



**Environment Audit Report**  
**Kurukshetra University Kurukshetra**  
**(A+ Grade NAAC Accredited)**  
**Haryana Year 2020-21**



## **ENVIRONMENT AUDIT REPORT**

### **CONSULTATION REPORT**



**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**(Established by the State legislature act XII of 1956)**

**(A+ Grade NAAC Accredited)**

**Thanesar, Haryana 136119**

PREPARED BY

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**(2020-21)**

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## **ACKNOWLEDGEMENT**

**Empirical Exergy Private Limited (EEPL), Indore (M.P)** takes this opportunity to appreciate & thank the management of **Kurukshetra University Kurukshetra Haryana** for giving us an opportunity to conduct environment audit for the University.


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]  
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Empanelled Energy Auditor with MPUVN, Bhopal M.P.  
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Certified Water Auditor (NPC, Govt of India)  
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## BUREAU OF ENERGY EFFICIENCY



Examination Registration No.: ..... **EA- 7271** .....

Accreditation Registration No.: ..... **AEA-284** .....

### Certificate of Accreditation

This is to certify that Mr./Ms. **Shri. Rajesh Kumar Singadiya** having its trade/registered office at ..... has been given accreditation as accredited energy auditor. The certificate shall be effective from **9<sup>th</sup>** day of **May, 2018** .....


The certificate is subject to the provisions of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

This certificate shall be valid until it is cancelled under regulation 9 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

On cancellation, the certificate of accreditation shall be surrendered to the Bureau within fifteen days from the date of receipt of order of cancellation.

Your name has been entered at AEA No. **284** ..... in the register of list of accredited energy auditors. Your name shall be liable to be struck out on the grounds specified in regulation 8 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

Given under the seal of the Bureau of Energy Efficiency, Ministry of Power, this **5<sup>th</sup>** day of **October, 2018**

  
 Secretary,  
 Bureau of Energy Efficiency  
 New Delhi



## 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 conserve the water and increase the productivity of the University.

### Initiative for Environment Management Taken by University

#### **RAINWATER HARVESTING SYSTEM:**

- ❖ University has 14 nos of “Rainwater harvesting system” in University campus for maintaining ground water level. This system saves about 80 to 90 % of roof top rain water of the building. **It is Appreciable.**
- ❖ Audit team discussed with KUK Management. They informed that University has proposed 34 nos New Rain water harvesting pit. It is under process. **It is Appreciable.**

#### **SPRINKLE IRRIGATION SYSTEM FOR LAWN**

- ❖ University uses sprinkle irrigation system for Lawn area. **It is Appreciable.**

#### **WASTE WATER MANAGEMENT:**

- ❖ University has 2.4 MLD STP plant for waste water treatment. The waste water generated from various departments, Hostels, and from residential area. **It is Appreciable**

#### **E-WASTE MANAGEMENT: -**

- ❖ University has E-waste management system for the final safe disposal of the E-waste. The list of e-waste items written off by the write off committee and approved by concerned authority is provided to co-ordinator, E-Waste (Head Computer Centre) for further disposal to E-waste vendor according to E-Waste policy.

## **AREAS FOR IMPROVEMENT**

#### **WATER MONITORING SYSTEM:**

- ❖ Installation of “Cloud based (IoT based) Ground Water extraction monitoring system” for bore-well to quantify fresh water consumption per day in the University”.

#### **WASTE WATER MEASUREMENT**

- ❖ Installation of “Water flow meter” on STP Plant to measure treated waste water per day. It will also be helpful for determination of chemical & operational cost of the plants.



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**REPLACEMENT OF ALL OLD BOREWELL STARTERS: -**

- ❖ It is recommended to update old electrical starter panels by new updated System.

**DRIP WATER IRRIGATION SYSTEM FOR PLANTS.**

- ❖ Use drip water irrigation system for Plants.

**USE SENSOR BASED EFFICIENT WATER TAPS: -**

- ❖ Water saving taps either reduce water flow or automatically switch off to help save water. So, it is highly recommended to install efficient water taps in the University campus to reduce water wastage.

**USE SENSOR BASED EFFICIENT URINAL TAPS: -**

- ❖ Replacing these inefficient fixtures with water sensor labelled flushing urinal can save between 0.5 to 04 liters per flush without sacrificing performance. Installing water saving flushing urinal will not only reduce water use in facilities but also save money on water bills.

**INSTALL ETP PLANT: -**

- ❖ University has 9 no's of departments that use chemicals in lab activity and generate waste water also. It is highly recommended for all the 9 departments to install separate drain line and install ETP plant for treatment of contaminated water.

**SOLID WASTE MANAGEMENT:**

- ❖ The basic principle of good waste management practice is based on the concept of 3R's namely, reduce, recycle, and reuse.

**ADOPT 03 DUST BIN SYSTEM: -**

- ❖ It is highly recommended to adopt 03 dust bin system in University. At present University has single dust bin system.

**INSTALL ORGANIC CONVERTER: -**

- ❖ There is good potential to install organic converter in hostels for kitchen and vegetable organic waste.

**VERMICOMPOST UNIT:**

- ❖ Install vermicompost unit for Biodegradable waste generated from garden and lawn area.



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## **OTHER SUGGESTIONS.**

Some very important suggestions are: -

- ✚ Prepare the water management policy and work towards creating and implementing a strategy to reduce the water consumption.
- ✚ Conduct awareness programs for water conservation and sustainable development.
- ✚ Establish institutional environment policy and set an example for environmental responsibility and practices of resource conservation, recycling and waste management.
- ✚ Involve all stakeholders and encourage involvement of government, founders and industry in supporting interdisciplinary research, education, policy formation, and information exchange in water conservation and sustainable development.
- ✚ Collaborate for interdisciplinary approaches to develop curricula, research initiatives, operations, and outreach activities that support an environmentally sustainable future.
- ✚ Promote 3R education policy (reduces, reuse, and recycle) in campus.
- ✚ Arrange training programmes on water management system and nature conservation.
- ✚ Ensure participation of students and teachers in local water issues.
- ✚ Conduct seminars, workshops and exhibitions on water and environmental education.



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**CHAPTER-1**  
**INTRODUCTION**

**1.1 About University**

Kurukshetra University is one of the premier educational institutions of India. Established in 1956, the University is providing higher education to over half a million students on the campus and its affiliated colleges. By virtue of its commitment to excellence, the University has been awarded A+ Grade by NAAC and has been placed at 8<sup>th</sup> position amongst the State Universities of the country in Category-I by the Ministry of Human Resource Development (MHRD) and has also been granted academic autonomy. Located on the southern bank of famed Brahm Sarovar, Kurukshetra University has a sprawling campus spread over 473 acres. In addition to providing quality education to the students, Kurukshetra University embodies the values of Yogastha Kuru Karmani, enshrined in Bhagwadgita, which means performing one's activities while remaining steadfast in Yoga.

The University is in the rapid process of transformation to an institution of excellence. In this process, digitalization of the University is being done to develop an efficient and transparent system that would further facilitate a learner's experience in the University.

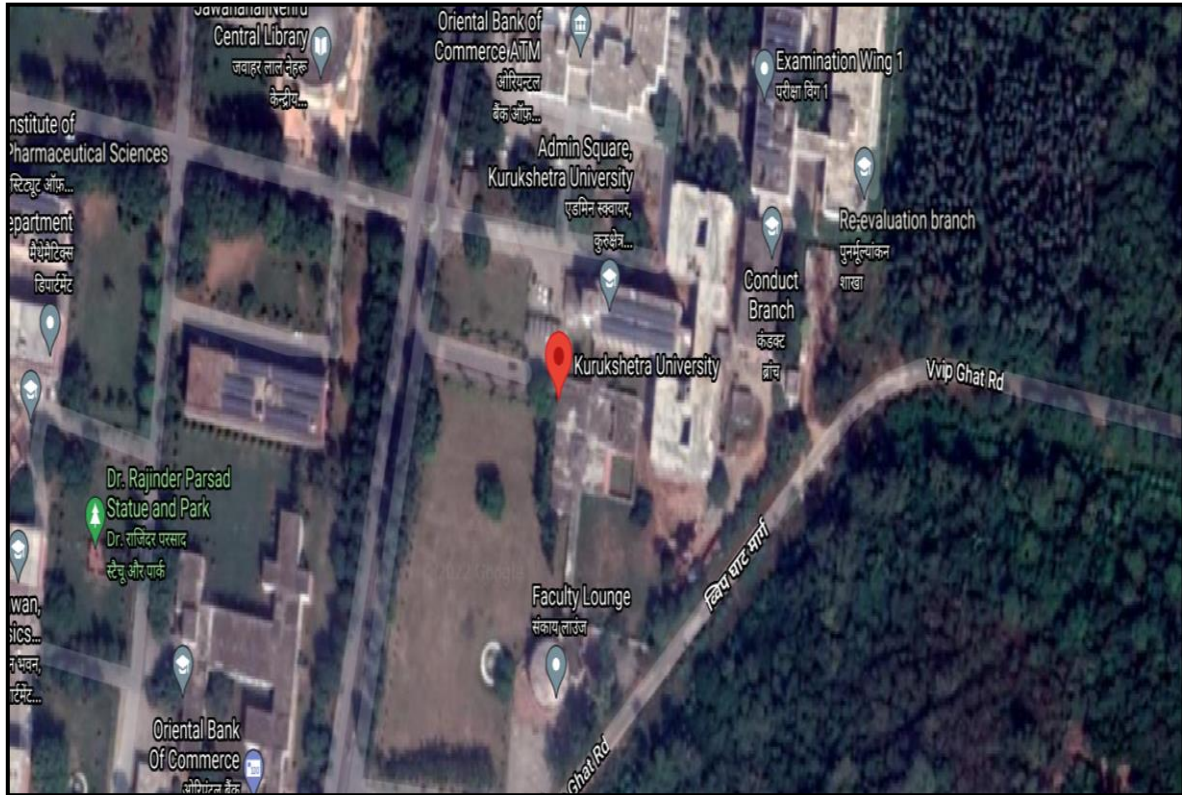
The University programmes combine the enduring value of a liberal arts education with the skills and experience offered by professional departments. The University offers 175 courses on the campus in 47 Departments/institutes through a highly qualified faculty. The University also plays an important role in providing higher education to the youth of the State through its 282 affiliated colleges and institutes in seven districts of Haryana.

