

WATER AND WASTE WATER AUDIT

UDALGURI COLLEGE, UDALGURI, BTR, ASSAM

Introduction:

Water is a natural resource found in the Biosphere which is essential for all living organisms. Without water, it is impossible to survive. Only 3% of Earth's water is fresh water out of which only 1.2% can be used for drinking purposes. Due to population explosion, fast urbanization, industrialization, overuse of water, etc., the demand for fresh water is continuously increasing. It is assumed that in the next few decades, millions of people around the world will find difficulty getting access to fresh water.

1.1 History of water audit:

Water auditing i.e., the methodology of tracking water loss was first introduced as a concept by the American Water Works Association (AWWA) in 1957. Since then, many states and regional water regulatory agencies have attempted to measure water loss based on the calculations carried out in the report but with little success.

In 2003, AWWA released its committee report entitled "*Applying World-wide Best Management Practices in Water Loss Control*".

The National Environmental Policy Act, of 1970 was also a driving force leading to the development of the Environmental Protection Agency (EPA) which created awareness about water conservation and efficiency.

Ministry of Water Resource, Government of India, in 2005, released general guidelines for water audit and water conservation and circulated them among the state governments and concerned institutions asking them to conduct a water audit every year.

1.2 Importance of Water Audit:

Water audit establishes-

- The quality/quantity/volume of water being used.
- Wastes of water if any
- Existence of water leakages, and excess use of water and identifies areas where consumption can be reduced.

Water audit critically examines the existing treatment systems and practices and recommends changes to improve efficiency and reduce usage.

The requirement of water depends upon several factors- population, climate, food habits, culture, work, working condition etc. It is found that approximately 150 to 200 litres of water are required for a particular person to carry out daily activities as well for drinking purposes.

According to World Health Organisation (WHO), Regional Office of Southeast Asia Schools, a student requires 2 litres water for drinking purposes and 10 to 15 litres of water for water flush toilets. Administration (staff accommodation not included) requires approximately 50 litres of water per person per day.

1.3 Water Audit:

Water audit refers to the total amount of water used in a particular area for different activities. In Udalguri College campus, water is used by staff and students (including hostel boarders) for drinking purposes, answering nature's calls, watering plants, laboratories etc.

Waste water refers to water that is transported off the campus. In the college campus, waste water includes sewerage, water from the Girls' hostel (cooking, showering, clothes washing etc.), as well as waste water from the departmental laboratories. The waste water ultimately go down in the sink or drainage system.

1.4 College Water Resources:

The main sources of water in Udalguri College are:

- Self-reliant water boring systems (for use of ground water)
- Pond water
- Rain water harvesting system
- Water from the nearby drainage system (for watering the plants on the college campus).

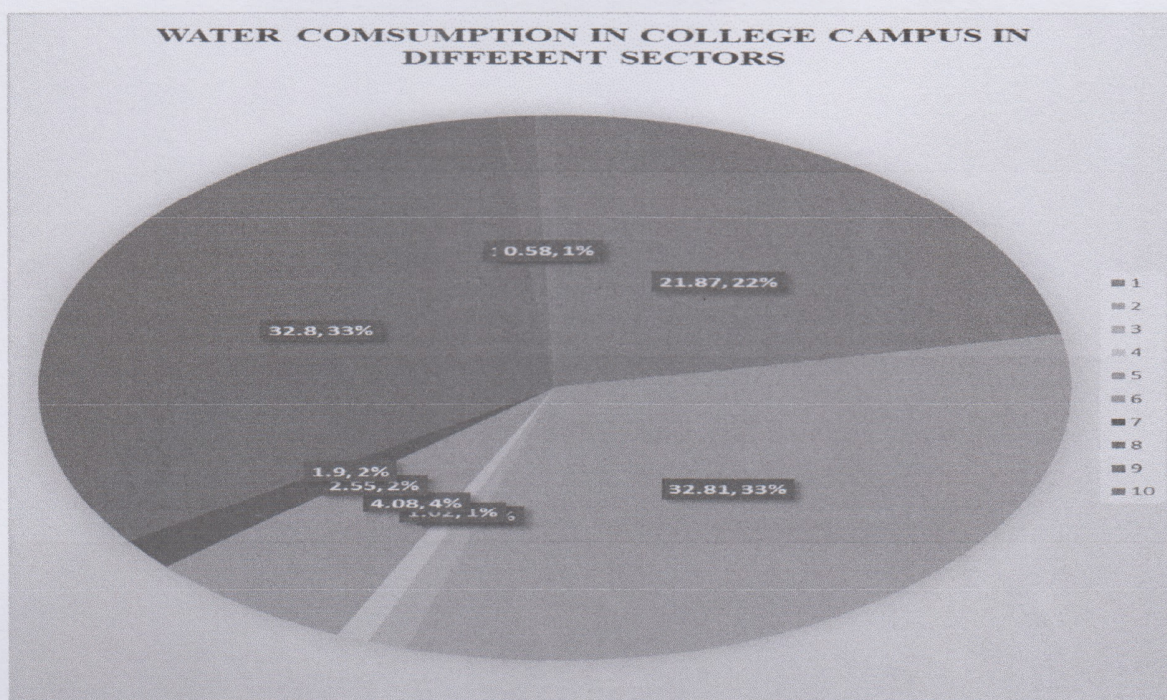
There are four over-head water tanks in the College campus (including Girls' Hostel) to supply drinking water as well as water for other activities within the College campus.

