

# WATER AUDIT

Conserve  
WATER



## DIT UNIVERSITY DEHRADUN

VILLAGE MAKKAWALA, MUSSOORIE DIVERSION ROAD, DEHRADUN (U.K.)

**CONDUCTED BY:**



**A-Z ENERGY ENGINEERS PVT. LTD.**

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## Introduction of Audit Team

We at A-Z Energy Engineers Pvt. Ltd are grateful to the management of DIT University for awarding the work of Water audit. We are especially thankful to top management. We also express our sincere gratitude to Mr. Alok Saxena and other members of team for their proactive approach and providing us well maintained relevant data required for audit. We are also thankful to the other concerned in charge of various departments for their cooperation during audit study at site and also the members of staff for their active involvement in audit on site study.

The following members of A-Z Energy Engineers Pvt. Ltd. were part of audit study at DIT University.

1. Dr. P.P.Mittal –Principal Auditor
2. Mr. Satvinder Singh-Associate Auditor
3. Mr. Ranjit Singh -Data surveyor cum senior instrument technician
4. Mr. Ashwani-Instrument technician

## Executive Summary

Water is a precious and scarce resource on planet and especially the scarcity of water in India is predominant because of its requirement of water for direct consumption and also higher consumption of resources that also further require water for all processes. Water is required for electrical generation as well as Air conditioning also. Water is a main aspect of Environment. Water audit is a snapshot in time, in which one assesses campus performance in complying with applicable water use benchmarks, maintaining required quality of drinking water, optimising water use thereby mitigating impact of its activities on the climate change. Though a helpful benchmark, the water audit almost immediately becomes outdated unless there is some mechanism in place to continue the effort of monitoring water use for the activities of university. This audit report contains observations and recommendations for improvement of consciousness towards water use reduction, water wastage avoidance and recycle and reuse of water.

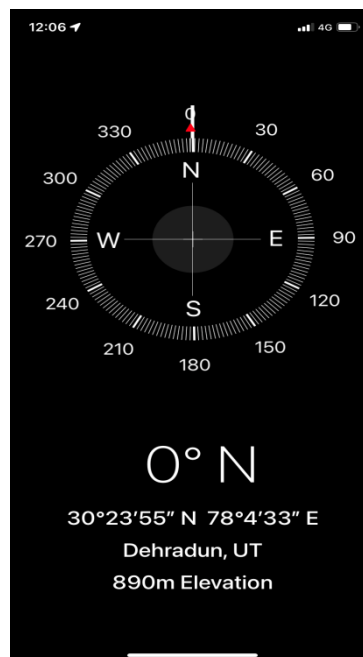
A nation's growth starts from its educational institutions, where the ecology of which water is the main constituent along with waste and air is thought as a prime factor of development associated with environment. Educational institutions now a day are becoming more sensitive to environmental factors and more concepts are being introduced to make them eco-friendly. Awareness and sensitization of students on water use and water conservation will go a long way for the benefit of planet.

With pro-active approach of management and staff for improvement of environment and reduction of impact of university activities including water use on climate, there is always an inclination of all related stake holders that is teaching, non-teaching staff and other support staff the university is continually functioning for conservation of water in university and sensitization around university premises and mitigation of impact of its activities on climate by optimization of water use.

To conserve the water within the campus, various viewpoints are applied by all the concerned stake holders. DIT university-Dehradun to solve their environmental problems through inclusion of water during formulation of Environment and green policy.

## Brief about DIT University

The DIT University is located at village, Makkawala, Mussorie Diversion Road, Dehradun. The coordinates of DIT University are latitude 30 degrees 23' And 55 "North Longitude 78 degree 4' 33" East at an altitude of 280 meters above mean sea level. It is located at 890 meters altitude above sea level.



As per NBC-2016 and ECBC-2017, climate of Dehradun is in composite which means that climate of Dehradun has high number of heating degree days and also higher number of cooling degree days, thus impacting its water use during summer.

The university campus has the following facilities

### Schools

- School of Computing
- School of Architecture, Planning & Design
- School of Pharmaceutical & Populations Health Informatics
- School of Physical Sciences
- School of Liberal Arts & Management
- Department of Management Studies
- Department of Humanities & Liberal Arts

- School of Engineering & Technology
- Department of Civil Engineering
- Department of Electrical and Electronics & Communication Engineering
- Department of Mechanical Engineering
- Department of Petroleum & Energy Studies

### Central Facilities and Labs in University Premises

- Veda - The Central Library
- Computing Facilities
- NPTEL
- Central Workshop

### LABS

- Architecture
- Civil Engineering
- Mechanical Engineering
- Petroleum & Energy Studies
- Pharmacy
- Humanities
- Physical Sciences
- Electrical and Electronics & Communication Engineering



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## Methodology

### **Pre -Audit meeting**

A pre-audit meeting provided an opportunity to reinforce the scope and objectives of the audit and discussions were held on the practicalities associated with the audit. This meeting is an important prerequisite for the water audit because it is the first opportunity to meet the University concerned personnel for audit and deal with any concerns.

### **Management's Commitment**

The Management of the university has shown the commitment towards the green auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly such as awareness programs on the water conservation etc., after the green and water auditing.

### **Scope and Goals of Water Audit**

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues of which water use is the main constituent. Water Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care which is the responsibility of each individual who are the part of Economical, financial, social, environmental factor. It is necessary to conduct water audit in university campus because students become aware of the importance of water use and its management, its advantages to save the planet and they become responsible citizen of our country who will care for limited and scarce natural resources..

## Points of Appreciation

1. The staff of DIT university are quite aware and proactive in approach towards water a major environmental aspects.
2. There is initiation in maintenance of data for water use.
3. There are two operational STP, s are installed and used for re-use of water and avoiding discharging black water directly into natural streams.
4. Reuse of water: The treated water from STP is used for Gardening and Flushing purpose depending on the quantity treated.
5. There is an environment policy in place that covers aspects of Water use also.
6. There are push type taps installed for reducing the water use and reduction of wastage.
7. Most of the places ablution taps are not installed and health faucet have been installed for avoiding the wastage of water.
8. The staff and students of university are taking active interest for improvement of environment through water management.
9. The university is regularly conducting department activities for creating awareness and sensitization of students, faculty members and other staff members. Few of these are in next chapter



# Activities of University on water use

## World Water day Celebration



REPORT  
EVENT: WORLD WATER DAY  
11-UK (3)Bn. NCC DITU

DATE: 22<sup>nd</sup> March 2022

TIME: 4 pm

VENUE: Chanakya seminar hall DIT University

NCC Cadets of DIT university conducted a event of world water day . It was an offline event and the Cadets participated in this event with full enthusiasm.

This event on world water day was organized to make people aware about the importance of ground water and how we can conserve the water. This event was conducted on 22nd of march 2022 from 4pm to 5pm at Chanakya seminar hall DIT University

It was an offline event. The cadets presented the Slogans , Speeches , poems and there personal views on how they can contribute in saving water. Vaishnavi Thapa and Bhavya Puri were the hosts of the event. She introduced us to the importance of the topic and why we celebrate it

The ANO Brijlata Chauhan shared her views about the importance of world water day and encouraged us to give our selfless contribution in saving water and thereby saving mother earth. She also motivated us for tree plantation

The world water day is celebrated since 1993 to mark the importance of groundwater in everyone's life .lastly the event ended with NCC song and with a great message





#### 6. Event - World Water Day

Date: 22<sup>nd</sup> March 2021

Time: 3:30 pm

Venue: Online (google meet)

NCC Cadets of DIT university conducted a webinar on world water day it was an online event and the Cadets participated in this event with full enthusiasm.

With 'valuing water' as this years theme the webinar on world water day was organized to make people aware about the importance of water. This event was conducted on 22<sup>nd</sup> of March 2021 from 3:30pm to 4:30pm

It was an online event The cadets participated in different activities. Pallavi Mahra and Ishita Gupta were the hosts of the event. Shikhi Kaur and Aayushi Kaur prepared a speech. Kirti Verma, Ishita Gupta and Pallavi Mahra made some posters and a power point presentation.