The campus of the University has often been rated as one of the most beautiful campuses in India. It resembles a large, self-contained educational village with lecture theatres, smart class rooms, Wi-Fi campus, 24 hrs library facility, laboratories, on campus hostel accommodation, cafeterias, canteens, market, swimming pool, gymnasium, bank, ATM's, post office and world-class sports facilities. The most remarkable feature of the campus is a seamless interconnection of nature and the built environment. There are a number of lush green gardens, water fountains and sidewalks which provide an ideal environment on the campus for study and leisure.





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**Figure:- Image of KUK from Google map**

**University Faculties:-**

- ✚ Faculty of Arts & Languages
- ✚ Faculty of Social Sciences
- ✚ Faculty of Life Sciences
- ✚ Faculty of Science
- ✚ Faculty of Education
- ✚ Faculty of Indic Studies
- ✚ Faculty of Engg. & Technology
- ✚ Faculty of Law
- ✚ Faculty of Commerce & Management



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## 1.2 About University Campus:

Kurukshetra University, Kurukshetra (KUK) is a University established on 11 January 1956 in Kurukshetra, in the Indian state of Haryana, 160 kilometres (99 mi) from the capital, Delhi. It is a member of Association of Commonwealth Universities.

Kurukshetra University spread over 473 acres (1.91 km<sup>2</sup>), the KUK campus is located on the western bank of Brahma Sarovar in the Hindu holy city of Kurukshetra

## Colleges and schools in Kurukshetra University

The University has these colleges, schools and institutes

- ✚ University Senior Secondary Model School
- ✚ Institute of Integrated and Honours Studies (Formerly University College)
- ✚ University College of Education
- ✚ Institute of Environmental studies
- ✚ Department of Law
- ✚ Department of Geophysics
- ✚ University School of Management
- ✚ University Institute of Engineering and Technology
- ✚ Institute of Management Studies
- ✚ Institute of Mass Communication & Media Technology



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Table 1.1: -Details of Building and department in KUK University: -

Sr. No	Administration
1	Office of Vice Chancellor
2	Office of the Registrar
Important Functionaries	
1	Deans
2	Other Offices
3	Chairpersons/Directors
4	Teaching Department
5	Deputy Registrar/Assistant Registrar/Admin. Officers
6	Office of the Dean Academic Affairs
7	Office of Dean Faculty of Science
8	Office of Dean Student Welfare
Accounts Departments	
1	Main Accounts
2	Bill Section
3	Cash and Fee
4	Income
5	Pension Cell
6	Fee Section
7	PF Section
8	Planning Section
9	Cheque Section
10	Audit Internal
11	State Govt (Audit)
12	Establishment Branch (Teaching)
13	Establishment Branch (Non-Teaching)
14	Academic Branch
15	Syllabus Branch
16	Scholarship Branch
17	Registration Branch
18	PH.D Branch
19	General Branch
20	Colleges Branch
Examination-1	
1	Confidential Cell
2	Conduct Branch (Theory)
3	Conduct Branch (Practical)
4	UMC
5	PH.D
6	Re-Evaluation Branch
7	Secrecy Branch
Examination-2	



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1	Examination Branch -2
2	Result Branch-1
3	Result Branch-2
4	Computer Lab
5	Result Branch -3
6	Certification Section
7	Construction Branch
<b>University Teaching Department/Institute</b>	
1	AIH-Culture & Archaeology
2	Bio-Chemistry
3	Bio-Technology
4	Botany
5	Chemistry
6	Commerce
7	Computer Science & Application
8	Economics
9	Education
10	Electronic Science
11	English
12	Fine Arts
13	Foreign languages
14	Geography
15	Geology
16	Geo-Physics
17	Hindi
18	History
19	Home Science
20	Instrumentation
21	Inst.of Environmental Studies
22	Inst. Of Pharmaceutical Sciences
23	Inst.of Law
24	Inst. of Mass communication & Media Technology
25	Inst. of Management Studies
26	Law
27	Library and Information Science
28	Mathematics
29	Micro-Biology
30	Music and Dance
31	Punjabi
32	Philosophy
33	Physical Education
34	Psychology
35	Public Administration
36	Physics
37	Political Science



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38	Sanskrit, Pali & Prakriti
39	Sanskrit and Indological Studies
40	Social Work
41	Sociology
42	Statistics and O R
43	Tourism and Hotel Management
44	University Institute of Eng. & Technology
45	University School of Management
46	Women's Study Research Centre
47	UIET Building
48	Public Administration department
49	ION Beam Centre
50	Zoology
<b>Institute/College/School at the Campus</b>	
1	University College (Institute of Integrated Honors Studies)
2	University College of Education (Institute of Teacher Training & Research)
3	University Sr. Sec. Model School
<b>Directorates Centres</b>	
1	Directorate of Distance Education
2	UGC Human Resource Development Centre
3	Computer Centre
4	Mahatma Gandhi Coaching Centre
5	Dr. B. R Ambedkar Studies Centre
6	Gulzari Lal Nanda Centre of Ethics & Philosophy
7	University Health Centre
<b>Hostels Office</b>	
1	Chief Warden (Boys)
2	Chief Warden (Girls)
<b>Hostel (Boys)</b>	
1	Ambedkar Bhawan
2	Arjun Bhawan
3	Ch. Devi Lal Bhawan
4	Harsh Bhawan
5	Narhari Bhawan
6	Pratap Bhawan
7	Ch. Ranbir Singh Bhawan
8	Shaheed Bhagat Singh Bhawan
9	Swami Vivekanand Bhawan
10	Subhash Bhawan
11	Bheema Bhawan
12	Tagore Bhawan
13	International Bhawan



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<b>Hostel (Girls)</b>	
1	Ahilaya Bhawan
2	Bharti Bhawan
3	Devyani Bhawan
4	Ganga Bhawan
5	Gargi Bhawan
6	Kasturba Bhawan
7	Kalpana Chawla Bhawan
8	Laxmi Bai Bhawan
9	Meera Bhawan
10	Sarswati Bhawan
11	Subhadra Bhawan
12	Uttara Bhawan
13	Yamuna Bhawan
<b>Services / Facilities</b>	
1	Jawahar Lal Nehru Library
2	Public Relations Office
3	Dharohar Haryana Museum
4	Youth & Cultural Affairs
5	University Printing & Publications Bureau
6	NSS
7	NCC
8	Directorate of Sports
9	Land & Farming Department
10	Horticulture Department
11	Security Department
12	Employment Bureau (University)
<b>Associations</b>	
1	Kurukshetra University Teaching 'Association (KUTA)
2	Kurukshetra University Nonteaching Employees Association (KUNTEA)
3	Kurukshetra University Kurukshetra Alumni Association (KUKAA)
<b>General</b>	
1	Post Office and Banks on Campus
2	NIT Kurukshetra
3	District Administration
3	University Health Centre and Doctors (On University Penal of Kurukshetra)
4	Press Correspondents/Journalists/Print Media
5	Electronic Media
6	Sport Education Building
7	Non-Teaching club
8	Senior Model School
9	Construction Branch
10	University Market



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**1.3 Green Monitoring Committee: -**

INTERNAL QUALITY ASSURANCE CELL  
KURUKSHETRA UNIVERSITY KURUKSHETRA  
[Established by the State Legislature Act XII of 1956]  
(\*A+\* Grade, NAAC Accredited)

E-mail:- [head.iqac@kuk.ac.in](mailto:head.iqac@kuk.ac.in) Dated: 06.04.2021

**NOTIFICATION**

The IQAC Committee in its meeting held under the Chairmanship of the Vice-Chancellor on March 15, 2021 has constituted a Committee of following members to frame the modalities for Green audit, Energy audit, and Environment audit of the University and also suggest the ways for environmental promotional activities beyond the campus, sensor based energy conservation.

- (i) Prof. Smita Chaudhary (Convener), Institute of Environmental Studies.
- (ii) Dr. Ram Avtar, Electrical Department, UIET
- (iii) Dr. Pooja Arora, Institute of Environmental Studies
- (iv) Dr. Dipti Grover, Institute of Environmental Studies
- (v) XEN/SDO (Electrical), Construction Branch

sd/-  
Director, IQAC

Endst. No. IQAC/21/ 932 (1-10) Dated: 06.04.2021

Copy to:-

- a) All the members of the Committee for necessary actions.
- b) Chairpersons/Directors of the concerned Departments/Institutes.
- c) P.A. to the Vice-Chancellor, KUK (for kind information of the Vice-Chancellor)
- d) PS to the Registrar, KUK (for kind information of the Registrar)

Director  
Internal Quality Assurance  
Kurukshetra University, Kuruk

**1. 4 Energy Audit Team**

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

- ✚ **Er.Rajesh Kumar Singadiya** [Director & Accredited Energy Auditor AEA-0284]
- ✚ **Mr. Rakesh Pathak,** [Director]
- ✚ **Dr. Suresh Soni** [Reviewer]
- ✚ **Mr. Sachin Kumawat** [Project Engineer]
- ✚ **Mrs. Laxmi Raikwar Singadiya,** [Energy Engineer]
- ✚ **Mr. Ajay Nahra,** [Site Engineer]
- ✚ **Mr. Akash Kumar,** [Site Engineer]
- ✚ **Mr. Purushottam Bhade,** [Site Engineer]



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### **1.5 About Environment Auditing**

Environment 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.