1.5 Water Consumption in the College Campus:

Following is the water consumption or utilization status in the College campus: Data from water usage in bathroom, toilets, garden, urinals including Women Hostel, wash basin, laboratories etc have been assessed and analysed which is as follows:

SL. No.	Sector	Total Daily Use (litre)	Total monthly Use (litre)	Total Yearly Use (litre)	Percentage	Remarks
1.	Bathroom	3,000	90,000	10,80,000	21.87	
2.	Toilets	4,500	13,500	1,62,000	32.81	
3.	Garden	170	5,100	61,000	1.24	
4.	Urinals including Girls' hostel	140	4,200	50,400	1.02	
5.	Wash Basin	560	16,800	2,01,600	4.08	
6.	Laboratories	350	10,500	1,26,000	2.55	
7.	Shower	260	7,800	93,600	1.90	
8.	Drinking	4,500	13,500	16,20,000	32.80	
9.	Water loss during filling	156	4,680	56,160	1.14	
10.	Water loss due to discharge	80	2,400	28,800	0.58	

1. Bathroom 2. Toilet 3. Garden 4. Urinal (including Women Hostel) 5. Wash Basin 6. Laboratories 7. Showers 8. Drinking 9. Water Loss during Filling 10. Water loss due to Discharge



Color Codes: 1. Bathroom, 2. Toilets, 3. Garden, 4. Urinals inclusive of Girls Hostel too, 5. Wash Basin, 6. Laboratories, 7. Shower, 8. Drinking, 9. Water Loss during filling, 10. Water loss due to discharge

1.6 Assessment of Water Quality:

Water is essential for all living organisms. Water used for drinking purposes should be clear, odorless, good taste and contain components within the permissible limits. The Quality of water and the presence of water pollutants which can damage aquatic life and affect the environment can be assessed by surface water monitoring.

Water from different sources has been collected for analysis. The samples are collected at regular intervals and analyzed for various parameters such as colour, odor, P^H , turbidity, presence of nutrients etc. To determine the overall health and suitability for various uses such as drinking, irrigation and aquatic life support etc., quality assessment is required for evaluating the Physical, Chemical and biological characteristics.

The main objective of water quality assessment of water is to obtain quantitative information on the physical, chemical and bio-logical characteristics of water available within Udalguri College campus, Udalguri. Our main aim is to detect whether the components of water in the College campus is within permissible limit or not.

The parameters such as taste, colour, odour, P^H , turbidity, presence of nutrients such as Iron, Fluorides, Chlorides etc., TDS, Alkalinity, total hardness and bacteria (using H_2S vial) of water have been analyzed and after comparing the result with the standard values (permissible limit) inferences have drawn as follows:

1.7 Result and Discussion:

Five (5) samples from different sites of college campus have been collected for analysis-

Sample-1: Water from College Auditorium

Sample-2: Water from College Girls' hostel

Sample-3: Water from College Laboratory

Sample-4: Running water from administrative building

Sample 5: Water from Conference Hall (old teachers' common room)

After collection, the samples were sent to the Govt. Public Health Engineering (PHE) Department, Assam for analysis and at the same time analysis was carried out at the Department of Chemistry, Udalguri College, Udalguri.

