

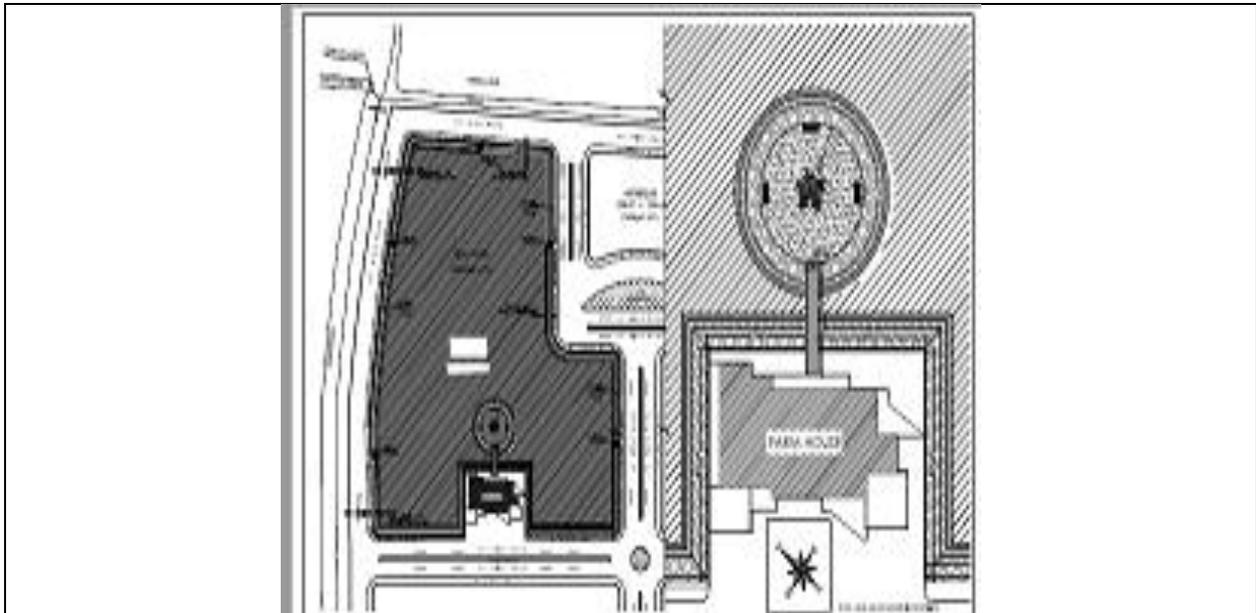


SDG 6: Clean Water & Sanitation

Without water we can't live. Clean water is vital. However, due to bad economics or poor infrastructure, millions of people including children die every year from diseases associated with inadequate water supply, sanitation and hygiene. Ziauddin University focused on safe water and sanitation as they are key foundations for good health. By managing our water sustainably, we are also able to achieved our sustainable goal.

• Water Conservation Mechanism

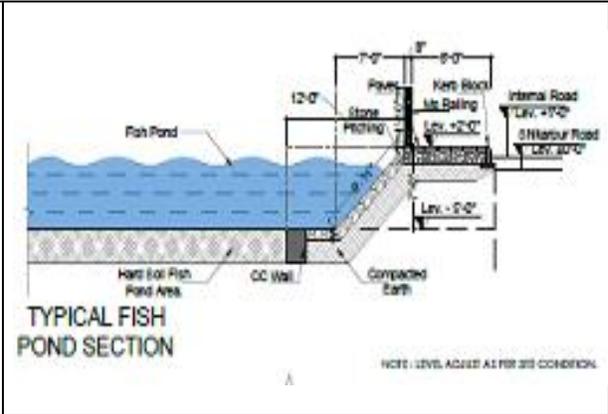
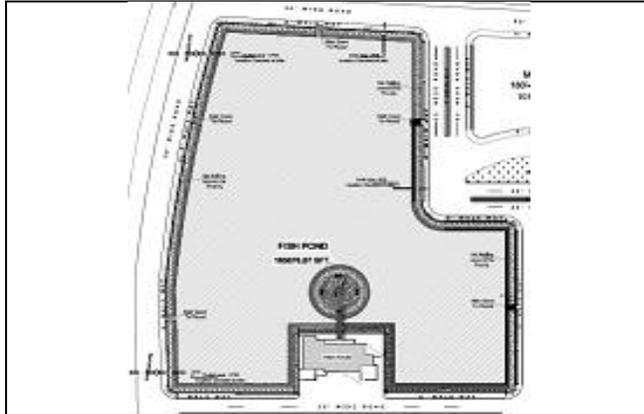
- Most of the buildings of the Ziauddin University have a separate system, for waste water and for clean water (rainwater). Rain water is thus collected from the roofs of the buildings and is then discharged into the local ponds and canals around the buildings. The university also has buildings where all the rainwater is collected for toilet flushing and for watering the plants inside the building. At our campus we have a separate sewerage system. We collect rainwater from the roof, parking area etc. and discharge this in the ponds and channels at our campus.
- Clifton side is located near the sea, and the average TDS of seawater is 45000, therefore, RO plants are used for recycling the seawater for general and drinking usages. The water is stored in underground tanks. The average capacity of the underground water tank of the Ziauddin University Clifton is 110,000 gallons/day.
- On the other hand, Ziauddin University, North Nazimabad Site, uses the bore water and RO plants are used for recycling the bore water for general and drinking usages. The water is stored in underground tanks. The average capacity of the underground water tank of Ziauddin University, North Nazimabad is 76,500 gallons/day.
- The average water tank capacity of Ziauddin University is 1.865 lacs gallon/day.