### **1.6 Objectives of Environment audit**

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

#### **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 University.
-  To assess the waste management practices
-  To assess the rain water harvesting systems in the campus

### **1.7 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 and waste management practices.





## **1.8 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.
- ✚ Identifying the sources of waste generation in the campus
- ✚ Identifying the units for rain water harvesting

### **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.
- ✚ Determine key opportunities for waste reduction and management
- ✚ Identify RWH systems in the campus

### **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 (RWH systems)
- ✚ Opportunities for waste reduction, recycling and management
- ✚ Opportunities for RWH systems and water



## CHAPTER- 2 WATER CONSUMPTION AND WASTE WATER SOURCES

### 2.1 Details of Source of Fresh Water and Use Areas:

The main source of freshwater is Borewell for the University. The freshwater is mainly used for drinking, housekeeping, gardening, domestic activity and new construction project. Details of the pumps are given below in table.

Table: 2.1 Details of Fresh water sources and Supply pumps

Sr. No	Source of Water	Location	Type of Pumps	Rated (HP)
1	Borewell-02	Rose Garden	Submersible	30 HP
2	Borewell-03	Near Ambedkar Bhavan Hostel	Submersible	30 HP
3	Borewell-04	University 3 <sup>rd</sup> . Gate	Submersible	30 HP
4	Borewell-05	Opposite of University Sr. Sec. Model School	Submersible	30 HP
5	Borewell-06	Near Girl Hostel No-13 Part-E	Submersible	30 HP
6	Borewell-07	Near Harsh Bhavan Boys Hostel	Submersible	30 HP
7	Borewell-08	Near Shooting range KUK	Submersible	30 HP



### 2.2 Water Accounting & Metering system:

It was observed that University has installed mechanical type water flow meters on Borewells to quantify per day ground water extraction from different sources. But Audit team observed that water meter was not in working condition.



Figure: -2.1 fresh water supply from Borewell for University campus



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**2.3 Water Storage Capacity in University Campus: -**

There are different types of tank available in University for water storage like Underground RCC tank, Overhead RCC tank and PVC tank (Sintex)

Table2.2: - Water Storage tank Phase-01 in KUK.

Sr. No.	Locations	10000 (Litter)	2000 (Litter)	1000 (Litter)	500 (Litter)	300 (Litter)	200 (Litter)
1	TF 1 – 32	0	0	7	2	0	0
2	BTH 1 – 26	0	0	3	2	0	1
3	D 1 -50	0	0	0	50	0	0
4	D 153 -164	0	0	10	0	0	0
5	MTH 1 – 24	0	0	5	0	0	2
6	F 1 – 5	0	0	0	4	0	4
7	F-5	0	0	0	1	0	0
8	E-1 to E-34	0	0	0	34	0	0
9	Teacher club	0	0	0	2	0	0
10	Health Centre	0	0	0	5	1	0
11	R.K Sadan	0	0	0	4	0	0
12	BEd College or Parking	0	0	3	1	0	1
13	UIET Workshop	0	3	2	0	0	0
14	UIET Department	0	2	1	1	0	0
15	Community Centre	0	3	3	1	0	0
16	Old Law	0	1	3	1	0	0
17	Computer Centre	0	0	3	3	0	0
18	Admin Block	0	0	2	0	0	0
19	R-I	0	0	4	0	0	0
20	R-II	0	4	0	0	0	0
21	R-III	0	0	2	0	0	0
22	Hotel Management	0	2	1	1	0	0
23	MBA	0	0	1	3	0	0
24	Ambedkar Bhawan	0	0	0	1	0	0
25	Fine Art	0	0	4	2	1	0
26	VC Office & Registrar Office	0	0	1	2	3	0
27	Commerce and University School of Management	0	0	0	2	1	0
28	Auditorium Hall	0	2	0	2	1	0
29	Darohar Old	0	0	3	2	0	0
30	Darohar New	0	0	0	3	0	0
31	Main Store	0	0	0	0	1	0
32	Law Canteen	0	0	0	0	1	0
33	Pension Cell	0	0	2	0	0	0
34	Centre for advanced research In Earthquake Studies	0	0	0	1	0	0



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35	Faculty G. House	0	2	4	0	0	0
36	Inter G. House	0	2	16	0	0	0
37	VC Residence	0	0	0	5	2	0
38	Botany Department	0	0	2	0	0	0
39	Electronic Department	0	0	1	1	0	0
40	Institute of Environmental Studies	0	4	0	0	0	0
41	IIE	0	0	2	0	0	0
42	IOM	0	0	1	0	0	0
43	Botany Park	0	0	1	1	0	0
44	Animal House	0	0	1	1	0	0
45	Coffee House	0	0	3	0	0	0
46	Old Art Faculty	0	0	4	0	0	0
47	New Art Faculty	0	4	0	0	0	0
48	Old Library	0	0	4	0	0	0
49	New Library	0	0	1	1	0	0
50	Rose Garden	0	0	0	1	0	0
51	B - Pharmacy	0	4	0	0	0	0
52	New Chemistry Department	1	0	0	0	0	0
53	Old Chemistry Department	1	0	0	0	0	0
54	USIC Department	0	0	1	1	0	0
55	Physics Department	1	0	0	0	0	0
56	Zoology Department	1	0	0	0	0	0
57	Mathematics Department	0	2	0	0	0	0
58	Central Canteen	0	0	1	0	0	0
59	Student Home	0	0	0	1	0	0
60	University College	0	4	1	2	0	0
61	University College Canteen	0	0	0	2	0	0
	<b>Total</b>	<b>4</b>	<b>39</b>	<b>103</b>	<b>146</b>	<b>11</b>	<b>8</b>



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Water Storage Tank Phase -02 in KUK.

Sr. No.	Locations	2000 Litter	1000 Litter	500 Litter	300 Litter	200 Litter	30000 Litter
1	Pratap Bhawan	1	8	0	6	0	0
2	Narhari Bhawan	1	9	0	6	0	0
3	Arjun Bhawan	0	5	0	1	0	0
4	Tagore Bhawan	0	2	2	2	0	0
5	Bhagat Singh	0	8	0	0	0	0
6	Bhima Bhawan	0	3	0	0	0	0
7	Devi Lal Bhawan	0	4	0	0	0	0
8	Ambedkar Bhawan	0	2	1	0	0	0
9	Ranbir Bhawan	0	4	3	0	0	0
10	Harsh Bhawan	0	5	1	2	0	0
11	Vivekananda Bhawan	0	4	0	0	0	0
12	Subhash Bhawan	1	6	6	0	0	0
13	Saraswathi Bhawan	7	3	2	0	1	0
14	Meera Bhawan	10	0	1	0	1	0
15	Kasturba Bhawan	7	6	1	0	1	0
16	Bharti Bhawan	7	2	0	0	1	0
17	Gargi Bhawan	9	1	1	0	1	0
18	Subhadra Bhawan	1	3	1	0	1	0
19	Aahilya Bhawan	0	7	0	1	0	0
20	Ganga Bhawan	2	0	1	0	0	0
21	Uttara Bhawan	0	9	1	0	0	0
22	Devyani Bhawan	2	5	2	0	0	0
23	Kalpana Chawla Bhawan	0	5	1	0	0	0
24	Laxmi Bhawan	0	2	4	0	0	0
25	Yamuna Bhawan	0	2	1	0	0	1
26	D-129 to D - 152	0	0	24	0	0	0
27	E-62 to E -73	0	0	15	0	0	0
28	E-46 to E-61	0	0	33	0	0	0
29	E-35 to E-37	0	0	6	0	0	0
30	E-38 to E-45	0	0	16	0	0	0
31	D-51 to D-70	0	0	20	0	0	0
32	D-72 to D-100	0	0	29	0	0	0
33	New Gym	0	0	3	0	0	0
34	Old Gym	0	0	2	0	0	0
35	Sports Ground	0	0	2	1	0	0
36	DDC	0	2	0	1	2	0
37	New DDC	0	4	1	0	0	0
38	Power House	0	0	1	0	0	0
39	Electricity Board	0	0	1	0	0	0
40	Mass Communication	0	0	3	0	0	0



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41	Girls Hostel Barrier	0	0	1	0	0	0
42	KR-1 to KR-24	0	0	6	0	0	0
43	KR General Washroom	0	0	1	0	0	0
44	KR-25 to KR-40	0	0	4	0	0	0
45	C-1 to C-20	0	0	20	0	0	0
46	C-21 to C-40	0	0	20	0	0	0
47	C-41 to C-60	0	0	20	0	0	0
48	C-61 to C-100	0	0	40	0	0	0
49	C-105 to C-140	0	0	35	0	0	0
50	BC-1 to BC-4	0	0	4	0	0	0
51	A-1 to A-6	0	0	6	0	0	0
52	H-1 to H-196	0	0	30	50	0	0
53	University Market	0	0	1	0	0	0
54	SBI Bank	0	0	1	0	0	0
55	Post office	0	0	1	0	0	0
56	Non-Teaching Club	0	0	2	0	0	0
	Total	48	111	377	70	8	1



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#### 2.4 Water use areas in University Campus: -

Water is preliminary used for drinking, domestic, gardening and clinical activity. Audit team visited various departments and buildings to determine appliances. The details of washrooms, toilets and taps are given in table.