The ANO Bhijlata Chaudhan shared her views about the importance of water along with some of the measures to save water and made everyone realize that world water day is an opportunity to learn more about water related issues, be inspired to tell others and take action to make a difference.

It is well said – "if you save water,

Water will save you".

World water day is meant to be a call to action. We must recognize the importance of water and take action to conserve this basic resource, the resource which gives our planet its unique colour.



11 UN Girls Bn NCC DIT University, Dehradun, UK India

## General Observations and Recommendations

- ❖ The Environment and Green policy be displayed at following prominent locations inside the premises.
  - a. Near main gate
  - b. At main entrance of Administrative Building
  - c. Cafeteria
  - d. Academic Blocks
  - e. Auditorium
  - f. Library
  - g. Hostels
- ❖ Signage for water conservation are required to be displayed in Cafeteria and also in hostels and all other toilets .These are also required to be displayed at main entrance and other prominent areas inside the campus..
- ❖ Single stack plumbing system is in place in all buildings except two buildings thereby increasing the avoidable load on STP and also increasing the electricity consumption for treatment of mixed water.
- ❖ Two stack plumbing system is recommended for future augmentation/major repairs for separation of Black and grey water for energy savings and not stressing the capacity of installed STP.
- ❖ Flow Meters be installed at the three incoming water lines immediately for measuring the water use.
- ❖ Flow Meters are also required to be installed at the following locations
  - a. Cafeteria
  - b. All hostels
  - c. All other buildings
  - d. Water used for horticulture

# Environment and Green Policy with Water Use as Constituent

## DIT UNIVERSITY, DEHRADUN ENVIRONMENTAL & GREEN POLICY

### Policy Statement

DIT University, Dehradun, is dedicated to its estate management in accordance with the responsibilities to pressure out environment. These responsibilities shall be established within the following areas as under:

1. **Environmental Rules and Guidelines:** DIT University commit to safeguard the compliance to extant pollution control and other appropriate environmental guidelines. Tree Plantation Policy is in place to ensure that adequate green cover is maintained in and around the campus.
2. **Waste Disposal and Recycling:** DIT University will pursue to minimize its generation of waste without compromising its primary functions, or by re-use of materials within or outside the university premises. The materials shall be recycled wherever the reduction or re-use is not feasible. The Waste Management prices shall be strictly of the University adhered to.
3. **Energy:** DIT University is ecologically accountable for its use of energy, and will therefore consider the sources, type, origin and destination of energy input and output throughout the premises. This will require careful nursing of alternate energy sources, removal of unnecessary or redundant used system, and a continuing program of energy preservation. There are already renewable energy solar PV plants installed and in the near future, efforts shall be made to use renewable energy to the degree possible for mitigation of impact of energy used by university on the environment.
4. **New Build and Building Refurbishment:** DIT University, Dehradun, will ensure that any new construction or refurbishment whenever planned shall be executed as per the guidelines prescribed by the National Building Code-2016 and the prescribed EIA guidelines.



*Handwritten signature*

5. **Water Use:** The University intends to promote optimization of water use by avoidance of wastage, treatment, recycling and re-use of waste water for other possible uses.
6. **Cleaning:** DIT University shall use such cleaning products that are suitable and prescribed by the concerned approving bodies and which prescribe to reducing the carbon foot print followed by cost and suitability. The University shall monitor and assess its working practices aligned towards controlling the doses so as to reduce the risk of over concentration and additional residue of unused cleaning mixtures which may find their way into piped waste disposal systems.
7. **Green Travel Plan:** DIT University, Dehradun actively encourages the use of public transport, walking and cycling. The University, wherever possible encourages students and staff to use public transport when on college assignments. This plan is regularly reviewed. The travel of students shall also be encouraged through public or shared transport.
8. **Tobacco Free premises:** The University administration pledges and carries out various initiatives to make the premises tobacco free completely. No smoking nor any type of tobacco products shall be allowed inside the campus.
9. **Food Policy:** DIT University, will ensure that decisions pertaining to the purchase of food, together with the use and disposal of plastic crockery/cutlery, should at all times include assessing the environmental implications as well as such factors as cost and nutritional value. The notification By UGC for use of junk food in the premises shall be strictly followed.
10. **Purchasing:** For the purchase of various items including services, materials, equipment and different types of consumable items, DIT University, Dehradun wherever possible, would undertake services where the probability of environmental harm is the least.
11. The university also commits for Plastic free environment in premises.

**The policy shall be swotted annually or as per requirement and shall be communicated to all stake-holders.**



A handwritten signature in blue ink, appearing to be "Anand", is written next to the university logo.

## Water Use in University & Sources of Water

### Water Uses

1. **Human** - Drinking water – Toilets - Bathrooms
2. **Fire-Fighting**
3. **Horticulture** - Trees and Green Area
4. **Mess and Cafeteria**
5. **Labs**

### Sources of Incoming Water

- a. Borewell - 2 Nos.
- b. Supply from public source - 2 Nos.
- c. Water treated by STP

## Details of Occupancy

### DIT UNIVERSITY-OCCUPANCY DATA

Sr. No	Description	Qty-Nos	No of Days of Occupancy
1	No of Day Time Students	3501	243
2	Student in Hostel	1356	351
3	Faculty and Staff	218	231
4	Non-Teaching Staff (Damion)	245	297
5	Support Staff/ Security	54	310
6	Outsourced ( Vendor) Staff	182	310
7	Approx. No. of daily visitors	25	310