The data obtained from Public Health Engineering (PHE), Govt of Assam are attached as APPENDIX-I, II, III, IV & V. APPENDIX-VI contains the analysis of data while APPENDIX -VII contain the desirable limit and Maximum permissible limit for different contents of water as analyzed by the Department of Chemistry, Udalguri College, Udalguri.

1.8 Waste-water Management:

Since the College has a big campus consisting of laboratory, toilets, bathrooms (Girls' Hostel), lot of wastewater gets generated. The wastewater from Laboratories is allowed to fall on the main drain of the college boundary drain.

1.9 Rainwater Harvesting:

The underground water table is decreasing day by day and minute by minute. The reason is that no attempt is made to replenish the groundwater table with rainwater during the monsoon, and other rainy days.

During the rainy season, lots of rainwater goes to waste in the gutters. So, harvesting rainwater is very important and essential. The College has more than one rainwater harvesting tank. This harvested water is used in different types of activities like watering plants on the College campus, and flower gardens in different blocks. Also, harvested water is used for the purpose of washing and cleaning floors, and veranda of the college.

To reduce wastewater, some common measures should be adopted by every employee and Staff associated with the College.

During practical processes in Science Laboratories, lots of water is wasted so the College needs to adopt a system to recycle the wastewater. Again, during the production of Distilled Water in the Laboratories, a large amount of normal water is used (for 1 Litre of Distilled Water, 33 litres of normal water is required). So, to avoid loss of water in the college, a good design for the Distilled water plant is necessary.

The following measures may be adopted to avoid loss of water-

- (i) To Reduce chemical waste (liquids) formation in the chemistry laboratory, the concept of green chemistry should be adopted.
- (ii) The pipes, overhead tanks and plumbing system should be regularly checked and repaired if necessary.

- (iii) The College should install its own Sewage Treatment Plants (STP) and by doing so there will be a reduction in water usage, and the treated water can be used for various purposes.
- (iv) Although the college has its own rainwater harvesting units, besides these, the college authority has decided to set up and install some rainwater harvesting units.

1.10 Waste Management:

As we know, after having some developing works or any kind of consumption, there will be some waste material remains behind.

Since the college campus occupies a large area (about 33 bighas) and lots of developing work is going on all through the year, there has been an accumulation of different types of waste in the college campus.

Among the different wastes, some are bio-degradable and some of them are non-biodegradable. Further, these may be classified into two categories- Solid waste and Liquid waste depending on the physical state of waste.

Some of the solid and Liquid Bio-degradable and non-biodegradable wastes in the college campus are listed below-

(A) The common Solid wastes are-

- (i) Used papers
- (ii) Broken desks and benches
- (iii) Unused wood pieces
- (iv) Iron rod
- (v) Small plants and leaves
- (vi) Articles of plastic such water water bottles, carry bags, chairs, tables etc.
- (vii) Unused and broken tin sheets
- (viii) Glass articles from laboratories
- (ix) e-waste, unused clothes etc.

(B) The common Liquid wastes are-


- (i) Wastewater from laboratories
- (ii) Wastewater from toilets
- (iii) Waste/used chemicals etc.

Among the wastes, non-biodegradable wastes like plastics, iron rods, cement, e-waste etc. are sent for recycling purposes. Bio-degradable wastes like paper, clothes, plants etc. are being sent for recycled or decomposed within the college campus.

Laboratory wastes, such as liquid used chemicals and solutions are drained out from the college campus through the main drain just near the boundary wall. Also, the wastewater from toilets, bathrooms are reused in the gardens and plants.

APPENDIX-I

Laboratory Name: SUB DIVISION LEVEL LABORATORY, UDALGURI
 Address: Office of The Asstt. Executive Engineer (PHE) Udalguri Sub Division Udalguri. 784509
 Email id: sdlludalguri@gmail.com
 Ph. No.: 03711-295196



TEST REPORT


Test Report No.: _____
 Sample Description: Block: Roarata VDC: Purani Garabari
 Village: Purani Garabari Habitation: _____
 Sample Type: Shallow well
 Sample Collected on dated: 11/05/2023 Sample Received on dated: 11/05/2023
 Sample Location: Udalguri College (Common Room)
 Sample Quantity: 01
 Date of Analysis started: 11/05/2023
 Dated of analysis completed: 11/05/2023
 Latitude (N): _____ Longitude (E): _____