Table: 2.3 Details of various water Taps in Girls Hostel

Sr. No	Area Name	OWC	EWC	Geysers	Pillar Cock	Bib Cock	Shower	Concealed / stop cock	Hydrants	Urinal	Total
1	G. Hostel No. 1	24	12	17	37	125	34	34	3	0	286
2	G. Hostel No. 2	24	11	17	37	119	35	35	3	0	281
3	G. Hostel No. 3	24	12	17	37	119	35	35	4	0	283
4	G. Hostel No. 4	24	11	17	37	119	35	35	3	0	281
5	G. Hostel No. 5	23	12	17	28	146	35	35	3	0	299
6	G. Hostel No. 6	23	3	14	28	90	25	25	4	0	212
7	G. Hostel No. 7	1	24	23	55	88	25	48	1	0	265
8	G. Hostel No. 8	12	2	5	16	51	13	13	2	0	114
9	G. Hostel No. 9	46	23	26	50	245	70	70	4	0	534
10	G. Hostel No. 10	31	12	20	32	157	46	46	2	0	346
11	G. Hostel No. 11	20	14	11	44	115	33	33	2	0	272
12	G. Hostel No. 12	23	12	11	44	115	40	40	3	0	288
13	G. Hostel No. 13	15	28	25	54	173	48	48	1	0	392





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14	G. Hostel Market (Complex)	2	0	0	3	5	0	0	0	0	10
15	G. Hostel Canteen	1	0	1	1	5	0	0	0	0	8
16	Guest House	0	2	2	2	8	2	2	0	0	18
17	Hostel Dispensary & Gym	3	2	0	3	9	0	0	0	0	17
18	Servant Qtr. (G.H)	7	1	0	9	26	0	0	0	0	43
20	Security Room - I, II (G.H)	2	0	0	3	8	0	0	0	2	15
	<b>Total</b>	<b>305</b>	<b>181</b>	<b>223</b>	<b>520</b>	<b>1723</b>	<b>476</b>	<b>499</b>	<b>35</b>	<b>2</b>	<b>3964</b>



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Table 2.4 :- Details of Various water Taps in Boys Hostel

Sr. No	Area Name	OWC	EWC	Geyser	Pillar Cock	Bib Cock	Shower	Hydrants	Urinal	Total
1	Narhari Hostel	32	30	17	63	188	60	4	46	440
2	Pratap Hostel	32	30	17	65	192	60	2	46	444
3	Bhima Hostel	32	2	17	30	103	1	1	13	199
4	Subhash Bhawan	0	17	16	38	55	2	16	0	144
5	Ambedkar Bhawan	8	5	6	1	46	1	0	8	75
6	Tagore Bhawan	25	3	12	23	93	4	27	22	209
7	Ranbir Bhawan	29	15	14	35	134	2	38	19	286
8	Devi Lal Bhawan	15	13	7	24	99	0	3	16	177
9	Police Post	0	1	0	1	1	0	0	0	3
10	Bhagat Singh Bhawan	33	20	17	74	174	1	1	33	353
11	Power House No. -3	1	0	0	1	2	0	0	0	4
12	Vivekanand Bhawan	10	5	7	15	53	0	3	12	105
13	Harsh Bhawan	32	16	17	35	162	46	4	36	348
14	Arjun Bhawan	20	1	11	26	74	21	3	21	177
15	New Servant Qtr ( Behind Arjun Bhawan )	6	0	0	2	14	0	0	0	22
16	Old Servant Qtr (i)	1	0	0	1	3	0	0	0	5
17	Old Servant Qtr (ii)	5	0	0	0	7	0	0	0	12
18	New Block (ii)	8	0	0	2	16	0	0	0	26
19	Extra 14,16, 18 Qtr.	9	1	-	12	40	0	0	0	62
20	Servant Qtr. (Near Tagore Bhawan )	10	0	0	2	52	0	0	0	64
	<b>Total</b>	<b>308</b>	<b>159</b>	<b>158</b>	<b>450</b>	<b>1508</b>	<b>198</b>	<b>102</b>	<b>272</b>	<b>3155</b>



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Table 2.5 :- Details of Various water Taps in Residential Area

Sr. No.	Particular	Pillar Cock	OWC/EWC	Taps	JET	Water Cooler	Urinal	Stop Cock / Consoled	Shower	Hydrants	Total
1	Rose Garden	3	6	18	3	1	2	0	0	8	<b>41</b>
2	M.T.H (1 TO 24)	48	26	73	26	0	0	24	24	1	<b>222</b>
3	B.T.H ( 1 TO 24)	24	24	120	24	0	0	24	24	1	<b>241</b>
4	B.T.H ( 25 TO 26)	4	3	13	1	0	0	2	2	0	<b>25</b>
5	Teacher Flat (1 to 32)	64	64	265	34	0	0	64	64	1	<b>556</b>
6	D-1 To D-50	100	100	600	50	0	0	100	100	0	<b>1050</b>
7	D 153 To D 164 Stilt Floor	53	77	188	41	0	0	41	41	0	<b>441</b>
8	F -Type ( 1 to 05)	20	15	40	15	0	0	15	15	0	<b>120</b>
9	F -Type (1 to 05) Waiter Room	-	5	7	-	0	0	0	0	0	<b>12</b>
10	E - 1 to E- 30, E-33 & E-34	147	127	535	86	0	0	79	79	32	<b>1085</b>
11	Old Rest House	6	6	21	6	5	0	15	5	0	<b>64</b>
12	Rest House	51	69	175	62	1	7	192	52	5	<b>614</b>
13	V.C. Residence	6	6	19	5	2	2	3	3	4	<b>50</b>
	<b>Total</b>	<b>526</b>	<b>528</b>	<b>2074</b>	<b>353</b>	<b>9</b>	<b>11</b>	<b>559</b>	<b>409</b>	<b>52</b>	<b>4521</b>



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Sr. No	Area Name	OWC	EWC	Geyser	Pillar Cock	Shower	Stop Cock	Hydrants	Toilet (Bath) W.C. Sink Tap	Total
1	A-1 to a-6	6	0	1	6	6	6	0	24	49
2	BC-1 to BC - 4	2	4	3	4	4	4	0	22	43
3	C-1 to C-20	20	20	40	40	40	40	0	197	397
4	C-21 to C-40	20	20	24	32	32	32	0	116	276
5	C-41 to C-60	20	20	32	40	40	40	0	192	384
6	C-61 to C-80	20	20	32	40	40	40	0	192	384
7	C-81 to C-100	20	20	33	40	40	40	0	193	386
8	C-105 to C-124	20	20	36	40	40	40	0	197	393
9	C-125 to C-140	16	16	23	32	32	32	0	174	325
10	CF -1 to CF-4 (Near NCC)	4	0	2	4	4	4	0	12	30
11	CF -1 to CF-4 (Near Residence Quarters)	4	0	2	4	4	4	0	12	30
12	CI-1 to CI -48	48	48	96	100	96	96	0	436	920
13	H-1 to H-15	12	3	0	15	15	15	0	75	135
14	D-51 to D-62	9	27	24	26	24	24	0	158	292
15	D-63 to D-70	8	16	16	17	16	16	0	96	185
16	D-72 to D-78	4	10	14	21	14	14	0	72	149
17	D-79 to D-94	12	20	20	51	32	35	0	152	322
18	D-95 to D-100	0	12	6	18	12	14	0	60	122
19	D-101 to D-106	2	10	12	20	12	14	0	74	144
20	D-101A to D-101C	1	3	6	12	6	12	1	30	71
21	D-129 to D-152	24	24	48	96	48	96	0	290	626
22	D-107 to D-112	4	8	12	30	12	24	0	52	142
23	D-113 to D-118	4	9	12	31	13	25	0	56	150
24	D-119 to D-124	4	8	12	30	12	24	0	53	143



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25	D-125 to D-128	3	5	8	20	8	16	0	30	90
26	E-62 to E-73	2	37	37	76	38	76	0	192	458
27	E-54 to E-61	0	16	16	40	16	32	0	80	200
28	E-46 to E-53	2	16	16	43	18	34	0	92	221
29	E-35 to E-45	11	22	22	56	33	40	0	145	329
30	E-31 to E-32	4	0	2	4	4	4	0	18	36
31	H-16 to H-30	13	2	0	15	15	15	0	75	135
32	H-115 to H-129	12	3	3	15	15	15	0	78	141
33	H-130 to H-144	15	0	0	15	15	15	0	66	126
34	H-31 to H-45	15	0	3	15	15	15	0	66	129
35	H-46 to H-60	15	0	0	15	15	15	0	60	120
36	H-61 to H-69	9	0	2	9	9	9	0	42	80
37	H-70 to H-84	15	0	0	15	15	15	0	60	120
38	H-85 to H-99	15	0	0	15	15	15	0	60	120
39	H-100 to H-114	15	0	2	15	15	15	0	64	126
40	H-155 to H-164	7	3	3	10	10	10	0	56	99
41	H-181 to H-196	15	1	2	16	16	16	0	66	132
42	H-145 to H-152	8	0	0	8	8	8	0	32	64
43	H-165 to H-174	10	0	0	10	10	10	0	40	80
44	K.R -01 to K.R-24	24	0	1	19	3	3	0	96	146
45	K.R -25 to K.R-28	4	0	1	4	2	2	0	16	29
46	K.R -29 to K.R-32	4	0	2	4	4	4	0	16	34
47	H-175, 176, 153,154	4	0	1	4	4	4	0	16	33
48	K.R-33 to K.R-36	4	0	0	4	2	2	0	16	28
49	H-177 to H-180	4	0	1	4	1	1	0	20	31
50	K.R 37 to K.R 40	4	0	0	4	0	0	0	16	24
51	Common Toilet K.R	6	0	0	2	0	0	0	38	46
									<b>Total</b>	<b>9275</b>



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Table 2.6 :- Details of Various water Taps in various Buildings

Sr. No.	Area Name	Pillar Cock	OWC/EWC Cistern	Taps	EWC JET	Water Cooler	Urinal	Stop Cock / Consoled	Shower	Total
1	Faculty Lounge	6	6	8	4	0	3	0	0	27
2	V.C office & Registrar office	19	17	42	16	2	5	18	0	119
3	Adm. Block	32	20	38	9	4	12	-	0	115
4	Computer Dept. (DEAN Build.)	40	51	59	27	6	19	12	0	214
5	Conduct Branch	7	5	12	3	1	2	-	0	30
6	Exam -I	25	26	50	13	4	21	12	0	151
7	Exam -2	53	47	58	32	6	35	30	0	261
8	Exam-3	14	18	20	8	1	7	5	0	73
9	Ambedkar Bhawan	7	7	15	5	1	4	0	0	39
10	Social Work Dept.	14	14	18	7	1	11	0	0	65
11	Tourism& Hotel Management	24	22	46	14	3	15	0	0	124
12	Auditorium Hall	33	24	44	12	2	22	0	0	137
13	Dharoher I & II	15	24	26	18	2	5	0	0	90
14	Museum 1857	9	9	11	9	-	8	0	10	56
15	Fine Art	18	27	47	23	2	17	12	0	146
16	Commerce & Uni. School of Mgmt.	23	66	31	6	8	11	0	0	145
17	Pub. Toilet	3	5	6	0	0	2	2	0	18
18	2nd Gate Toilet	0	0	4	0	2	0	0	0	6
19	Main Library	22	23	31	9	3	23	0	0	111
20	Jublee Hall	31	30	44	20	5	20	0	0	150



