-23)

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ACKNOWLEDGEMENT

Empirical Exergy Private Limited (EEPL), Indore takes this opportunity to appreciate & thank the management of **NRI Institute of Information Science & Technology, Bhopal (MP)** for giving us an opportunity to conduct environment audit for the college.

We are indeed touched by the helpful attitude and co-operation of all faculties and technical staff, who rendered their valuable assistance and co-operation the course of study.



Rajesh Kumar Singadiya
(Director)

M.Tech (Energy Management), PhD (Research Scholar) Accredited Energy Auditor
[AEA-0284] Certified Energy Auditor
[CEA-7271] (BEE, Ministry of Power, Govt. of India)
Empanelled Energy Auditor with MPUVN, Bhopal
M.P. Lead Auditor ISO50001:2011 (EnMS) from FICCI, Delhi Certified Water Auditor (NPC, Govt of India)
Charted Engineer [M-1699118], The Institution of Engineers (India)
Member of ISHRAE [58150]

CERTIFICATE

Empirical Exergy Private Limited
Registered Office: 18-E, Sudama Nagar, Indore -452009
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www.eeplgroups.com, email:-eempirical18@gmail.com
CIN No: U74999MP2018PTC045751

Ref No: EEPL/2022-23/C-098 **Date: - 05-11-2022**

ENVIRONMENTAL AUDIT CERTIFICATE

This is to certify that Empirical Exergy Private Limited (EEPL) Indore M.P. has conducted Environmental audit at **Nri institute of information, science and technology, Bhopal** (M.P.) for the academic Year 2022-23 and detailed audit report has been submitted.

We avail this opportunity to express our deep and sincere gratitude to the management for their wholehearted support and co-operations during the energy audit.

This certificate is being issued on the basis of audit conducted by EEPL.

For- **Empirical Exergy Private Limited**

Rajesh Kumar Singadiya (Director)

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Member of ISHRAE [58150]

EXECUTIVE SUMMARY

The executive summary of the Environment audit report furnished in this section briefly gives the identified water conservation measures that can be implemented in a phased manner to water conservation and increase the productivity of the college.

Green Initiative Already Taken by College

Rain Water Harvesting System:

- College has install rain water harvesting system on main college building. It is good initiative taken by management for water conservation. **It is greatly APPRECIABLE.**

AREAS FOR IMPROVEMENT AND RECOMMENDATION

FRESH WATER MONITORING SYSTEM:

- Installation of **"Cloud based (IoT based) ground water extraction monitoring system"** for well to quantify fresh water consumption per day in the college.
- Install water flow meters (Mechanical or Electronics) in distribution network, like college building, for quantity per day water consumption and waste water generation in the college campus.

WASTE WATER TREATMENT PLANT

- **STP Plant**: - Install STP plant for treatment of waste water generated in hostel from various activities and it can be reuse for grading. It will reduce fresh water consumption of the college campus.

OVERFLOW CONTROL SYSTEM

- Install overflow control system in overhead tanks.

ARREST WATER LEAKAGES:

- Arrest Water Leakages from any pipe immediately.

CHAPTER-01
INTRODUCTION

About College:-

NRI Group of Institutions (NGI) was founded by Mr D. Subodh Singh a technocrat and the NRI, in the year 2000. It runs by the Taramathi Education Society formed by NRIs based in the USA and highly qualified technocrats in India. NRI Group of institutions is a leading group of educational institutions of India that is providing professional degrees in engineering, pharmacy, management, law, nursing, physiotherapy and paramedical sciences for 21 years. The institute caters to over 5000+ students studying across 25 acres of high-tech campus. The institute nurture students coming from all walks of society to experience quality and equal education. The college is sensitive to individual, racial, ethnic differences and seeks students from diverse cultural backgrounds. Our institute believes in providing the best of the Indian Education system with a blend of educational techniques of the USA. Apart from providing education, we at NRI believe to develop responsible and sensitive citizens who should always be ready to serve society and the country.



Vision

- To attain global leadership in academics by exploring new frontiers of technology through innovative research and grooming future leaders as well as entrepreneurs.