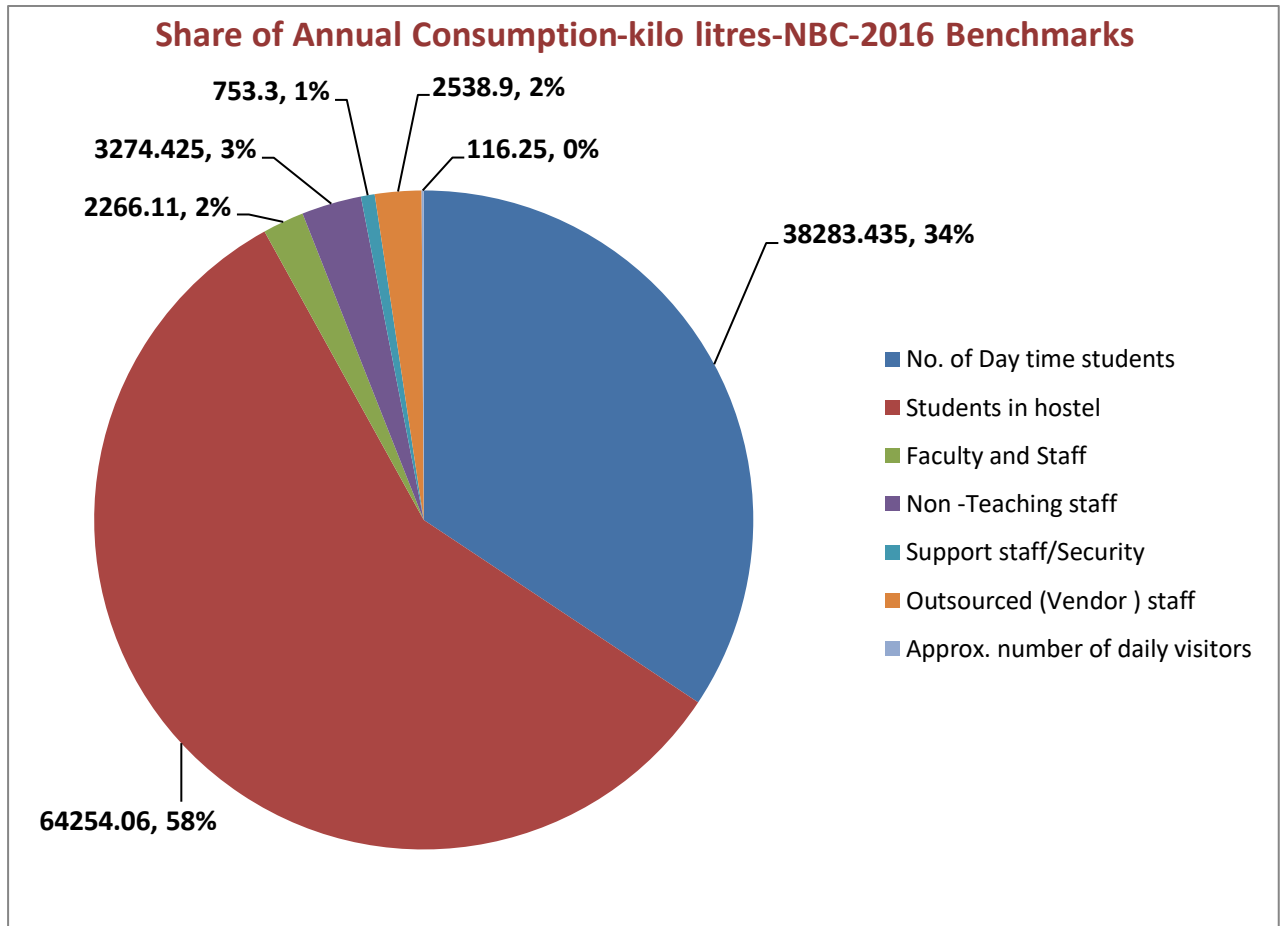


## Annual Water consumption benchmark as per NBC-2016

Sr. No.	Description	Quantity Nos.	No. of Days of Occupancy	Consumption per capita per day as per NBC-2016	Annual Consumption-kilo litres
1	No. of Day time students	3501	243	45	38283.435
2	Students in hostel	1356	351	135	64254.06
3	Faculty and Staff	218	231	45	2266.11
4	Non -Teaching staff	245	297	45	3274.425
5	Support staff/Security	54	310	45	753.3
6	Outsourced (Vendor ) staff	182	310	45	2538.9
7	Approx. number of daily visitors	25	310	15	116.25
<b>Total consumption of Occupants as per NBC-2016 bench mark</b>					<b>111486.48</b>



## Share of Annual consumption-NBC-2016



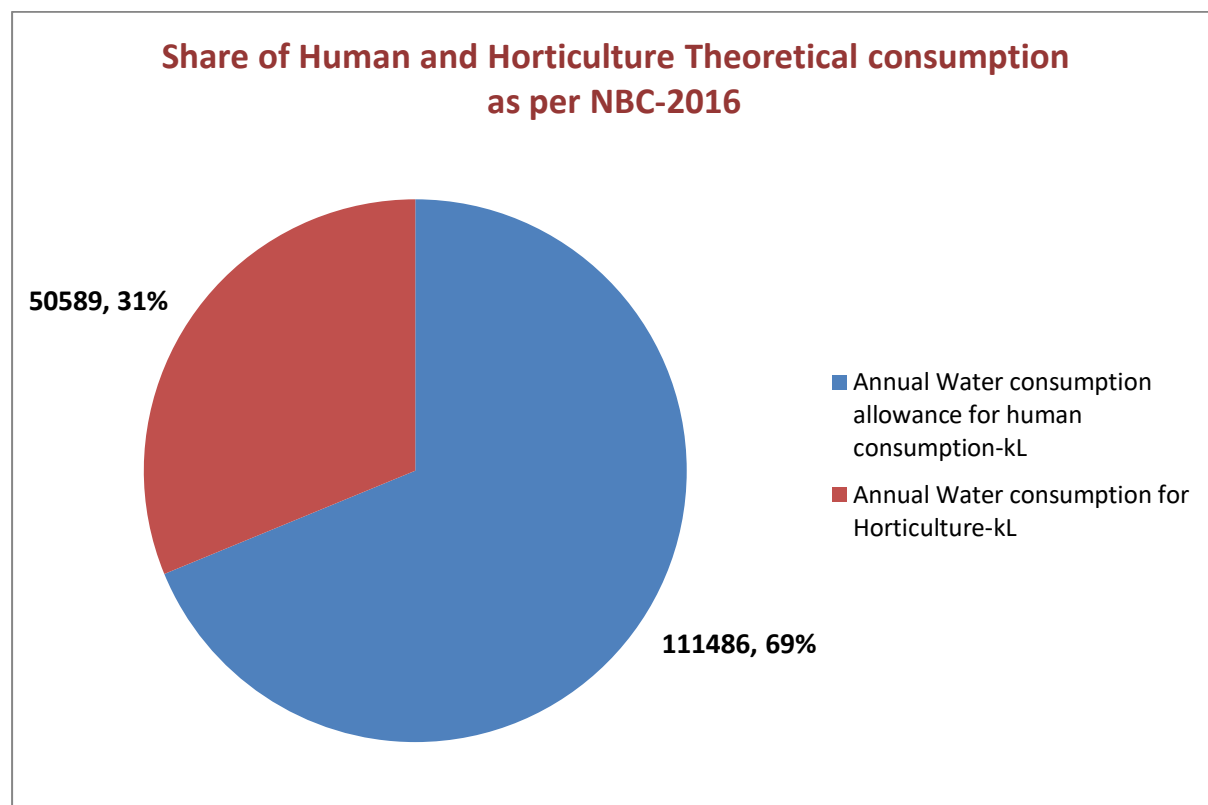
From above Pie Chart it is observed that 58 % of total annual water consumption-Theoretical allowance is for students in hostel and 34 % of benchmark consumption is by Day time students. Only 8 % is used by faculty and staff, Non-teaching staff, support staff /Security, outsourced (vendor) staff and daily visitors.

The main focus of water conservation should be laid on hostels and water use by day time students. Special attention should be given to toilets used by students in hostels and toilet used by day time students

## Share of Water Consumption as per NBC-2016-Norms

From the above graph it is evident that present actual consumption of water is lower than theoretical bench mark of water use as per NBC-2016.

<b>Annual water consumption theoretical allowance as per NBC-2016</b>	
<b>Annual Water consumption allowance for human consumption-kL</b>	<b>111486</b>
<b>Annual Water consumption for Horticulture-kL</b>	<b>50589</b>
<b>Total annual Consumption (Allowance as per NBC-2016)</b>	<b>162075</b>



From above Pie chart it is evident more than 31 % water allowance is for Landscape purpose and balance 69 % for human consumption

## Estimated Annual Consumption

### Estimated annual consumption

Sr. No.	Description	Percentage water consumption	Total Consumption for 179 days- Estimated-kl	No. of days of water use	Estimated annual consumption-kL
1	Students in Hostel	58	42230	351	48029
2	Day time students	34		243	19492
3	Faculty and staff	2		231	1090
4	Non-teaching staff	3		297	2102
5	Outsourced vendor staff	2		310	1463
6	Support staff/security	1		310	731
	<b>Total Annual estimated use of Water-Human consumption</b>				<b>72907</b>
	<b>Estimated annual consumption for Horticulture</b>				<b>50589</b>
	<b>Total Annual estimated use of Water-Human consumption +Horticulture</b>				<b>123496</b>