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21	New Art Faculty	27	15	24	11	3	15	0	0	95
22	Old Art Faculty Dept.	27	30	47	12	4	20	0	0	140
23	Coffee House	4	3	10	2	2	0	0	0	21
24	Chief Warden Off. Boys & Girls	2	2	4	2	0	0	0	0	10
25	Modern Chem. Lab	27	21	227	12	1	27	101	0	416
26	Chemistry Dept.	9	7	162	6	2	6	152	0	344
27	USIC Dept.	12	9	23	5	2	8	-	0	59
28	Physics Dept.	10	9	83	4	3	12	78	0	199
29	Zoology Forensic Science lab	5	5	18	5	1	2	0	0	36
30	Zoology / Maths / Geography Dept.	13	16	107	9	3	11	83	0	242
31	B. Pharmacy	17	17	191	10	5	8	456	0	704
32	IIE	13	11	13	7	1	4	0	0	49
33	ION Beam Centre	4	5	10	4	2	2	0	0	27
34	Public Admin / Eng. Statistics	27	27	41	15	4	20	0	0	134
35	Geophy / Phycology / Women Study	15	15	27	9	3	9	0	0	78
36	Dept. Geo Physics & Music	40	32	47	16	5	12	0	0	152
37	IIHS	32	16	64	5	2	14	63	0	196
38	Central Canteen	2	2	2	1	1	1	0	0	9
39	Student Home & Empl. Bureau	2	4	8	3	1	1	0	0	19



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40	B Ed College	13	12	21	0	2	10	1	1	60
41	R.K. Sadan	7	7	7	5	0	2	0	0	28
42	3rd Gate Toilet	2	4	8	2	1	3	0	0	20
43	Parking Toilet	4	5	7	2	1	4	2	0	25
44	UIET Workshop	36	29	66	21	4	16	0	0	172
45	UIET Dept.	40	73	169	35	9	38	91	0	455
46	Community Centre	21	17	52	14	1	8	18	11	142
47	Institute of Law	26	46	50	33	4	9	27	0	195
48	Botany Dept. & Home Science Dept	13	13	160	7	2	11	104	0	310
49	Elect. Sci. / Geology Dept.	13	13	85	7	3	9	66	0	196
50	Animal House	5	5	39	2	1	0	33	0	85
51	Bio Chem./ Biotech / Micro Biology Dept	13	13	94	7	3	10	81	0	221
52	Institute of Environmental Studies	32	33	33	23	3	15	0	0	139
53	University Health Centre	19	13	35	7	1	1	2	0	78
54	Teacher Club	5	4	13	3	1	2	2	2	32
	<b>Total</b>	<b>932</b>	<b>956</b>	<b>2557</b>	<b>524</b>	<b>134</b>	<b>552</b>	<b>1451</b>	<b>24</b>	<b>7130</b>





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Sr. no	Area Name	OWC	EWC	Geyser	Pillar Cock	Bib cock	Shower	Hydrants	Urinal	Total
1	New Multimedia (Block-C)	4	4	0	8	8	0	0	4	28
2	B. Tech (Block-B)	1	2	0	3	7	0	0	1	14
3	Old D.C.C.	6	8	0	15	25	0	3	8	65
4	Sports Ground	4	3	0	7	16	3	9	4	46
5	New Mass Comm.	4	8	0	11	14	0	0	6	43
6	University Model Sr. Sec. School	11	6	0	19	65	0	7	6	114
7	New D.C.C	10	12	0	22	37	0	0	12	93
8	Mass Studio	2	2	0	2	6	0	0	0	12
9	Farm House	1	1	2	2	14	2	1	0	23
10	Dept. of Phy Edu.	8	7	2	17	41	4	0	8	87
11	Non-Teaching	4	-	-	3	10	1	0	0	18
12	Post office	1	2	1	4	10	1	0	2	21
13	Construction Branch	2	5	0	5	12	0	1	5	30
14	Press	2	3	0	7	11	0	0	5	28
15	Shop No. 1 to 9, 10,11,55	3	7	0	6	30	0	0	2	48
16	SBI Bank	0	2	0	1	5	0	0	2	10
17	Shop No. 30 to 43	0	0	0	0	2	0	0	0	2
18	Market Common Toilet/ Sink	3	1	0	3	9	0	0	3	19
19	Shop No. 44 to 53	0	0	0	1	0	0	0	0	1
20	Shop No. 12 to 29	0	0	0	1	0	0	0	0	1
21	Power House No. (1 & 4)	1	1	0	1	9	0	1	1	14
22	T. W No. 3,5,6,7,8	3	0	0	4	22	1	2	0	32
<b>Total</b>										749



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### 2.5 Fresh Water uses for Gardening:

An irrigation sprinkler (also known as a water sprinkler or simply a sprinkler) is a device used to irrigate (water) agricultural crops, lawns, landscapes, golf courses, and other areas. They are also used for cooling and for the control of airborne dust. KUK is using Water Sprinkler system for garden and lawns. **It is appreciable.**



Figure: - KUK using Sprinkler system for garden and lawn

The one of major contribution from fresh water consumption is watering for plants and garden in University campus. There is good potential for water saving by adopting “Automatic Watering 360 adjustable misting nozzle irrigation Dripper’s system” for plants. Adjustable drip irrigation tools provide different amounts of water depending on the water requirements of different plants. The drip speed can be set accordingly for indoor and outdoor plants.



Fig: 2.5 Proposed Drip irrigation Technology for Plants area.

## 2.6 Waste Water Generation sources: -

At present, waste water generated from various departments, canteen, Mess, hostels and other activities like washrooms, handwash and washing of medical equipment's and RO rejected etc is treated in STP plant in University.

Table: - 2.7 Waste water generation area in University campus

Sr. No	Key Water Usage Section	Type of water used (raw, treated etc.)	Water Consuming activities
1	Admin Block	Fresh Water	Drinking and other uses
2	Hostels	Fresh Water	Drinking, Food cooking, other Uses
3	Institution Buildings	Fresh Water	Drinking and other uses
4	Canteens	Fresh Water	Food cooking, drinking
5	Residential	Fresh Water	Drinking, domestic and other activities

Some photographs of waste water generation sources are given



Figure: -2.6 Waste Water Generation sources



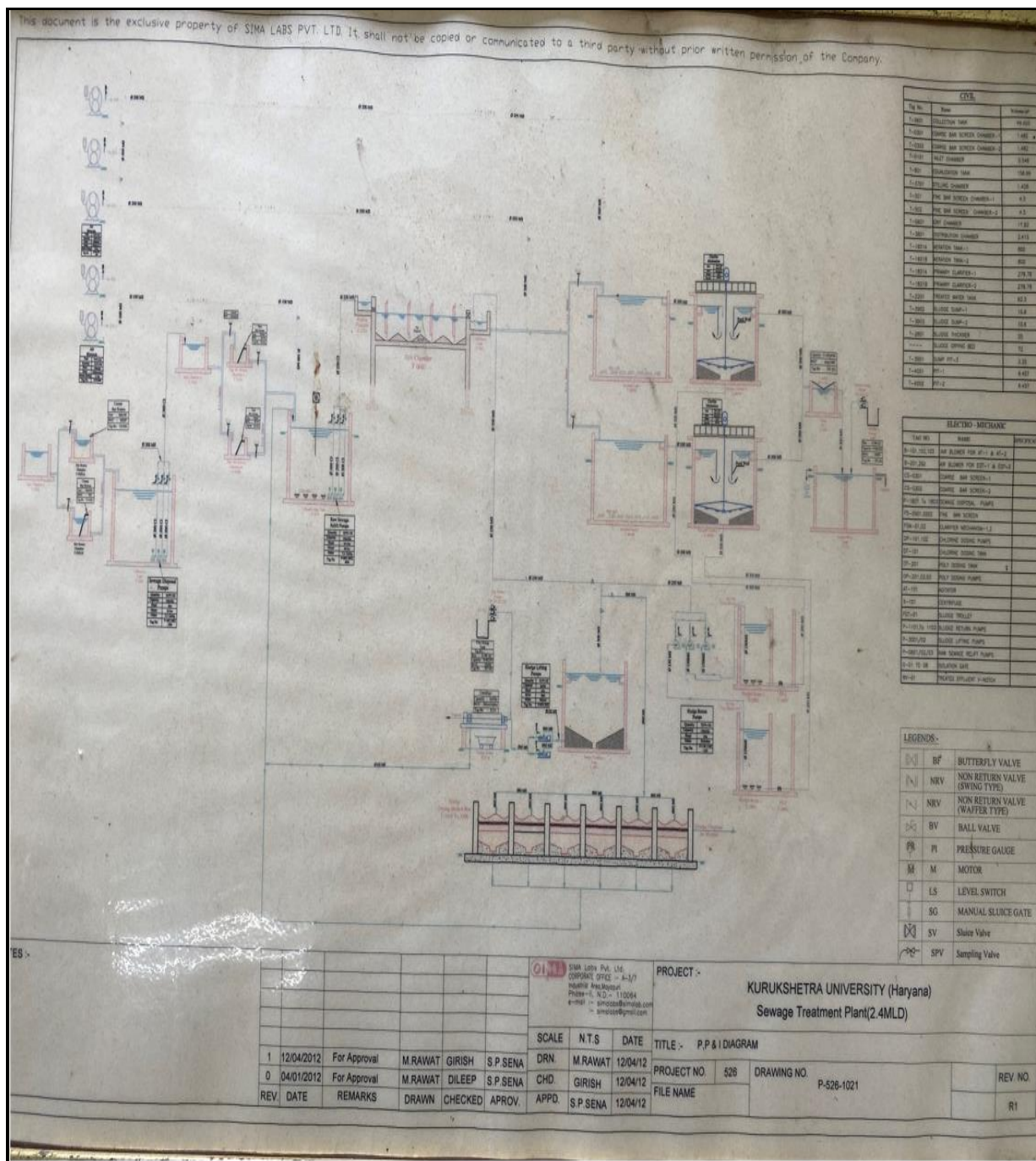
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## 2.7 Water Treatment Plant in KUK: -

✚ **STP PLANT:** -University has installed 2.4 MLD Sewage Treatment Plant (STP) for waste water treatment in University premises. Environment audit team visited STP plant area and found out that STP treated water are drained in open area.