Mission

- The institute mission is to build tomorrow of Indian Society by nurturing the career and lives of our students.
- The institute is dedicated to provide quality education and focus on the overall development of the student.
- The institute agenda is to prepare our students to make a difference in our society and the world by being the best in whatever field they choose.

Name of Departments:

The college offers various courses in Engineering, Science, and Management with following departments.

- Computer Science Engineering –B.Tech. & M.Tech.
- Civil Engineering- B.Tech.
- Electronics & Communication Engineering- B.Tech. & M.Tech.
- Electrical & Electronics Engineering – B.Tech. & M.Tech.
- Information Technology -B.Tech. & M.Tech.
- Mechanical Engineering – B.Tech. & M.Tech.
- Master of Business Administration- MBA
- Master of Computer Application- MCA
- Basic Science & Humanities

Integrated (Energy Environment & Green) Policy



NRI INSTITUTE OF INFORMATION SCIENCE & TECHNOLOGY

ISO 9001 - 2000 certified

(Run by Taramathi Education Society)
(Approved by AICTE, New Delhi, Govt. Of M.P., Affiliated to RGPV, Bhopal
1, Sajjan Singh Nagar, Opp. Patel Nagar, Raisen Road, Bhopal (M.P.)
Tel. No. 0755 - 4085500, 2529800 Fax: (0755) 2529059

Ref:

Date.....

Integrated Energy, Environment & Green Policy

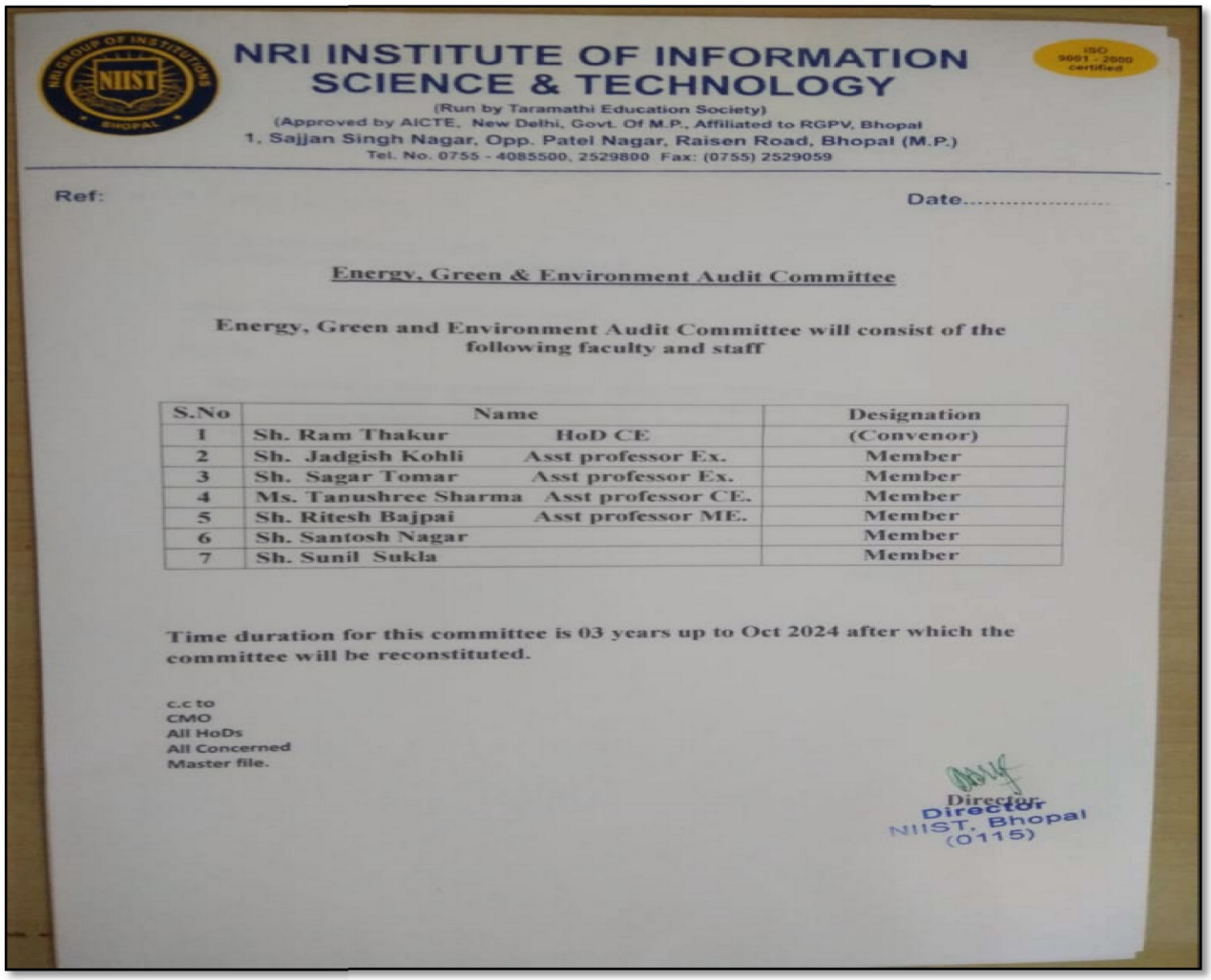
Management of our institution is committed to go green for making our nation to Atma-Nirbhar (i.e. Self-Sustainable) in the area of energy and environment.