### Comparison of actual and theoretical annual water consumption

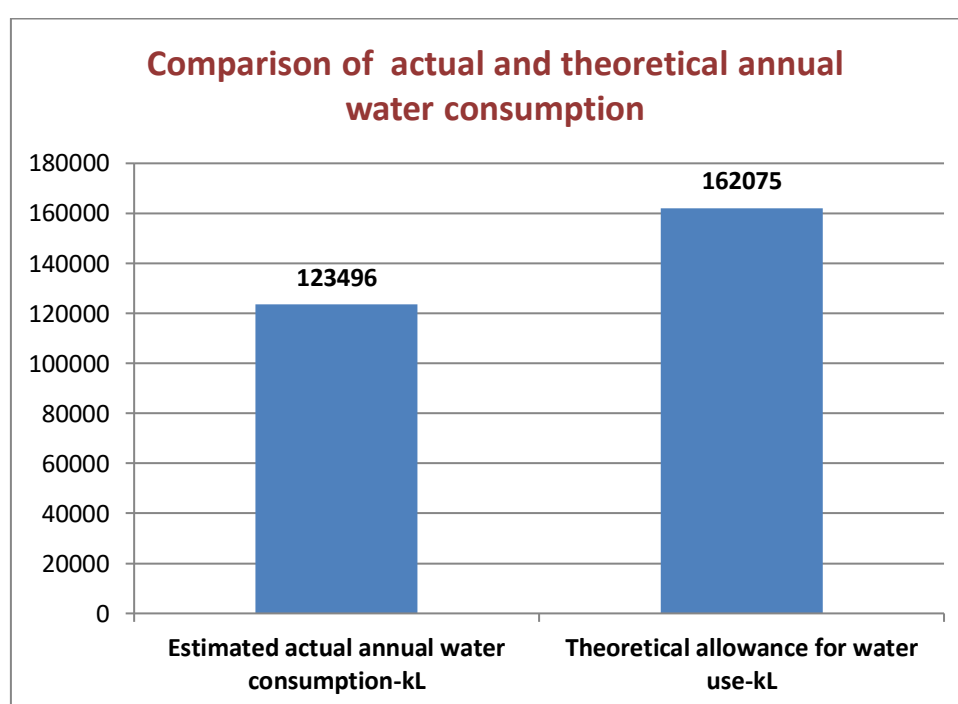
<b>Estimated actual annual water consumption-kL</b>	<b>123496</b>
<b>Theoretical allowance for water use-kL</b>	<b>162075</b>

## Total Turf Area

**Total Turf Area = 1.98 Hectares = 19800 Sq. mts.**

### Water Consumption - Green Area

S.No.	Total area-sq.mts.	Allowance lts/day/sq.mts.	Total daily allowance-kL	Annual Allowance-kL
1	19800	7	138.6	50589



### Water requirement as per NBC-2016 is attached in Annexure-C

There is ample awareness of management of university campus towards sustainability. Management of university is very instrumental in spearheading movement of sustainable practices in running of university and also facilitating dissemination of these practices to all students studying in this campus. It is through support of management and active involvement of other stake holders and staff members that this university has managed sustainable practices by being proactively initiating suitable actions for the same.

In all matters of resource use, there is effective implementation of 3R's. **Reduction** of resource use, **Re-cycling** of resources and also **Re-use**. It is for attaining objectives of sustainability.


## STP & Water Test Reports

**STP is installed in campus and is used for re-use of treated water.**

During audit, it has been seen that a lot of work for conservation of water has already been taken. The quality of water is also periodically tested and the result of testing are given here under for reference

### Water Test Reports

**Water quality is regularly monitored. Water test reports are attached here with.**



**ITL LABS PVT. LTD.**<sup>TM</sup>  
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 Ph.:+91-11-27915654, 27915608, Cust. Care No. 9891317619  
 E-mail : itllabs@gmail.com  
 Approval No. : NW9(14)/LAB

**TEST REPORT**


Report No.	: C202107070045	Date of Reporting	: 29/10/2021
Issued to	Mentor Water Experts Pvt. Ltd., Delhi-09	Date of Sampling	: 23/10/2021
		Test Started on	: 25/10/2021
		Issue of test report	: 29/10/2021
Location of sample	: DIT University	Batch No.	: None
Nature of Samples	: Drinking Water	Sample Qty.	: 2 liters

**Table 1 Organoleptic and Physical Parameters**

S. No.	Parameters	Results	Complete test as per IS:10500-2012		Detection Limit	Test Method
			Acceptable Limit	Permissible Limit		
i	Colour, Hazen units	<1.0	5 Max	15 Max	1.0	IS:3025 (Pt-4)-1983
ii	Odour	Agreeable	Agreeable	Agreeable	-	IS:3025 (Pt-5)-1983
iii	Taste	Agreeable	Agreeable	Agreeable	-	IS:3025 (Pt-7&8)-1984
iv	pH Value	7.26	6.5 to 8.5	No relaxation	0.01	IS:3025 (Pt-11)-1983
v	Turbidity, NTU	<1.0	1 Max	5 Max	1.0	IS:3025 (Pt-10)-1984
vi	Total Dissolved solids, mg/l	26	500 Max	2000 Max	1.0	IS:3025 (Pt-16)-1984

**Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts**

vii	Calcium (as Ca), mg/l	8.60	75 Max	200 Max	0.2	IS:3025 (Pt-40)-1991
viii	Chloride (as Cl), mg/l	6.23	250 Max	1000 Max	0.2	IS:3025 (Pt-32)-1988
ix	Fluoride (as F), mg/l	BDL	1 Max	1.5 Max	0.1	IS:3025 (Pt-60)-2008
x	Free residual chlorine, mg/l	BDL	0.2 Min	1 Min	0.02	IS:3025 (Pt-26)-1986
xi	Iron (as Fe), mg/l	BDL	1.0 Max	No relaxation	0.05	IS:3025 (Pt-53)-2003
xii	Magnesium (as Mg), mg/l	6.20	30 Max	100 Max	0.2	IS:3025 (Pt-46)-1994
xiii	Nitrate (as NO <sub>3</sub> ), mg/l	BDL	45 Max	100 Max	0.1	IS:3025 (Pt-34)-1988
xiv	Sulphate (as SO <sub>4</sub> ), mg/l	8.2	200 Max	400 Max	1.0	IS:3025 (Pt-24)-1986
xv	Total Alkalinity (as CaCO <sub>3</sub> ), mg/l	3.54	200 Max	600 Max	0.5	IS:3025 (Pt-23)-1986
xvi	Total Hardness (as CaCO <sub>3</sub> ), mg/l	6.32	200 Max	600 Max	0.5	IS:3025 (Pt-21)-2009
xvii	Total Arsenic (as As), mg/l	BDL	0.01 Max	No relaxation	0.01	IS:3025 (Pt-37)-1988
xviii	Electrical Conductivity, μs/cm	64.3	-	-	1.0	IS:3025 (Part-14)-1985
xix	Total Coliform/100ml	Absent	Should be absent	Should be absent	1.0	IS:1622:1981
xx	Escherichia coli/100ml	Absent	Should be absent	Should be absent	-	IS:1622:1981
xxi	Fecal coliform/100ml	Absent	-	-	-	IS:1622:1981



(Authorised Signatory)



# ITL LABS PVT. LTD.<sup>TM</sup>

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Ph.:+91-11-27915654, 27915608, Cust. Care No. 9891317619

E-mail : itllabs@gmail.com

Approval No. : NWS(14)/LAB

## TEST REPORT

Report No.	: C202107070045	Date of Reporting	: 29/10/2021
Issued to	: Mentor Water Experts Pvt. Ltd. Dehradun	Date of Sampling	: 23/10/2021
		Test Started on	: 26/10/2021
		Issue of test report	: 29/10/2021
Location of sample	: DIT University	Batch No.	: None
Nature of Samples	: Drinking Water	Sample Qty.	: 2 liters

Table 1 Organoleptic and Physical Parameters

S. No.	Parameters	Results	Complete test as per IS:10500-2012		Detection Limit	Test Method
			Acceptable Limit	Permissible Limit		
i	Colour, Hazen units	<1.0	5 Max	15 Max	1.0	IS:3025 (Pt-4)-1983
ii	Odour	Agreeable	Agreeable	Agreeable	-	IS:3025 (Pt-5)-1983
iii	Taste	Agreeable	Agreeable	Agreeable	-	IS:3025 (Pt-7&8)-1984
iv	pH Value	7.32	6.5 to 8.5	No relaxation	0.01	IS:3025 (Pt-11)-1983
v	Turbidity, NTU	<1.0	1 Max	5 Max	1.0	IS:3025 (Pt-10)-1984
vi	Total Dissolved solids, mg/l	32	500 Max	2000 Max	1.0	IS:3025 (Pt-16)-1984