## Design layout of STP Plant in KUK: -

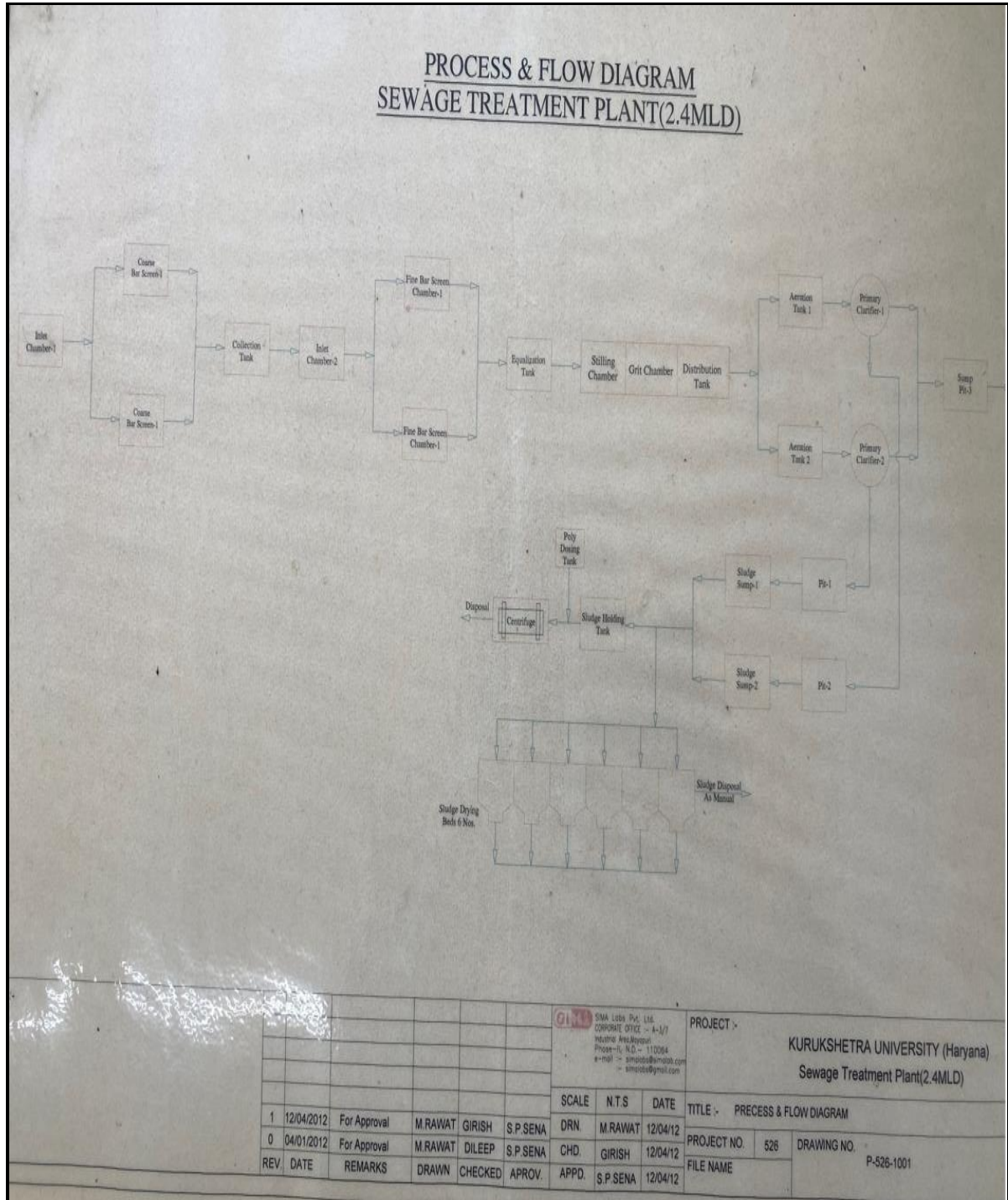




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**Process and water flow diagram of STP plant: -**





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**Some Photograph of STP Plant: -**





**ON SITE WATER FLOW MEASUREMENT IN STP PLANT: -**



Figure :- Water Measurement on University outlet for STP





Figure: - Flow Measurement on STP primary Pump

**PRPOSED ETP PLANT: -**

University has installed one STP plant for waste water treatment. **It is Applicable.** Environment audit team visited in some departments in KUK they use various chemicals in Lab for experiment activities.

Table 2.8:- Details of departments that use Chemicals in laboratory: -

Sr. NO	Department Name	Purpose
1	Chemistry Department	Lab Activity
2	Botany Department	Lab Activity
3	Zoology Department	Lab Activity
4	Biochemistry Department	Lab Activity
5	Microbiology Department	Lab Activity
6	Biotechnology department	Lab Activity
7	Institute of Environment Science	Lab Activity
8	Pharmaceutical Science	Lab Activity
9	IIHS KUK	Lab Activity

Effluent treatment plant cleans industrial effluents, contaminated water from outlet pipes, reservoir, rivers, lakes etc and reclaims the water resource for using in different purposes. ETPs are mostly installed in industries like textile industry, Medicine manufacturing, leather industry, and chemicals industry.

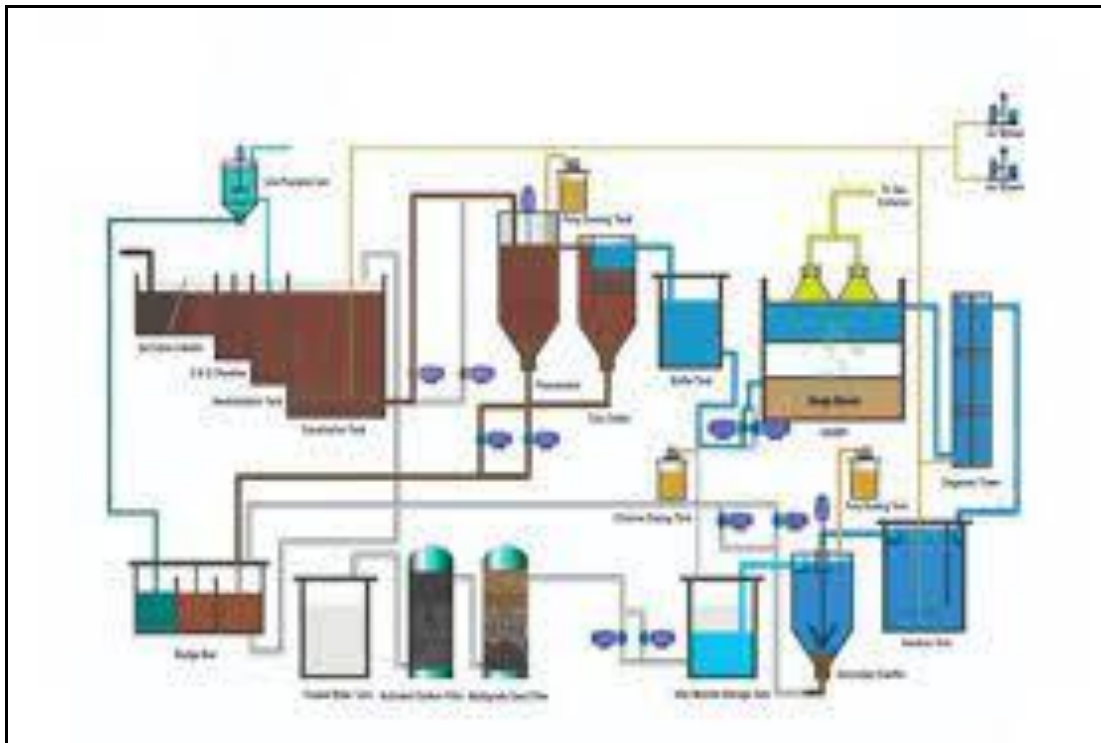


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The principle of operation of ETP is Physico-Chemical treatment followed by Polishing Treatments like –Sand Filtration, Activated Charcoal treatment (Adsorption), Ozonisation (Chemical Oxidation), Ultra Filtration (UF), Reverse Osmosis (RO) and evaporation.

It works by using aeration and flocculation together. As we have seen, wastewater flows into an aeration tank and mixed with water during aeration. Afterward, the wastewater flows into a settling tank or secondary clarifier.





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**Recommendation: -**

It is highly recommended to separate all drain water lines that departments use for chemicals discharge from lab activities and proposed to connect to ETP plant for treatment of chemical contaminated water.