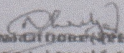
RESULTS


Sr. No	Parameter	Protocol Used	Results	Time of Test	IS: 10500:2012 (Second Revision)		Units
					Desirable Limit	Max. Permissible Limit (in absence better alternate source)	
1	Colour	IS: 3025 (Part 4)	<u>5</u>	---	5	15	Hazen Units
2	Odour	IS: 3025 (Part 5)	<u>Agreeable</u>	---	Agreeable	Agreeable	---
3	Taste	IS: 3025 (Part 8)	<u>Agreeable</u>	---	Agreeable	Agreeable	---
4	pH	IS 3025 (Part 11)	<u>6.96</u>	---	6.5-8.5	No Relaxation	pH Units
5	Turbidity	IS: 3025 (Part 10)	<u>0.14</u>	---	1	5	NTU
6	TDS	IS: 3025 (Part 16)	<u>86.5</u>	---	500	2000	Mg/L
7	Iron	APHA 3500 Fe B	<u>0.04</u>	---	1	No Relaxation	Mg/L
8	Fluoride	APHA 4500 F-D	<u>0.32</u>	---	1	1.5	Mg/L
9	Arsenic	IS: 3025 (Part 37)	---	---	0.01	No Relaxation	Mg/L
10	Nitrate	IS:3025 (Part 34)	---	---	45	No Relaxation	Mg/L
11	Sulphate	IS: 3025 (Part 24)	---	---	200	400	Mg/L
12	Total Alkalinity	IS: 3025 (Part 23)	<u>90</u>	---	200	600	Mg/L
13	Chloride	IS: 3025 (Part 32)	<u>31.19</u>	---	250	1000	Mg/L
14	Total Hardness	IS: 3025 (Part 21)	<u>102</u>	---	200	600	Mg/L
15	Magnesium	APHA 3500- Mg B	---	---	30	100	Mg/L
16	Calcium	IS 3025 (Part 40)	---	---	75	200	Mg/L
17	Residual Chlorine	APHA 4500-Cl B	---	---	0.2	1	Mg/L
18	Bacteria Test (Using H ₂ S Vial)	---	<u>absent</u>	---	---	---	---

Remarks: The water Parameters are found in safe range.

Notes:
 1. The results given above are related to the sample as recovered and tested in this laboratory. Reliability of sample lies with the sender
 2. The test report cannot be regenerated/re-produced in whole or in part without written permission of Laboratory
 3. The test report cannot be used for any publicity or any legal purpose
 4. The test samples meant for chemical analysis will be disposed of after 7 (Seven) days from the date of issue of test report unless until specifically requested by the customer for retaining over a longer period.


 Authorised Signatory
 Quality Manager
 SDLL Udalguri
 Sub-Division Udalguri


 Noted Officer (PHE)
 Sub-Division Level Laboratory
 Udalguri Sub-Division Udalguri


 Asstt. Executive Engineer (PHE)
 Udalguri Sub-Division Udalguri

END of TEST REPORT

APPENDIX-II

Laboratory Name: SUB DIVISION LEVEL LABORATORY, UDALGURI
 Address: Office of The Asstt. Executive Engineer (PHE) Udalguri Sub Division Udalguri. 784509
 Email id: sddludalguri@gmail.com
 Ph. No.: 03711-295196



TEST REPORT

Test Report No.: _____
 Sample Description: Block: Roseta VCDC: Purani Garabari
 Village: Purani Garabari Habitation: _____
 Sample Type: Shallow well
 Sample Collected on dated: 11/05/2023 Sample Received on dated: 11/05/2023
 Sample Location: Udalguri College (Running water Administrative Building)
 Sample Quantity: 01
 Date of Analysis started: 11/05/2023
 Dated of analysis completed: 11/05/2023
 Latitude (N): _____ Longitude (E): _____