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts

vii	Calcium (as Ca), mg/l	3.62	75 Max	200 Max	0.2	IS:3025 (Pt-40)-1991
viii	Chloride (as Cl), mg/l	8.40	250 Max	1000 Max	0.2	IS:3025 (Pt-32)-1988
ix	Fluoride (as F), mg/l	BDL	1 Max	1.5 Max	0.1	IS:3025 (Pt-60)-2008
x	Free residual chlorine, mg/l	BDL	0.2 Min	1 Min	0.02	IS:3025 (Pt-26)-1986
xi	Iron (as Fe), mg/l	BDL	1.0 Max	No relaxation	0.05	IS:3025 (Pt-53)-2003
xii	Magnesium (as Mg), mg/l	8.91	30 Max	100 Max	0.2	IS:3025 (Pt-46)-1994
xiii	Nitrate (as NO <sub>3</sub> ), mg/l	BDL	45 Max	100 Max	0.1	IS:3025 (Pt-34)-1988
xiv	Sulphate (as SO <sub>4</sub> ), mg/l	7.8	200 Max	400 Max	1.0	IS:3025 (Pt-24)-1986
xv	Total Alkalinity (as CaCO <sub>3</sub> ), mg/l	6.25	200 Max	600 Max	0.5	IS:3025 (Pt-23)-1986
xvi	Total Hardness (as CaCO <sub>3</sub> ), mg/l	5.34	200 Max	600 Max	0.5	IS:3025 (Pt-21)-2009
xvii	Total Arsenic (as As), mg/l	BDL	0.01 Max	No relaxation	0.01	IS:3025 (Pt-37)-1988
xviii	Electrical Conductivity, $\mu$ s/cm	72.51	-	-	1.0	IS:3025 (Part-14)-1985
xix	Total Coliform/100ml	Absent	Should be absent	Should be absent	1.0	IS:1622:1981
xx	Escherichia coli/100ml	Absent	Should be absent	Should be absent	-	IS:1622:1981
xxi	Fecal coliform/100ml	Absent	-	-	-	IS:1622:1981

(Authorised Signatory)

## Program on Water use

### Regular Program on Water use are conducted



#### Report

Event: Ganga Utsav [38 cadets]

11-UK(G)Bn. NCC DITU

Date: 2<sup>nd</sup> Nov. 2021

Time: 9:30 pm stre

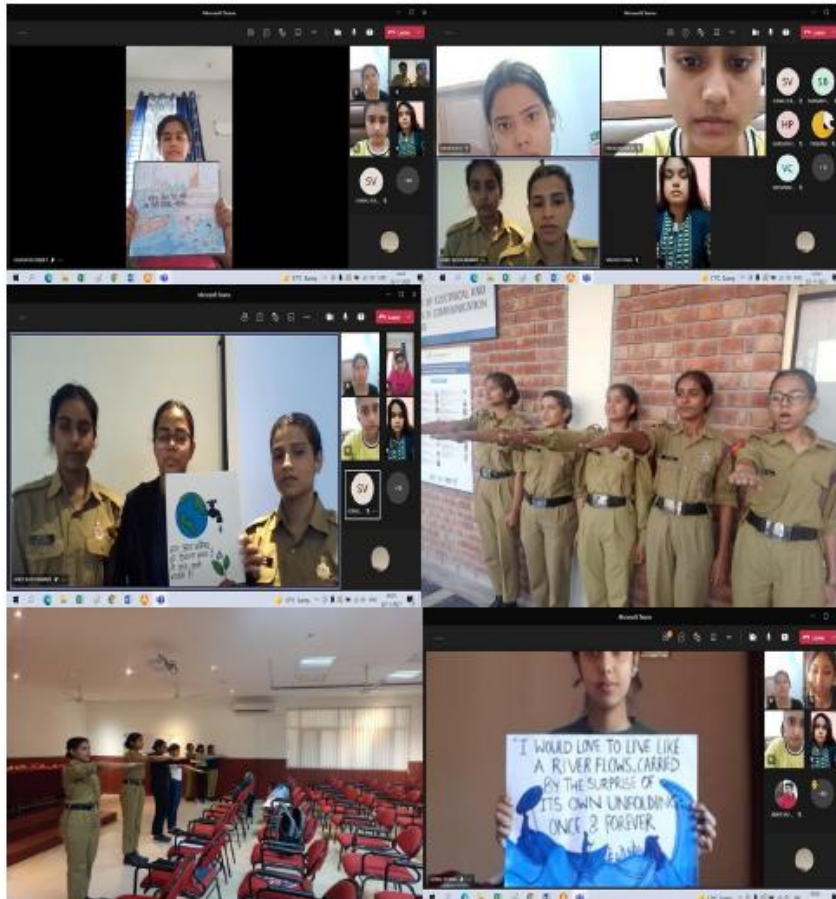
NCC Cadets of DIT university conducted a webinar on Ganga Utsav. It was an online event and the Cadets participated in this event with full enthusiasm.

This webinar on Ganga Utsav was organized to make people aware about the importance of strengthening of the public – river connect. This event was conducted on 2<sup>nd</sup> of November 2021 from 9:30am to 10:30am. It was an online event. The cadets prepared there slogans. Ishita Gusain were the hosts of the event. ANO Lt. (Dr.)Brajlata Chauhan started with quote

**“Ganga ko nirmal rahne do  
Ganga ko aviral bahne do”**

And shared her views about the importance of Ganga and encouraged us to revive the deep cultural connect with Maa Ganga, for sustainable healthy present and future generations . As a part of the celebration first year cadets prepared their slogans in form of poster with great enthusiasm and dedication . Cdt Aditi Chauhan shared her views in form of speech.





Dr.Naveen Singhal motivated all of us as the Ganga is the foremost of India's seven sacred rivers, winding fifteen hundred miles from the glaciers of Himalayas through twenty nine cities and seventy towns of the northern Indian plains as it plays a big role in our past, present and future.

At the end of the program Cdt Ankit Kumawat and Cdt Aditi Chauhan took the pledge

The Ganga is considered a lifeline of India because it provides water to 40% of India's population. Additionally, it is a source of irrigation for a wide variety of crops.

"Gita and Ganga constitute, between themselves, the essence of Hinduism: one its theory, and the other is practice."



## Water Use Study - Flow Rate

### Flow Rate of Installed Fixtures Measured - Flow-Litres per Minute

Sno	Location	Wash Basin		
1	Vastu Block - Gents Toilet	5.69	-	-
2	Vastu Block - Ladies Toilet	20.00	14.08	-
3	Vastu Block - Gents Toilet	-	-	-
4	Pharmacy - Gents Toilet	24.49	19.48	
5	Pharmacy - Ladies Toilet	4.29	5.34	3.80
6	Sarojini Girls Hostel Mess	8.67	43.17	2.31
7	Kasturba Girls Hostel - Triple share Room	-	-	-
8	Kasturba Girls Hostel - Single Share Room	-	-	-
9	Sarojani Girls Hostel - Triple share Room	16.85	-	-
10	Sarojani Girls Hostel - Triple Bed 3 Room Apartment	5.83	-	-
11	Sarojani Girls Hostel - Twin share Twin Bed Room	14.29	-	-
12	Boys Hostel - Bhabha Block	2.31	-	-
13	Boys Hostel - Sarabhai Block	16.71	30.00	-
14	Boys Hostel - Mess	6.85	6.83	3.15

### Flow Rate Measurement -Flow-Liters per Minute

Sno	Location	Wash Basin		Tap
1	Kasturba Girls Hostel - Triple share Room	9.38	-	-
2	Kasturba Girls Hostel - Single Share Room	11.76	-	-
3	Sarojani Girls Hostel - Triple share Room	9.92	-	-
4	Sarojani Girls Hostel - Triple Bed 3 Room Apartment	7.21	-	-
5	Sarojani Girls Hostel - Twin share Twin Bed Room	17.65	-	19.54
6	Boys Hostel - Raman Block	21.74	5.52	-
7	Boys Hostel - Bose Block	27.52	24.69	-
8	Boys Hostel - Bhabha Block	32.79	-	-
9	Boys Hostel - Sarabhai Block	22.22	-	-
10	Boys Hostel - Mess	-	-	-

**Flow Rate Measurement -Flow-Liters per Minute**

<b>Sno</b>	<b>Location</b>	<b>Sink</b>			
1	Pharmacy Chemistry Lab - II	<b>12.20</b>	<b>7.80</b>	<b>11.01</b>	<b>5.24</b>
2	Chemistry Lab	<b>3.85</b>	<b>4.01</b>	<b>4.32</b>	<b>3.88</b>