**2.8:- On site water Measurement in all borewell:-**

Table 2.9: - Water Flow measurement on Borewells

Sr. No	Source of Water	Location	Measured Flow (M <sup>3</sup> /hr)	Rated (HP)	Type of Pumps
1	Borewell-02	Rose Garden	60	30 HP	Submersible
2	Borewell-03	Near Ambedkar Bhavan Hostel	70	30 HP	Submersible
3	Borewell-04	University 3 <sup>rd</sup> . Gate	38	30 HP	Submersible
4	Borewell-05	Opposite of University modal school	112	30 HP	Submersible
5	Borewell-06	Near Girl Hostel No-13 Part-E	71	30 HP	Submersible
6	Borewell-07	Near Harsh Bhavan Boys Hostel	91	30 HP	Submersible
7	Borewell-08	Near Shooting range KUK	58	30 HP	Submersible



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**2.9 Water test report of ground water in KUK University: -**

PUBLIC HEALTH ENGINEERING DEPARTMENT, HARYANA	
Payment Receipt Of Water Sample Test (Consumer Copy)	
Test ID : S309	Date : 06-Oct-2020 11:35:27 AM
Received from : S.D.O(P.H) K.U.K	Lab Name : KURUKSHETRA
District : KURUKSHETRA	Chemist : SMT. NISHA SAINI
Town : Kurukshetra (Thanesar)	Sample Location : UNIVERSITY CAMPUS
Ward : 25	Address :
By : Online Payment	
Online Transaction No. : S0ba6b83f4a3a74132a1	GRN No. : 68052791
Test Name: Physical & Chemical Test	
Test Parameter	
Total Dissolved Solids	
Total Hardness as CaCo3	
Calcium as Ca	
Magnesium as Mg	
Iron as Fe	
Chloride as Cl	
Sulphate as So4	
Flouride as F	
Nitrate as No3	
pH	
Alkalinity	
Color	
Odour	
Taste	
Turbidity	
Free Residual Chlorine	
Rs. 250 ( In words TWO HUNDRED AND FIFTY only)	



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Govt. of Haryana  
 Public Health Engineering Department, Water Testing Laboratory, Kurukshetra.  
 Jal Bhawan, Sector 10 Kurukshetra-136118  
 Email id: chemist.kkra@gmail.com Ph.No.01744-226651

**Test Report**

Test Report No. KKR/00768 /10/2020  
 Issued To S.D.O. (P.H.) K.U.K. Kurukshetra.  
 Customer Reference No. 1292355/ 06.10.2020  
 Sample Description Water  
 Sample Type Chemical Analysis  
 Sample collected on dated 06.10.2020  
 Sample Collected by Ankit Kumar J.E.  
 Sample received on dated 06.10.2020  
 Sample Location University Campus, Kurukshetra.  
 Date of Analysis started 06.10.2020  
 Dated of analysis completed 07.10.2020

Memo No. 605  
 Date: 07/10/2020

314/S.D.O. (PH)  
 7/10/2020

S. No.	Parameter	Protocol Used	Results Mg/l	IS:10500:2012(Second Revision)		Unit
				Desirable limit	Max. Permissible limit (in absence better alternate source)	
1	Total Dissolved Solids(TDS)at 180°C	IS.3025 (Part 16)1984Reaffirmed)2017	556	500	2000	mg/L
2	Total Hardness	IS.3025 (Part 21)2009Reaffirmed)2014	320	200	600	mg/L
3	Calcium (as Ca)	IS.3025 (Part 40)1991Reaffirmed)2014	78.15	75	200	mg/L
4	Magnesium (as Mg)	IS.3025 (Part 46)1994Reaffirmed)2014	30.43	30	100	mg/L
5	Total Alkalinity	APHA 2320 B Part B Titration method	310	200	600	mg/L
6	Chloride (as Cl)	IS.3025 (Part 32)1988Reaffirmed)2014	67.35	250	1000	mg/L
7	Fluoride (as F)	APHA 4500- F Part C ion selective method	Less than 1	1.0	1.5	mg/L
8	Nitrate (as NO3)	APHA4500-NO <sub>3</sub> Part D Ion Meter electrode	0.6	45	45	mg/L
9	pH	IS.3025 (Part 11)1983Reaffirmed)2017	7.72	6.5 to 8.5	No relaxation	—

Opinion: - The Parameter Tested at Sr.No. .1 to 9 in the test report meets the requirement of IS 10500:2012 (Second revision)

Notes:

- The results given above are related to the sample as received and tested in PHED Lab, Kurukshetra. Reliability of sample lies with sender.
- The test report can't be regenerated/re-produced in whole or in part without written permission of Laboratory
- The test report can't be used for any publicity or any legal purpose
- The test samples meant for chemical analysis will be disposed off after 15 days from the date of issue of test report unless until specific requested by the customer for retaining over a longer period

Sample analyzed by (Shreenu Sharma)  
 Work done by CRE Bullaha at KKR  
 For KRO information in  
 XPH  
 07/10/2020

(Nisha Saini)  
 Authorized Signatory/Chemist  
 PHED Water Testing Laboratory, Kurukshetra  
 Water Testing Lab, Kurukshetra

Shreenu Sharma  
 Const Purpose

END OF TEST REPORT



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**Govt. of Haryana**  
**Public Health Engineering Department, Water Testing Laboratory, Kurukshetra.**  
**Jal Bhawan, Sector 10 Kurukshetra-136118**  
 Email id: [chemist.kkra@gmail.com](mailto:chemist.kkra@gmail.com) Ph.No.01744-226651

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**Test Report**

Test Report No.	KKR/00768 /10/2020
Issued To	S.D.O. (P.H.) K.U.K. Kurukshetra. 1292355/ 06.10.2020
Customer Reference No.	Water
Sample Description	Chemical Analysis
Sample Type	06.10.2020
Sample collected on dated	Ankit Kumar J.E.
Sample Collected by	06.10.2020
Sample received on dated	University Campus, Kurukshetra.
Sample Location	06.10.2020
Date of Analysis started	07.10.2020
Dated of analysis completed	

S. No.	Parameter	Protocol Used	Results Mg/l	IS:10500:2012(Second Revision)		Unit
				Desirable limit	Max. Permissible limit (in absence better alternate source)	
09	Sulphate as SO <sub>4</sub> (*)	APHA4500-SO <sub>4</sub> E	30 ✓	200	400	mg/L
10	Iron as Fe (*)	APHA3500-Fe B	0.05 ✓	1.0	No relaxation	mg/L

**Opinion:** The Parameter Tested at Sr.No. .09 to 10 in the test report meets the requirement of IS 10500:2012 (Second revision).

**Notes:**

- The results given above are related to the sample as received and tested in PHED Lab, Kurukshetra. Reliability of sample lies with the sender.
- The test report can't be regenerated/re-produced in whole or in part without written permission of Laboratory.
- The test report can't be used for any publicity or any legal purpose.
- The test samples meant for chemical analysis will be disposed off after 15 days from the date of issue of test report unless until specifically requested by the customer for retaining over a longer period.

Sample analyzed by (Sheenu Sharma)

CHEMIST (Nisha Saini)  
 Public Health Authorized Signatory/CHEMIST  
 PHED Water Testing Laboratory, Kurukshetra

For information Mr. [Signature] 8/10/2020

[Signature] 8/10/2020

**END OF TEST REPORT**





## CHAPTER- 3 WASTE MANAGEMENT

### 3.1 About Waste:

Human activities create waste, and it is the way these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and to public health. Waste management is important for an eco-friendly campus. In University, different types of wastes are generated, the collection and management of which is very challenging.

Solid waste can be divided into three categories: bio-degradable, non-biodegradable and hazardous waste. A bio-degradable waste includes food wastes, canteen waste, wastes from toilets etc. Non-biodegradable wastes include what is usually thrown away in homes and schools such as plastic, tins and glass bottles etc. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals, acids and petrol.

Unscientific management of these wastes such as dumping in pits or burning them may cause harmful discharge of contaminants into soil and water supplies, and produce greenhouse gases contributing to global climate change respectively. Special attention should be given to the handling and management of hazardous waste generated in the University. Bio-degradable waste can be effectively utilized for energy generation purposes through anaerobic digestion or can be converted to fertilizer by composting technology. Non-biodegradable waste can be utilized through recycling and reuse. Thus the minimization of solid waste is essential to a sustainable University. The auditor diagnosed the prevailing waste disposal policies and suggested the best way to combat the problems.

Table 3.1 Different types of waste generated in the University Campus.

Sr. No.	Types of Waste	Particulars
1	Solid wastes	Damaged furniture, paper waste, paper plates, food wastes etc.
2	Plastic waste	Pen, Refill, Plastic water bottles and other plastic containers, wrappers etc.
3	E-Waste	Computers, electrical and electronic parts etc.
4	Glass waste	Broken glass wares from the labs etc.
5	Chemical wastes	Laboratory waste etc.
6	Bio-medical Waste	Sanitary Napkin etc.



### 3.2 Waste management Practices adopted by the University

- ✚ University has adopted “One dust Bin” waste collection system. All kinds of waste generated from various activities is collected in single bin and all the dustbins are filled in a trolley and collected at one place.



Figure3.1 : - Waste collection bin in KUK University

**Recommendation:**

It is recommended to adopt 3 Bin Waste Collection System for collection of different types of waste generated in University premises.



Figure 3.2: - Recommended 3 Dust Bin waste collection System

**3.3 Waste Collection Points in University: -**

Audit team also visited various departments, canteen, and residential area to find out waste generation area and waste collection points for further improvement. Details are given in the table.

Table: 3.2 Details of Waste collection Dust bin system in KUK University

Sr. No	Area	Dust Bin (Type )	No of Dust Bin
1	Girls Hostel	Big (Stationary Type)	10
2	Girls Hostel	Small type (Portable)	09
3	Boy Hostel	Big (Stationary Type)	10
4	Boy Hostel	Small type (Portable)	10
5	University market and Residential area	Big (Stationary Type)	12
6	Near Departments in KUK campus	Big (Stationary Type)	14
7	Gardens Area	Small type (Portable)	130
<b>Total Area</b>			<b>195</b>



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**3.4 Organic Waste Generation in University: -**

Audit Team also visited in sanitization department and discussed with sanitary officer about the waste collection process. University has approx. 2.5 Ton per day waste generation. Department wise Generated organic waste are as follows: -

Table: 3.3 Detailed of Organic Waste Generation in KUK

Sr. No	Building Name	Approx. Quantity (Kg)
1	Bheema Bhawan	25
2	Dr. B.R. Ambedkar Bhawan	30
3	Subhash Bhawan	27
4	Pratap Bhawan	35
5	Ch. Ranbir Singh Hostel	27
6	Narhari Bhawan	22
7	Ch. Devilal Bhawan	27
8	Shaheed Bhagat Singh Bhawan	28
9	Tagore Bhawan	30
10	Arjun Bhawan	26
11	Vivekanand Bhawan	30
12	Harsh Bhawan	28
13	Girls Hostel-1 (Saraswati Bhawan)	30
14	Girls Hostel-2 (Meera Bhawan)	27
15	Girls Hostel-3 (Kasturba Bhawan)	37
16	Girls Hostel-4 (Bharti Bhawan)	27
17	Girls Hostel-5 (Gargi Bhawan)	34
18	Girls Hostel-6 (Subhadra Bhawan)	35
19	Girls Hostel-7 (Ahilya Bhawan)	26
20	Girls Hostel-8 (Ganga Bhawan)	28
21	Girls Hostel-9 (Ultra Bhawan)	36
22	Girls Hostel-10 (Devyani Bhawan)	38
23	Girls Hostel-11 (Kalpna Chawla)	27
24	Girls Hostel-12 (Laxmi Bai)	30
25	Girls Hostel-13 (Yamuna Bhawan)	28
26	International Guest House	10
	<b>Total</b>	<b>748</b>

**Note: -**All Data are collected on Dated 10.03.2021 and 11.03.2021. At present all hostel are working 40 % to 60 % Strength due to covid- 19. The Waste quantity generation depends on occupancy of the Students.