Our Emphasis is to:

1. Ensure continual enhancements in our energy and water conservation methods and usage.
2. Procure and use energy efficient equipments and products.
3. Continuously monitoring the energy consumption patterns through periodic reviews & using latest informative systems (IOT).
4. Create awareness regarding necessity of energy conservation and making environment pollution free to all staff and students on a regular basis by arranging trainings, workshops, seminars, quiz competitions, etc.
5. Carry out regular energy, environment and green audits by certified auditors to identify key areas of improvements.

Director
NIIST, Bhopal
(0115)

Green Audit Committee



NRI INSTITUTE OF INFORMATION SCIENCE & TECHNOLOGY

(Run by Taramathi Education Society)
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1, Sajjan Singh Nagar, Opp. Patel Nagar, Raisen Road, Bhopal (M.P.)
Tel. No. 0755 - 4085500, 2529800 Fax: (0755) 2529059

Ref: Date.....

Energy, Green & Environment Audit Committee

Energy, Green and Environment Audit Committee will consist of the following faculty and staff

S.No	Name		Designation
1	Sh. Ram Thakur	HoD CE	(Convenor)
2	Sh. Jadgish Kohli	Asst professor Ex.	Member
3	Sh. Sagar Tomar	Asst professor Ex.	Member
4	Ms. Tanushree Sharma	Asst professor CE.	Member
5	Sh. Ritesh Bajpai	Asst professor ME.	Member
6	Sh. Santosh Nagar		Member
7	Sh. Sunil Sukla		Member

Time duration for this committee is 03 years up to Oct 2024 after which the committee will be reconstituted.

c.c to
CMO
All HoDs
All Concerned
Master file.

Director
NIIST, Bhopal
(0115)

Audit Team

The study team constituted of the following senior technical executives from **Empirical Exergy Private Limited,**

- **Mr. Rakesh Pathak**, [Director]
- **Dr. Suresh Soni [**Reviewer**]**
- **Mr. Sachin Kumawat** [Project Engineer]
- **Mr. Lokesh Kumar Varma** [Project Engineer]
- **Mr. Ajay Nahra,** [Site Engineer]

About Environment Auditing

Water audits can be a highly valuable tool for institute in a wide range of ways to improve their energy, environment and economic performance. while reducing wastages and operating costs. Water audits provide a basis for calculating the economic benefits of water conservation projects by establishing the current rates of water use and their associated cost.

Objectives of Environment audit

The general objective of audit is to prepare a baseline report on water conservation measures to mitigate consumption, improve quality and sustainable practices.

The specific objectives are:

- To monitor the water consumption and water conservation practices.
- To assess the quantity of water, usage, quantity of waste water generation and their reduction within the college.