RESULTS

Sr. No	Parameter	Protocol Used	Results	Time of Test	IS: 10500:2012 (Second Revision)		Units
					Desirable Limit	Max. Permissible Limit (In absence better alternate source)	
1	Colour	IS: 3025 (Part 4)	5	—	5	15	Hazen Units
2	Odour	IS: 3025 (Part 5)	Agreeable	—	Agreeable	Agreeable	—
3	Taste	IS: 3025 (Part 8)	Agreeable	—	Agreeable	Agreeable	—
4	pH	IS 3025 (Part 11)	7.06	—	6.5-8.5	No Relaxation	pH Units
5	Turbidity	IS: 3025 (Part 10)	0.12	—	1	5	NTU
6	TDS	IS: 3025 (Part 16)	99.7	—	500	2000	Mg/L
7	Iron	APHA 3500 Fe B	0.05	—	1	No Relaxation	Mg/L
8	Fluoride	APHA 4500 F-D	0.22	—	1	1.5	Mg/L
9	Arsenic	IS: 3025 (Part 37)	—	—	0.01	No Relaxation	Mg/L
10	Nitrate	IS: 3025 (Part 34)	—	—	45	No Relaxation	Mg/L
11	Sulphate	IS: 3025 (Part 24)	—	—	200	400	Mg/L
12	Total Alkalinity	IS: 3025 (Part 23)	84	—	200	600	Mg/L
13	Chloride	IS: 3025 (Part 32)	29.77	—	250	1000	Mg/L
14	Total Hardness	IS: 3025 (Part 21)	90	—	200	600	Mg/L
15	Magnesium	APHA 3500- Mg B	—	—	30	100	Mg/L
16	Calcium	IS 3025 (Part 40)	—	—	75	200	Mg/L
17	Residual Chlorine	APHA 4500-Cl B	—	—	0.2	1	Mg/L
18	Bacteria Test (Using H ₂ S Vial)	—	absent	—	—	—	—

Remarks: The water Parameters are Found in safe range.

Notes:

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(Signature)
 Assistant Engineer
 SDLL Udalguri PHE
 Lab. Name: SDLL Udalguri
 Sub-Division: Udalguri

(Signature)
 Nodal Officer (PHE)
 Sub-Division Level Laboratory
 Udalguri Sub-Division Udalguri

(Signature)
 Asstt. Executive Engineer (PHE)
 Udalguri Sub-Division Udalguri
 Udalguri

APPENDIX-III

Laboratory Name: SUB DIVISION LEVEL LABORATORY, UDALGURI
Address: Office of The Asstt. Executive Engineer (PHE) Udalguri Sub Division Udalguri. 784509
Email id: sdlludalguri@gmail.com
Ph. No.: 03711-295196



TEST REPORT

Test Report No.: _____
 Sample Description: Block: Roosta VCDG: Purani Garaibari
 Village: Purani Garaibari Habitation: _____
 Sample Type: Shallow well
 Sample Collected on dated: 11/05/2023 Sample Received on dated: 11/05/2023
 Sample Location: Udalguri College (Labs (Bot, Zoo, Chem))
 Sample Quantity: 0.1
 Date of Analysis started: 11/05/2023
 Dated of analysis completed: 11/05/2023
 Latitude (N): _____ Longitude (E): _____

RESULTS

Sr. No	Parameter	Protocol Used	Results	Time of Test	IS: 10500:2012 (Second Revision)		Units
					Desirable Limit	Max. Permissible Limit (in absence better alternate source)	
1	Colour	IS: 3025 (Part 4)	<u>5</u>	—	5	15	Hazen Units
2	Odour	IS: 3025 (Part 5)	<u>Agreeable</u>	—	Agreeable	Agreeable	—
3	Taste	IS: 3025 (Part 8)	<u>Agreeable</u>	—	Agreeable	Agreeable	—
4	pH	IS: 3025 (Part 11)	<u>6.84</u>	—	6.5-8.5	No Relaxation	pH Units
5	Turbidity	IS: 3025 (Part 10)	<u>0.02</u>	—	1	5	NTU
6	TDS	IS: 3025 (Part 16)	<u>84.1</u>	—	500	2000	Mg/L
7	Iron	APHA 3500 Fe B	<u>0.03</u>	—	1	No Relaxation	Mg/L
8	Fluoride	APHA 4500 F-D	<u>0.21</u>	—	1	1.5	Mg/L
9	Arsenic	IS: 3025 (Part 37)	—	—	0.01	No Relaxation	Mg/L
10	Nitrate	IS: 3025 (Part 34)	—	—	45	No Relaxation	Mg/L
11	Sulphate	IS: 3025 (Part 24)	—	—	200	400	Mg/L
12	Total Alkalinity	IS: 3025 (Part 23)	<u>82</u>	—	200	600	Mg/L
13	Chloride	IS: 3025 (Part 32)	<u>28.36</u>	—	250	1000	Mg/L
14	Total Hardness	IS: 3025 (Part 21)	<u>92</u>	—	200	600	Mg/L
15	Magnesium	APHA 3500-Mg B	—	—	30	100	Mg/L
16	Calcium	IS: 3025 (Part 40)	—	—	75	200	Mg/L
17	Residual Chlorine	APHA 4500-Cl B	—	—	0.2	1	Mg/L
18	Bacteria Test (Using H ₂ S Vial)	—	<u>absent</u>	—	—	—	—