**Recommended: Install Organic waste composting Machine in University: -**

An organic waste composting machine is an independent unit that facilitates the composting process and provides better composts. It takes waste as its input and provides manure as its output. Composting without an organic waste composting machine will take a considerable amount of time.





**About Composting Process: -**

Highly compact composting machine uses special microorganisms to break down and decompose all kinds of organic waste into compost within 24 hrs with a volume reduction of 85-90%. When organic waste is added to it, moisture is sensed by the humidity sensor, heater, mixing blades and an exhaust system.



**+ Recommendation: -**

University has a good potential to install organic converter.

## CHAPTER- 4 RAIN WATER HARVESTING SYSTEM

### 4.1. Rain water harvesting systems

The rainwater harvesting is a technique to capture the rainwater when it precipitates, store that water for direct use or charge the groundwater and use it later.

There are typically four components in a rainwater harvesting system:

- ✚ Roof Catchment.
- ✚ Collection.
- ✚ Transport.
- ✚ Infiltration or storage tank and use.

If rainwater is not harvested and channelized, it runoff quickly and flows out through storm-water drains. For storm-water management, the recharge pits, percolation pits and porous trenches are constructed to allow storm water to infiltrate inside the soil.

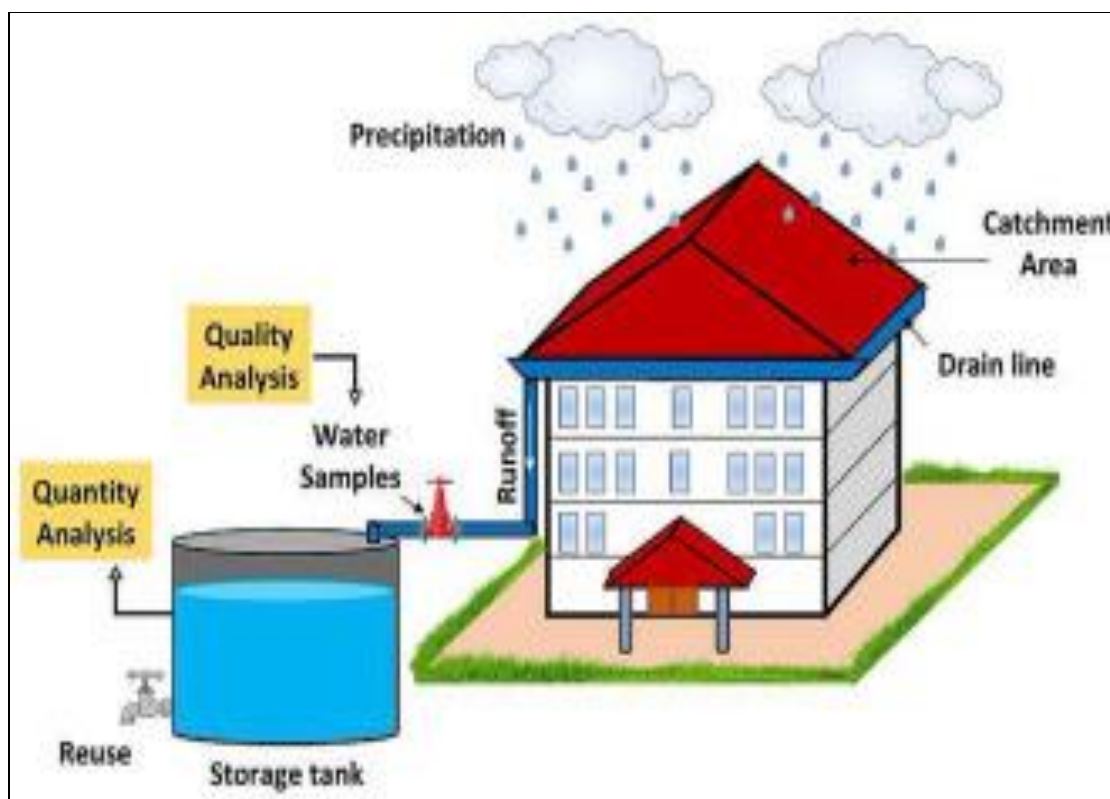


Figure: -4.1 Components of a rooftop rainwater harvesting system

#### 4.2 Rainwater harvesting system in KUK University:

University has installed 14 no of rain water harvesting systems and it is working by method of roof top rain water harvesting and by constructing recharge pit.

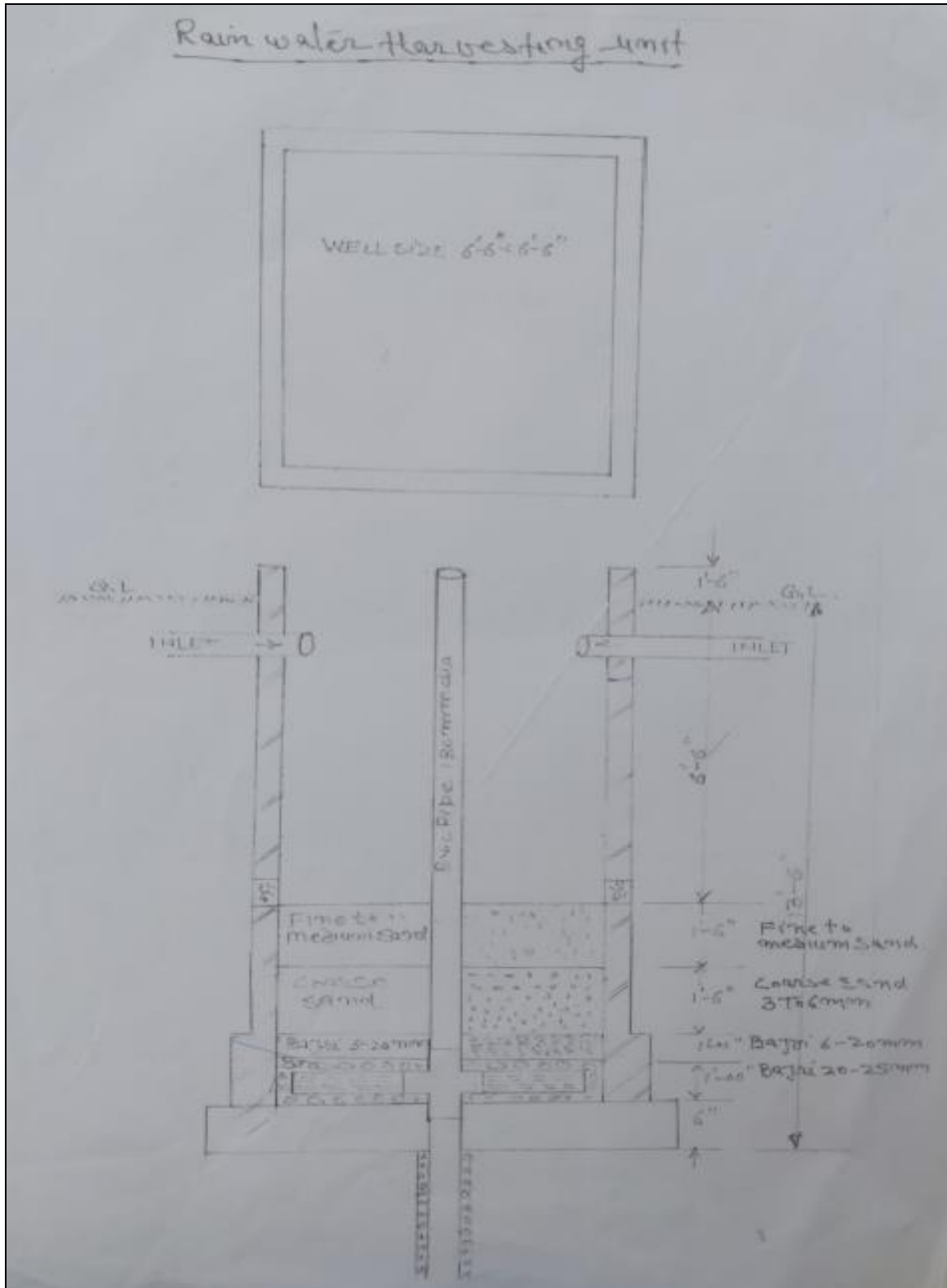
Table 4.1: -Details of RWH system in KUK :-

Sr. No	Area Name	Pit Quantity
1	University 2nd Gate (Near Toilet Block in Old Law)	1
2	3 rd Gate (MTH House Side)	1
3	RK Sadan Lawn	1
4	Geology Department	1
5	Uttra Bhavan (Girls Hostel No-09 )	2
6	Near Ganga Bhavan (Girls Hostel - 08 )	1
7	Challis Bag	1
8	Near Arjun Bhavan	1
9	Dharohar Phase- II	1
10	Exam-III	2
11	Shooting Range	2
<b>Total</b>		<b>14</b>





**4.3 Design of RWH in KUK:-**





4.4 Photograph of RWH in KUK :-



✚ Observation :-

University has 14 Nos RWH systems that are installed at various locations and additional units are also proposed. Its Applicable . There is good potential to install RWH system in remaining area in University.



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