**Flow of fixtures is noticed to be higher. These are required to be replaced with efficient low flow plumbing fixtures specially for Hostel room toilets. At common places this can be presently managed with installed valves. Flow restrictors can also be considered for reduction of water flow.**

## Inventory of Toilet

Sr. no	Location	URINAL	WC	WASH BASIN	Sink	Bath Area Tap	Tap	Sets
1	Chanakya Admin Block - Gents Toilet	6	2	2				3
2	Chanakya Admin Block - Ladies Toilet		4	2				
3	Chanakya Admin Block - Handicap Toilet		1	1				
4	Vastu Block - Gents Toilet	2	1	1				4
5	Vastu Block - Ladies Toilet		2	2				
6	Vastu Block - Gents Toilet	3	4	3				
7	Vastu Block - Ladies Toilet		3	2				
8	Pharmacy - Gents Toilet	2	1	2				3
9	Pharmacy - Ladies Toilet		2	3				
10	Pharmacy Chemistry Lab - II				32			
11	Vedanta Block G. Floor - Gents Toilet	7	2	3				
12	Vedanta Block G. Floor - Ladies Toilet		5	3				
13	Vedanta Block 1st Floor to 4th floor - Gents Toilet	13	4	5				4
14	Vedanta Block 1st Floor to 4th floor - Ladies Toilet		10	10				
15	Vedanta Block 5th Floor - Gents Toilet	12	3	4				
16	Vedanta Block 5th Floor - Ladies Toilet		7	4				
17	Sarojani Girls Hostel - Security Office		1	2			1	
18	Sarojani Girls Hostel Mess		6					
19	Kasturba Girls Hostel - Triple share Room		2	1		1		32
20	Kasturba Girls Hostel - Single Share Room		1	1		1		23
21	Sarojani Girls Hostel - Triple share Room		2	1		1		45
22	Sarojani Girls Hostel - Single Share Room		1	1		1		

23	Sarojani Girls Hostel - Triple Bed 3 Room Apartment		1	1		1		
24	Sarojani Girls Hostel - Twin share Room		1	1		1		
25	Sarojani Girls Hostel - Visitors		1	1			1	
26	Vivekanand Block - Gents Toilet	2	1	2				
27	Vivekanand Block - Ladies Toilet		2	2				
28	Vivekanand Block - Gents Toilet Staff	1	1	1				
29	Vivekanand Block - Ladies Toilet Staff		1	1				
30	Vivekanand Block - Gents Toilet	10	7	6				5
31	Vivekanand Block - Ladies Toilet		8	9				
32	Chemistry Lab				16			
33	Workshop - Gents Toilet	6	3	4				4
34	Workshop - Ladies Toilet		4	3				
35	Workshop - Staffs Toilet		1	3				
36	Civil and Petroleum Block - Gents Toilet	5	4	2				6
37	Civil and Petroleum Block - Ladies Toilet		4	4				
38	Medical Room		1	1				
39	Boys Hostel - Raman Block	3	3	3		3		36
40	Boys Hostel - Bose Block	3	3	3		3		28
41	Boys Hostel - Bhabha Block		1	1		1		72
42	Boys Hostel - Sarabhai Block	1	1	2		1		108
43	Boys Hostel - Mess			5				

## Observations on Water Use

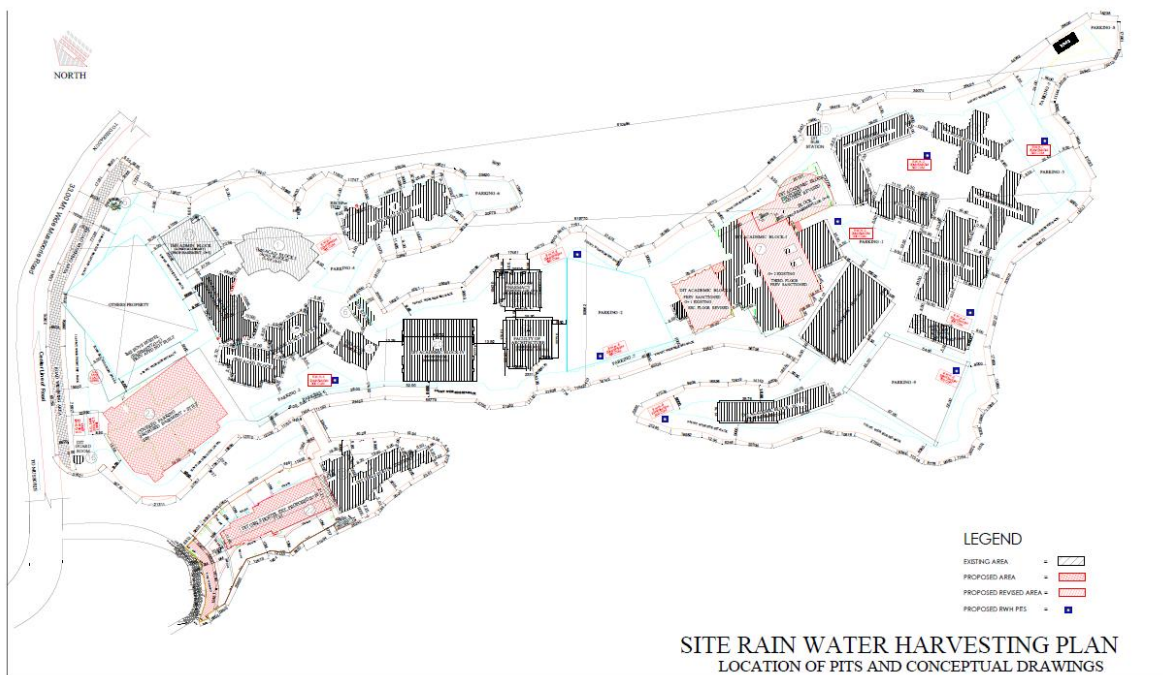
The following points needs attention and required to be addressed. The saving targets over NBC-2016 requirement should be fixed for next 12 months and practice of recording and reviewing of water use on periodic basis for pointing out any sudden variation is required to be followed

Sr. No.	Issue	Standard	Shortcomings	Recommendations
1	Flow of water in plumbing fixtures	GRIHA /IGBC	Flow is measured is high	High plumbing fixtures are replaced with low flow fixtures whenever these are replaced after wear and tear. Till the time the flow should be regulated from valves where ever existing for wash Basin and Sinks. Flow restrictors be also considered.
2	Cisterns installed for flushing	GRIHA /IGBC	Double flow cisterns are installed	Awareness is required to be created for use of Dual flow fixtures for water conservation.
3	Rain Water harvesting system	Central Water Ground Water Board	20 Nos. Rain Water harvesting pits are installed	These are maintained and functioning effectively.
4	Water Meters	NBC-2016	Water Meters for extraction source are installed	Water Meters be got installed for Individual blocks, Labs and also for water used for horticulture/landscaping purpose.
5	Bills and Stickers for water conservation	Best practices	Presently installed at few locations only	The stickers be installed near water use points for conservation of water. Especially in Hostel Toilets, these are required to be put.

## Rain Water Harvesting System

Presently there are no Rain Water harvesting system pits have been installed.

There is planning and action initiated is at a very advance stage for executing work of construction of Rain water harvesting pits.



The regular cleaning and de-silting process are carried out for maintenance of Rain water harvesting pits.

## Sustainable Development Goals

Sustainable development should always be practiced in all activities of university. The university administration, students and staff are already aware and efforts are always put to meet requirement as per applicability.

# SUSTAINABLE DEVELOPMENT GOALS



The principal, teaching and Non-teaching staff is aware of these goals and there is a practice of considering these goals while taking decisions in university.