Target Areas of Environment audit

This indicator addresses water sources, water consumption, irrigation, storm water, appliances and fixtures aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible institution should examine its water use practices.

Methodology followed for conducting Environment audit

Step 1: Walk through survey

- Understanding of existing water sourcing, storage and distribution facility.
- Assessing the water demand and water consumption areas/processes.
- Preparation of detailed water circuit diagram.

Step 2: Secondary Data Collection

- Analyse historic water use and wastewater generation
- Field measurements for estimating current water use
- Metered & unmetered supplies.
- Understanding of "base" flow and usage trend at site
- Past water bills
- Wastewater treatment scheme & costs etc.

Step 3: Site Environment Audit Planning (based on site operations and practices)

- Preparation of water flow diagram to quantify water use at various locations
- Wastewater flow measurement and sampling plan

Step 4: Conduction of Detailed Environment Audit & Measurements

- Conduction of field measurements to quantify water/wastewater streams
- Power measurement of pumps/motors
- Preparation of water balance diagram
- Establishing water consumption pattern
- Detection of potential leaks & water losses in the system
- Assessment of productive and unproductive usage of water
- Determine key opportunities for water consumption reduction, reuse & recycle.

Step 5: Preparation of Environment Audit Report

- Documentation of collected & analysed water balancing and measurement details
- Projects and procedures to maximize water savings and minimize water losses.
- Opportunities for water conservation based on reduce/ recycle/ reuse and recharge options

CHAPTER- 2
WATER CONSUMPTION AND WASTE WATER SOURCES

Details of Source of Fresh Water:

The main source of water for college is bore well. The major water requirement of college is drinking water and non-potable uses. There are total 2 no bore well.

Sr. No	Source of Water (Bore well/ Open well/ Municipality)	Depth (ft/m)	Type of Pumps	Rated (HP)	Rated Flow (m^3/hr)	Running Hr per day
1	Bore well	200	Submersible	7.5	6.5	4
2	Bore well	200	Submersible	7.5	6.5	4



Borwall No.-1



Borwall No.-2

Observation:

Bore well No-1 & 2 used for water supply in college building. Water Audit team was measured the flow rate of each bore-well and estimated water consumption per day on the basis of ground water extracted from above water sources.

Water flow Measurement on Bore-well

Audit team was measures water flow with the help of ultrasonic flow meter at main line of Bore wells. Estimated fresh water consumption is 10.2 m3 per day. It was observed that there is no water flow meter available for water measurement.

Table 2.1:- Water Flow Measurements at different Bore well.

Sr. No	Parameter	Unit	Result
Borwall-01	Flow	m3/hr	5.2
Borwall-02	Flow	m3/hr	5.0
			Total = 10.2 m3/hr

List of Storage Tank:

There is sufficient water storage capacity in the college campus. Details of water tanks are given below:

Type of Storage System (Over Head Tank, Underground Tanks, Reservoir etc.)	Location	Storage Capacity (m^3)	Dimensions (Meter)	Remark
Underground	Beside NIIST store	53	6x3.7x2.4	RCC tank
Overhead tank	NIIST roof	10	Dia. =5.8, h=2	PVC
Overhead tank	NIIST roof	10	Dia. =5.8, h=2	PVC
Overhead tank	NIIST roof	10	Dia. =5.8, h=2	PVC
Overhead tank	NIIST roof	10	Dia. =5.8, h=2	PVC
Overhead tank	NIIST roof	5	Dia. =4.2,h=1.5	PVC
Overhead tank	NIIST roof	5	Dia. =4.2,h=1.5	PVC
Overhead tank	NIIST roof	5	Dia. =4.2,h=1.5	RCC
Underground tank	Power station	2	2x1x1	RCC

Fresh Water And Major Uses:

It is observe that fresh water is major uses for drinking water, service water, gardening & new construction work.