Remarks: The water parameters are found in safe range.

Notes:

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(Signature)
 Authorized Signatory
 Quality Manager
 SDLL Udalguri (PHE)
 Lab. Name: SDLL, Udalguri
 Sub-Division Udalguri

(Signature)
 Nodal Officer (PHE)
 Sub-Division Level Laboratory
 Udalguri Sub-Division Udalguri

(Signature)
 Asstt. Executive Engineer (PHE)
 Udalguri Sub-Division Udalguri
 Udalguri

END of TEST REPORT

APPENDIX-IV

Laboratory Name: SUB DIVISION LEVEL LABORATORY, UDALGURI
Address: Office of The Asstt. Executive Engineer (PHE) Udalguri Sub Division Udalguri. 784509
Email id: sdlludalguri@gmail.com
Ph. No.: 03711-295196



TEST REPORT

Test Report No.: _____
Sample Description: Block: Roacta VCDC: Purani Garaibari
 Village: Purani Garaibari Habitation: _____
Sample Type: Shallow well
Sample Collected on dated: 11/05/2023 **Sample Received on dated:** 11/05/2023
Sample Location: Udalguri College (Girls' Hostel)
Sample Quantity: 01
Date of Analysis started: 11/05/2023
Dated of analysis completed: 11/05/2023
Latitude (N): _____ **Longitude (E):** _____


RESULTS

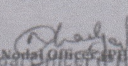
Sr. No	Parameter	Protocol Used	Results	Time of Test	IS: 10500:2012 (Second Revision)		Units
					Desirable Limit	Max. Permissible Limit (In absence better alternate source)	
1	Colour	IS: 3025 (Part 4)	<u>5</u>	---	5	15	Hazen Units
2	Odour	IS: 3025 (Part 5)	<u>Agreeable</u>	---	Agreeable	Agreeable	---
3	Taste	IS: 3025 (Part 6)	<u>Agreeable</u>	---	Agreeable	Agreeable	---
4	pH	IS: 3025 (Part 11)	<u>6.69</u>	---	6.5-8.5	No Relaxation	pH Units
5	Turbidity	IS: 3025 (Part 10)	<u>0.09</u>	---	1	5	NTU
6	TDS	IS: 3025 (Part 16)	<u>81.8</u>	---	500	2000	Mg/L
7	Iron	APHA 3500 Fe B	<u>0.03</u>	---	1	No Relaxation	Mg/L
8	Fluoride	APHA 4500 F: D	<u>0.30</u>	---	1	1.5	Mg/L
9	Arsenic	IS: 3025 (Part 37)	---	---	0.01	No Relaxation	Mg/L
10	Nitrate	IS: 3025 (Part 34)	---	---	45	No Relaxation	Mg/L
11	Sulphate	IS: 3025 (Part 24)	---	---	200	400	Mg/L
12	Total Alkalinity	IS: 3025 (Part 23)	<u>68</u>	---	200	600	Mg/L
13	Chloride	IS: 3025 (Part 32)	<u>38.28</u>	---	250	1000	Mg/L
14	Total Hardness	IS: 3025 (Part 21)	<u>80</u>	---	200	600	Mg/L
15	Magnesium	APHA 3500- Mg B	---	---	30	100	Mg/L
16	Calcium	IS: 3025 (Part 40)	---	---	75	200	Mg/L
17	Residual Chlorine	APHA 4500-Cl B	---	---	0.2	1	Mg/L
18	Bacteria Test (Using H ₂ S Vial)	---	<u>absent</u>	---	---	---	---


Remarks: The water parameters are found in safe range.