Clear Water and Sanitation is one of Sustainable development goals of United Nations

## Summarization of Water Audit Findings

A Water Audit was conducted; the major relevant aspects that were covered in this audit and present level of performance of University are summarized here:

- 1. Awareness of Staff:** The concerned staff is very much aware about importance of and there are excellent records maintained and kept updated for environmental aspects. This attitude has made the implementation of environmental aspects for activities of university easier and effective.
- 2. Water consumption:**  
The estimated water consumption is below NBC-benchmarks and further reduction targets are required to be set.
- 3. Measurement of Incoming Water:** Water is received in university from three sources. Meters are required to be installed for exact measurement and comparison of consumption month and month and assess significant variance and cause should be found and addressed for keeping a check on monthly basis only.
- 4. Policies, planning and Commitment:** The University has already in placed an Environment and Green policy that covers all concerning aspects including water use.
- 5. University Plumbing and sanitation:** The concerned university staff is maintaining the details of all constructed areas of university building and inventory of plumbing and sanitation systems for effective management.
- 6. Recharging of Ground water:** Presently there is no rain water harvesting pit installed in university campus. Planning is underway and rain water harvesting pits are planned to be installed in very near future.
- 7. Turf area:** The university is has large turf area to the extent of 19800 sq. mts. There is substantial requirement of water for managing grass. The efforts are made to manage turf area.
- 8. Native Plantation and water use:** There are plans to plant only native species of trees for survival on use of lower quantity of water thus reducing water requirement.
- 9. Sewage treatment plant:** Two nos. STP are installed after discarding one old STP. The operation is regularly monitored and all the water thus treated is reused.
- 10. Procurement Procedures:**  
The procurement activities of an institution are very significant for making it sustainable and also in mitigation of water foot print. The purchase committee is required to be sensitized for considering flow rate of fixtures also while making future purchases.
- 11. Signage:** signage for creating awareness for water conservation are required to be put at or near all places water is used. **Major consumption of water by humans is by**



**hostel students and day time students, accordingly area of water use by them is required to be provided with signage.**

**12. Quality of Water**

Water used in university campus is regularly tested as per requirement.

**13. Sustainable development goals**

The university staff and students are aware of sustainability goals and practicing the same in their actions as per applicability. Sanitation and water quality is one of seventeen goals. All stake holders are aware of their responsibility




**14. On-site composting and use of manure:**




Leaves and other botanical waste are treated in composting plant and manure thus formed is used in place of chemical fertilizer and no fertilizer is purchased for plantation.




**15. Water efficient fixtures plumbing and sanitation fixtures:** Water efficient fixtures have been installed like push button type taps, health faucet and twin button type cisterns have been installed. Awareness on use of twin knob cisterns is required to be created through signage.




**16. Leak Test program:** To manage leakage and wastage of water of whatever type a leak survey program is being prepared and periodicity and role matrix is being planned. This will go a long way to stop leakages by proactive action.

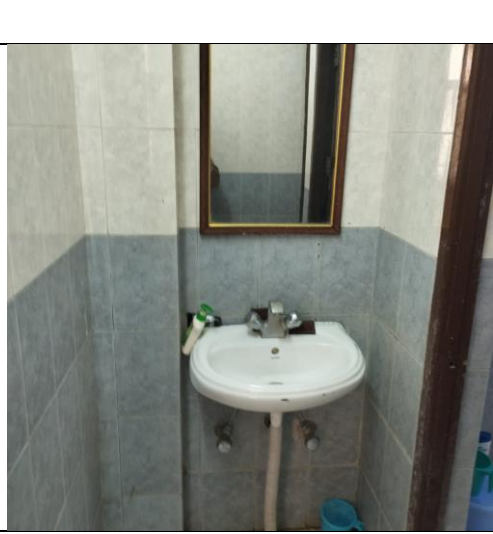
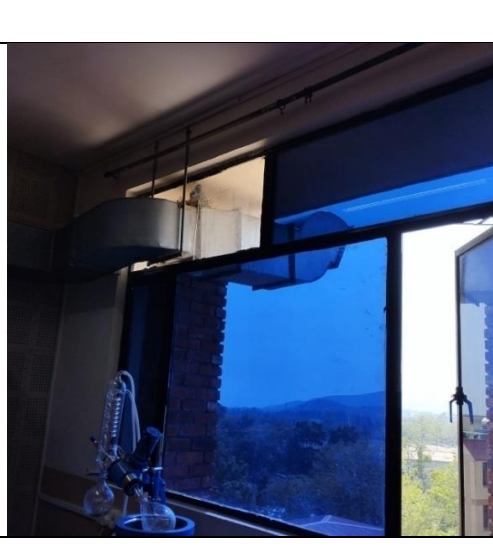
## Annexure-A- Photographs related to use of water


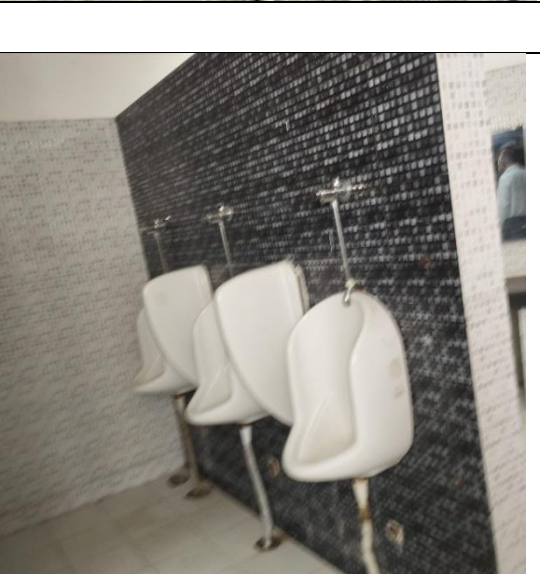
Photographs related to Environment issue related to water use -DIT university- Dehradun		
S. No.	Description	Issue
1		Incoming water pipes –location for installation of Meters on incoming water supply
2		Leakage in water pipe
3		Leakage in external yard hydrant – water leakage survey should be planned with set periodicity

<p>4</p>		<p>STP installed-good practice</p>
<p>5</p>		<p>Good practice-Push and use type taps installed for saving water wastage.</p>
<p>6</p>		<p>Good practice-Push and use type taps installed for saving water wastage.</p>

<p>7</p>	 <p><b>Water Treatment Plant</b></p> <table border="1"> <thead> <tr> <th>Tankage</th> <th>Capacity (Litres)</th> </tr> </thead> <tbody> <tr> <td>UG Incoming Tank</td> <td>200000</td> </tr> <tr> <td>Fire Tank</td> <td>50000</td> </tr> <tr> <td>Raw Water Tank</td> <td>150000</td> </tr> <tr> <td>Water Treatment Plant-1</td> <td>30000 litres/hour</td> </tr> <tr> <td>Water Treatment Plant-2</td> <td>30000 litres/hour</td> </tr> <tr> <td>Treated Water Tank-1</td> <td>150000</td> </tr> <tr> <td>Treated Water Tank-2</td> <td>150000</td> </tr> <tr> <td><b>Total Water Storage</b></td> <td><b>700000 Litres</b></td> </tr> </tbody> </table> <p><b>WATER TREATMENT PLANT</b></p> <p>INDUCED DRINKING SUPPLY WATER RESERVOIR CAPACITY - 200 KL</p> <p>FIRE TANK CAPACITY - 50 KL</p> <p>RAW WATER TANK CAPACITY - 150 KL</p> <p>TREATED WATER TANK - 1 (50 KL)</p> <p>TREATED WATER TANK - 2 (50 KL)</p> <p>TREATED WATER PLANT - 1 (30 KL/H)</p> <p>TREATED WATER PLANT - 2 (30 KL/H)</p>	Tankage	Capacity (Litres)	UG Incoming Tank	200000	Fire Tank	50000	Raw Water Tank	150000	Water Treatment Plant-1	30000 litres/hour	Water Treatment Plant-2	30000 litres/hour	Treated Water Tank-1	150000	Treated Water Tank-2	150000	<b>Total Water Storage</b>	<b>700000 Litres</b>	<p>Water treatment plant</p>
Tankage	Capacity (Litres)																			
UG Incoming Tank	200000																			
Fire Tank	50000																			
Raw Water Tank	150000																			
Water Treatment Plant-1	30000 litres/hour																			
Water Treatment Plant-2	30000 litres/hour																			
Treated Water Tank-1	150000																			
Treated Water Tank-2	150000																			
<b>Total Water Storage</b>	<b>700000 Litres</b>																			
<p>8</p>		<p>Gaps around Pipes-Contamination of water can happen</p>																		
<p>9</p>	 <p><b>Go Green &amp; Help Save the Environment.</b></p>	<p>Good Practice-Green initiative signage</p>																		