Table: Details of No of Tap

Sr. No	Name of Building/Department/Section	No. of taps Drinking Water	No. of taps Service Water
1	NIIST	15	39
2	Workshop	02	05

Some application with photograph:









Recommended Water System for Gardening

There is good potential for water saving by adopt "Automatic Watering 360 adjustable misting nozzle irrigation Dripper's system" for plants. adjustable drip irrigation tools to provide different amounts of water depending on the water requirements of different plants. The drip speed can be set as for indoor and outdoor plants.



Adjustable Misting Nozzle Irrigation Drippers



Automatic Water Timer Unit

Technology for Drip Water Irrigation for plant

Waste water Generation sources:





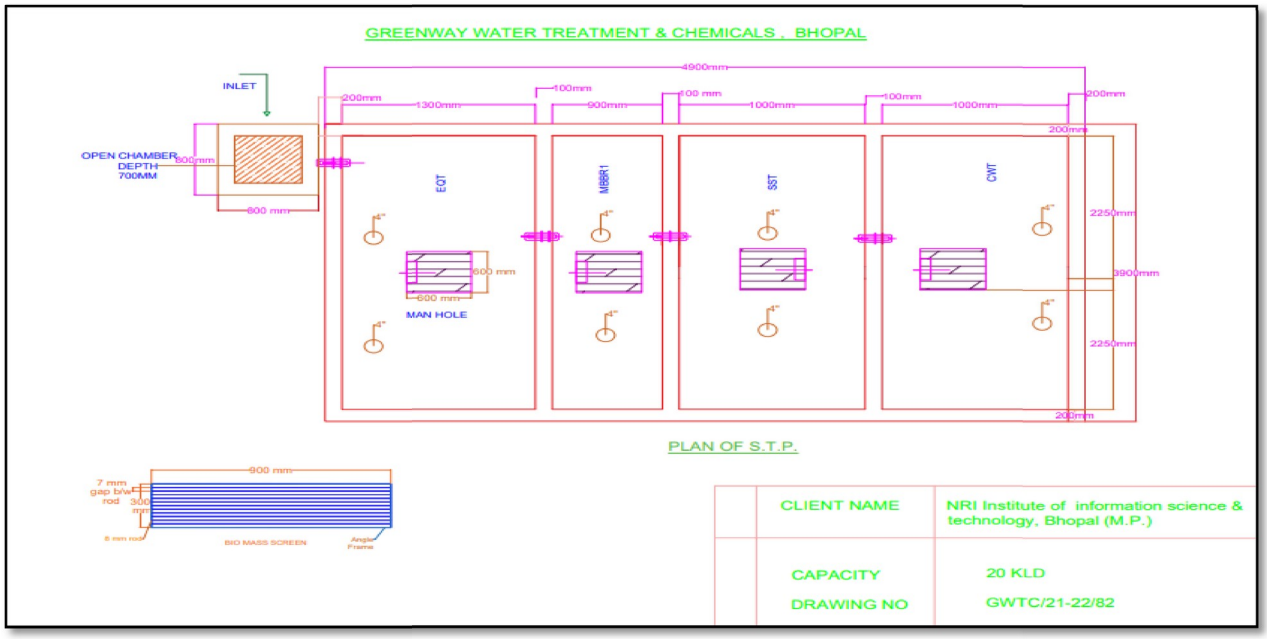


Details of Hand Wash and Urinals/Toilets

Sr. No	Name of Building/Department/Section	Hand Wash	Urinals	Toilets
1	NIIST	39	59	25
2	Workshop	05	05	04

STP plant:

It was observed that college has 20 KLD STP plant under construction. Detailed plant layout is given below.





2.7. Details of Water Conservation/Measures Undertaken By Collage in past

S. No.	Water Conservation/Saving Measure Undertaken	Annual Water Saving (cubic meter)	Annual Monetary Saving (Rs)	Investments (Rs)	Pay Back Period (Year/s)
1	RCC tank constructed	20	1,00,000	75000 Rs.	One year
2	PVC tank	5	25000	35000 Rs.	One year
3	PVC tank	5	25000	35000 Rs.	One year

2.8 Rainwater harvesting (RWH):

It was observed that college management has install 59 MLD rain water harvesting system for college building. **It's appreciable:**



Fig.-: Rainwater harvesting system