Notes:

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Authorized Signatory
Asstt. Chemist/Quality Manager
 SDLL, Udalguri
 Lab. Name: SDLL, Udalguri


Notary Officer (PHE)
 Sub-Division Level Laboratory
 Udalguri Sub-Division Udalguri


Asstt. Executive Engineer (PHE)
 Udalguri Sub-Division
 Udalguri

END of TEST REPORT

ANNEXURE-V

Laboratory Name: SUB DIVISION LEVEL LABORATORY, UDALGURI
 Address: Office of The Asstt. Executive Engineer (PHE) Udalguri Sub Division Udalguri. 784509
 Email Id: sdlludalguri@gmail.com
 Ph. No.: 03711-295196



TEST REPORT

Test Report No.:
 Sample Description: Block: Roata VCDC: Purani Garai Bari
 Village: Purani Garai Bari Habitation: —
 Sample Type: Shallow well
 Sample Collected on dated: 11/05/2023 Sample Received on dated: 11/05/2023
 Sample Location: Udalguri College (Auditorium)
 Sample Quantity: 01
 Date of Analysis started: 11/05/2023
 Dated of analysis completed: 11/05/2023
 Latitude (N): — Longitude (E): —

RESULTS

Sr. No	Parameter	Protocol Used	Results	Time of Test	IS: 10500:2012 (Second Revision)		Units
					Desirable Limit	Max. Permissible Limit (In absence better alternate source)	
1	Colour	IS: 3025 (Part 4)	5	—	5	15	Hazen Units
2	Odour	IS: 3025 (Part 5)	Agreeable	—	Agreeable	Agreeable	—
3	Taste	IS: 3025 (Part 8)	Agreeable	—	Agreeable	Agreeable	—
4	pH	IS 3025 (Part 11)	7.13	—	6.5-8.5	No Relaxation	pH Units
5	Turbidity	IS: 3025 (Part 10)	0.11	—	1	5	NTU
6	TDS	IS: 3025 (Part 16)	136.7	—	500	2000	Mg/L
7	Iron	APHA 3500 Fe B	0.03	—	1	No Relaxation	Mg/L
8	Fluoride	APHA 4500 F-D	0.33	—	1	1.5	Mg/L
9	Arsenic	IS: 3025 (Part 37)	—	—	0.01	No Relaxation	Mg/L
10	Nitrate	IS: 3025 (Part 34)	—	—	45	No Relaxation	Mg/L
11	Sulphate	IS: 3025 (Part 24)	—	—	200	400	Mg/L
12	Total Alkalinity	IS: 3025 (Part 23)	124	—	200	600	Mg/L
13	Chloride	IS: 3025 (Part 32)	28.36	—	250	1000	Mg/L
14	Total Hardness	IS: 3025 (Part 21)	120	—	200	600	Mg/L
15	Magnesium	APHA 3500-Mg B	—	—	30	100	Mg/L
16	Calcium	IS 3025 (Part 40)	—	—	75	200	Mg/L
17	Residual Chlorine	APHA 4500-Cl B	—	—	0.2	1	Mg/L
18	Bacteria Test (Using H ₂ S Vial)	—	absent	—	—	—	—

Remarks: The water parameters are found in safe range.

Notes:

- The results given above are related to the sample as recovered and tested in this laboratory. Reliability of sample lies with the sender
- The test report cannot be regenerated/re-produced in whole or in part without written permission of Laboratory
- The test report cannot be used for any publicity or any legal purpose
- The test samples meant for chemical analysis will be disposed of after 7 (Seven) days from the date of issue of test report unless until specifically requested by the customer for retaining over a longer period.

Authorized Signatory
 Quality Manager
 SDLL Udalguri
 Sub-Division Udalguri

Nodal Officer (PHE)
 Sub-Division Level Laboratory
 Udalguri Sub-Division Udalguri

Asstt. Executive Engineer (PHE)
 Udalguri Sub-Division Udalguri

END of TEST REPORT

Following are the results obtained from PHE Department, Govt. of Assam and Department of Chemistry, Udalguri College, Udalguri:

- (i) It is found that sample-2 and Sample-3 are acidic in nature and sample-1, Sample-4 and sample-5 are basic or alkaline in nature.
- (ii) For all the samples odor and taste are agreeable with the standard values.
- (iii) Turbidity for all the samples is below the permissible limit of 5 (IS: 3025, Part-10).
- (iv) TDS for all samples is below the maximum permissible limit of 2000 mgL⁻¹.
- (v) Minerals such as Iron, Fluoride, Chloride etc. are within permissible limit.
- (vi) Total hardness as well as alkalinity of the samples were found within the permissible limit.
- (vii) Bacteria was absent in all the samples.