10		Audit team working in Field taking measurements
11		Audit team working in Field taking measurements
12		Audit team working in Field taking measurements

13		Health Faucet installed
14		Normal Supply type tap
15		Fume Hood exhaust duct-Discharged in appropriately without raising height

16		<p>Two coloured dust bins lying abandoned. At all the places single Stainless steel dust bin is installed</p>
17		<p>Push type flushing knobs are provided for water conservation –Good practice</p>

# Annexure-B-Sample recording of STP operational parameters

**Mentor Water Experts Pvt. Ltd. Sewage Treatment Plant 500 KLD Logbook**

Site:- **DIT University**

Date: **15/09/20**  
Day: \_\_\_\_\_

Sl. No.	Check Point	Status	4:00	8:00	12:00	16:00	18:00	20:00	22:00	24:00	2:00	4:00	
<b>Primary Treatment</b>													
1	Bar Screen	Clear	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	
2	DST	Clear	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	
3	FOT Level	OK	70%	80%	70%	60%	60%	70%	70%	80%	80%	70%	
<b>STP 265 KLD</b>													
1	Inlet Flow	m <sup>3</sup> /hr											
2	Aerobic chamber	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
3	Aerator	Run/Stop	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	
4	Flow	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
5	Lamella	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
6	Sludge recirculation	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
7	Sludge Drained	Min											
8	Chlorine Dosing	On/Off	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
9	Blower Pressure	kg/cm <sup>2</sup>	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
10	Fiber left pressure	< 1.1 kg/cm <sup>2</sup>											
<b>FMR 300</b>													
1	Inlet Flow	m <sup>3</sup> /hr											
2	Aerobic chamber	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
3	Aerator	Run/Stop	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	
4	Flow	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
5	Lamella	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
6	Sludge recirculation	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
7	Sludge Drained	Min											
8	Chlorine Dosing	On/Off	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
9	Blower Pressure	kg/cm <sup>2</sup>	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
<b>FMR 200</b>													
1	Inlet Flow	m <sup>3</sup> /hr											
2	Aerobic chamber	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
3	Aerator	Run/Stop	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	
4	Flow	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
5	Lamella	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
6	Sludge recirculation	On/Off	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	
7	Sludge Drained	Min											
8	Chlorine Dosing	On/Off	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
9	Blower Pressure	kg/cm <sup>2</sup>	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
<b>Tertiary Treatment</b>													
1	BWT Level	OK	70%	70%	60%	50%	60%	60%	60%	60%	60%	60%	
2	Fiber DR pressure	< 1.1 kg/cm <sup>2</sup>											
3	Outlet flow	m <sup>3</sup> /hr											
4	Backwash Pressure	kg/cm <sup>2</sup>											
5	UV System	On/Off	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
6	UVT Level	OK	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	
7	UVF Pressure	kg/cm <sup>2</sup>	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
8	Fiber flow	Run/Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	
9	UVT Level	OK	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	
<b>UF Treatment</b>													
1	UF Feed Tank Level	OK	70%	70%	60%	50%	60%	60%	60%	60%	60%	60%	
2	Inlet Pressure	< 1.1 kg/cm <sup>2</sup>	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
3	Permeate Pressure	< 1.1 kg/cm <sup>2</sup>	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
4	Permeate Flow	< 2 m <sup>3</sup> /hr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
5	Reject Pressure	< 1.1 kg/cm <sup>2</sup>	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
6	Reject Flow	< 1.1 kg/cm <sup>2</sup>	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
7	Backwash Pressure	< 1.1 kg/cm <sup>2</sup>	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
8	Chemical Tank Level	< 10%	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
9	UF Water Tank Level	OK											
			Inlet 200 KLD	SL	Inlet 300 KLD	SL	200 KLD	Total	Outlet 500	SL	UF Outlet	200 KLD	Total
4	200 KLD		65064	65064	65064	65064	65064	65064	65064	65064	65064	65064	65064
5	300 KLD		72920	72920	72920	72920	72920	72920	72920	72920	72920	72920	72920
6	200 KLD		72920	72920	72920	72920	72920	72920	72920	72920	72920	72920	72920
Day Total			137984	137984	137984	137984	137984	137984	137984	137984	137984	137984	137984
Parameters			Level	Result	Unit	Name	Sign.	Engineers	Remarks				
1	pH	4.5 to 8.5	7.5		g								
2	TDS	< 2000 ppm	1200		g								
3	MLSS	30 to 35%	35%		g								
4	Chlorine level	3 to 10 ppm	7.5		g								
5	Colour	Colourless	4.5		g								
6	Odor	Odorless	Nil		g								

Amey  
10/11/20



## Annexure-C Water Requirement for Building

**Table 1 Water Requirements for Buildings Other than Residences**  
(Clause 4.1.2)

Sl No.	Type of Building	Domestic Per Day litre	Flushing Per Day litre	Total Consumption Per Day litre
(1)	(2)	(3)	(4)	(5)
i)	Factories including canteen where bath rooms are required to be provided	30 per head	15 per head	45 per head
ii)	Factories including canteen where no bath rooms are required to be provided	20 per head	10 per head	30 per head
iii)	Hospital (excluding laundry and kitchen) (see Note 2):			
	a) Number of beds not exceeding 100	230 per head	110 per head	340 per head
	b) Number of beds exceeding 100	300 per head	150 per head	450 per head
	c) Out patient department (OPD)	10 per head	5 per head	15 per head
iv)	Nurses' homes and medical quarters	90 per head	45 per head	135 per head
v)	Hostels	90 per head	45 per head	135 per head
vi)	Hotel (up to 3 star) excluding laundry, kitchen, staff and water bodies	120 per head	60 per head	180 per head
vii)	Hotel (4 star and above) excluding laundry, kitchen, staff and water bodies	260 per head	60 per head	320 per head
viii)	Offices (including canteen)	25 per head	20 per head	45 per head
ix)	Restaurants and food court including water requirement for kitchen:			
	a) Restaurants	55 per seat	15 per seat	70 per seat
	b) Food court	25 per seat	10 per seat	35 per seat
x)	Clubhouse	25 per head	20 per head	45 per head
xi)	Stadiums	4 per head	6 per head	10 per head
xii)	Cinemas, concert halls and theatres and multiplex	5 per seat	10 per seat	15 per seat
xiii)	Schools/Educational institutions:			
	a) Without boarding facilities	25 per head	20 per head	45 per head
	b) With boarding facilities	90 per head	45 per head	135 per head
xiv)	Shopping and retail (mall)			
	a) Staff	25 per head	20 per head	45 per head
	b) Visitors	5 per head	10 per head	15 per head
xv)	Traffic terminal stations (see Notes 3 and 4)			
	a) Airports	40 per head	30 per head	70 per head
	b) Railway stations (Junctions) with bathing facility	40 per head	30 per head	70 per head
	c) Railway stations (Junctions) without bathing facility	30 per head	15 per head	45 per head
	d) Railway Stations (Intermediate) with bathing facility	25 per head	20 per head	45 per head
	e) Railway Stations (Intermediate) without bathing facility	15 per head	10 per head	25 per head
	f) Interstate bus terminals	25 per head	20 per head	45 per head
	g) Intrastate Bus Terminals/Metro Stations	10 per head	5 per head	15 per head

### NOTES

**1** For calculating water demand for visitors, consumption of 15 litre per head per day may be taken.

**2** The water demand includes requirement of patients, attendants, visitors and staff. Additional water demand for kitchen, laundry and clinical water shall be computed as per actual requirements.

**3** The number of persons shall be determined by average number of passengers handled by stations, with due considerations given to the staff and vendors who are using these facilities.

**4** Consideration should be given for seasonal average peak requirements.

**5** The hospitals may be categorized as Category A (25 to 50 beds), Category B (51 to 100 beds), Category C (101 to 300 beds), Category D (301 to 500) and Category E (501 to 750 beds).