Conclusion:

From the quality assessment, it is found that the water available in the Auditorium, Girls' Hostel, Administrative Building, Conference Hall (old Teachers' Common Room), and Laboratories are safe for use, The samples do not contain any harmful components above permissible limit.

APPENDIX-VI

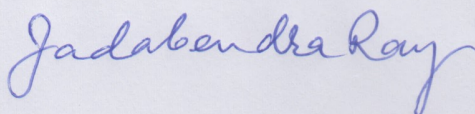
Result obtained from the tests performed for different components of water

SL. No.	Category of Tests	Sample -1		Sample -2		Sample -3		Sample -4		Sample -5	
		Govt. PHE Lab.	Udalguri College Chemistry Lab.	Govt. PHE Lab.	Udalguri College Chemistry Lab.	Govt. PHE Lab.	Udalguri College Chemistry Lab.	Govt. PHE Lab.	Udalguri College Chemistry Lab.	Govt. PHE Lab.	Udalguri College Chemistry Lab.
1.	Color	5	5	5	5	5	5	5	5	5	5
2.	Odor	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4.	pH	7.13	7.10	6.69	6.7	6.84	6.91	7.06	7.02	6.96	7.01
5.	Turbidity	0.11	0.12	0.09	0.12	0.02	0.03	0.12	0.11	0.14	0.12
6.	TDS	126.7	125	81.8	79.2	84.1	80.0	99.7	101.00	86.5	84.5
7.	Iron	0.03	0.03	0.03	0.04	0.03	0.04	0.05	0.06	0.04	0.04
8.	Fluoride	0.33	0.22	0.30	0.31	0.21	0.25	0.22	0.26	0.32	0.30
9.	Total Alkalinity	124	121	68	69	82	84	84	88	80	82
10.	Chloride	28.36	29.00	38.28	36.00	28.36	32.02	29.77	30.11	31.19	30.5
11.	Total Hardness	130	136	80	86	92	94	90	99	102	99
12.	Bacteria Test (Using H ₂ S vial)	Bacteria absent	Bacteria absent	Bacteria absent	Bacteria absent	Bacteria absent	Bacteria absent	Bacteria absent	Bacteria absent	Bacteria absent	Bacteria absent

APPENDIX-VII

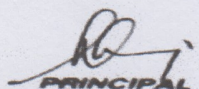
Desirable and Maximum Permissible limits of components present in water

SL. No.	Parameters	Protocol Used	Limits	
			Desirable Limit	Maximum Permissible Limit
1.	Color	IS: 3025 (Part-4)	5	15
2.	Odor	IS: 3025 (Part-5)	Agreeable	Agreeable
3.	Taste	IS: 3025 (Part-8)	Agreeable	Agreeable
4.	p ^H	IS: 3025 (Part-11)	6.5-8.5	No relaxation
5.	Turbidity	IS: 3025 (Part-10)	1	5
6.	TDS	IS: 3025 (Part-16)	500 mgL ⁻¹	2000 mgL ⁻¹
7.	Iron	APHA 3500 Fe B	1	No relaxation
8.	Fluoride	APHA 4500 F-D	1 mgL ⁻¹	1.5 mgL ⁻¹
9.	Total Alkalinity	IS: 3025 (Part-23)	200 mgL ⁻¹	600 mgL ⁻¹
10.	Chloride	IS: 3025 (Part-32)	250 mgL ⁻¹	1000 mgL ⁻¹
11.	Total Hardness	IS: 3025 (Part-21)	200 mgL ⁻¹	600 mgL ⁻¹
12.	Bacteria Test (Using H ₂ S vial)	---	---	---



(Jadabendra Roy)
Convenor

Water and Waste Water Audit Team



PRINCIPAL
UDALGURI COLLEGE
UDALGURI

(Dr. Luke Daimary)
Principal
Udalguri College