Drawing of Conservation of Rain Water Collection (Ziauddin University)

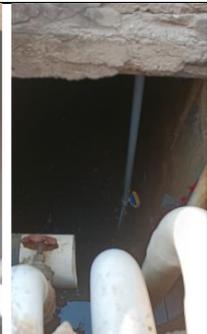


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Water Conservation - In Ground Water Tank

Construction Level of Pond (Ziauddin University)



Water Storage tanks at different location of Ziauddin University



- **Water Recycling Implementation**

The Clifton site of the Ziauddin University is located near the sea, and the average TDS of seawater is 45000, therefore, **RO plants** are used for recycling the seawater that reduces the TDS to 450 - 500. This water is used for general usage. For drinking, the water is further treated by another small RO plant.

The other campuses of Ziauddin University use the **bore water** after RO treatment. Water is filtered with R.O plants at Clifton and North campus. Ziauddin Clifton Campus underground water tank facility is 110,000 gallons per day and 76,500 gallons of water tank capacity at Ziauddin North Campus. The average recycling capacity of R.O plants at North campus is about 80,012 from which 52,008 gallons of water are consumable and the remaining 28,004 gallons are non-consumable/ nor drinking water. The distribution of water is done by the maintenance department.



R.O Plant at Ziauddin University for water recycling



ZIAUDDIN UNIVERSITY

A **Sprinkler (water meter)** is installed to measure the amount of water that has been used. This is to balance the supply of water in plants and fields so that each plant grows and takes water according to their requirement. Through this we have changed the old method of watering plants to a **drip irrigation system** and reduced the water wastage and sprinkler only opens when plants need water and they supply in the needed quantity because each drop is important for us. The R.O plant rejected water is about 28,004 gallons is used for recycling purpose in washroom cleaning and flush and drip irrigation etc.

Most of the buildings of the Ziauddin University have a separate system, for waste water and for clean water (rainwater). Rain water is thus collected from the roofs of the buildings and is then discharged into the local ponds and canals around the buildings. The university also has buildings where all the rainwater is collected for toilet flushing and for watering the plants inside the building. At our campus we have a separate sewerage system. We collect rainwater from the roof, parking area etc. and discharge this in the ponds and gardening plants through sprinkler (drip irrigation system).



Sprinkler used to proper supply R eusedWater for Plantation through drip irrigation system



- **Consumption of treated water**

- Water installation of treated-water and it is consumed by students, staff and Patients, it is located at Ziauddin Hospital North & Clifton Campus & Universities.
- Ziauddin Hospital & Clifton Campus & Universities have reserved water for 3 days in underground water tanks due to incase of water crisis in the city & also level maintenance in 6 feet due to the pump not picking water from level 8 Inch. (Total Capacity of Underground Tank 110000 at Clifton and 76500 at North).
- The average daily consumption of treated water at Ziauddin University is about 97,000 gallons at Clifton Campus and 84,408 at Ziauddin North campus which is about 181,408 daily consumptions.



Example of Consumption of treated water in Ziauddin University

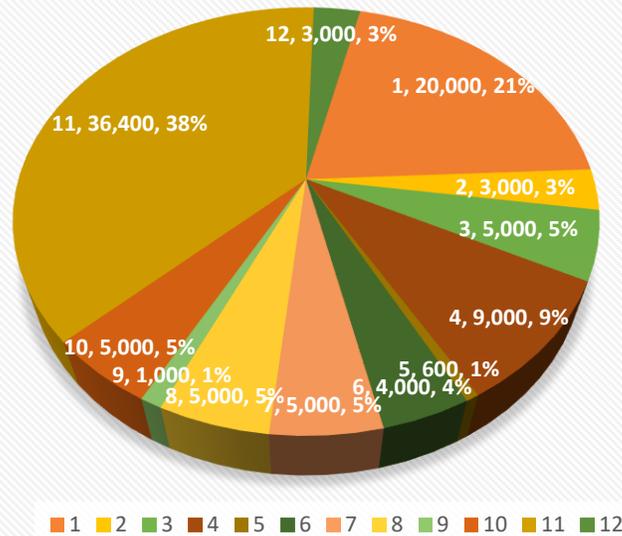


Water consumption Graph of Ziauddin Hospital & University Clifton

Details of Daily Water Consumption Sheet Per Day

Details of Daily Water Consumption Sheet Per Day			
1	Chiller plant is taking water Gallon per day by 2hp water pump for both cooling towers. (12000 - 15000) (As per requirement)	20,000	Gallon
2	Chiller plant is also taking water for servicing of AHU.	3,000	Gallon
3	Housekeeping is taking water in every day due to cleaning of outside area & given water to garden & plants.	5,000	Gallon
4	Dialysis water/Lab water (Low IDS) Water	9,000	Gallon
5	Cooling tower (both) of Engine 1.2 MW is used water due to engine cooling.	600	Gallon
6	Maintenance/ service of the RO plant	4,000	Gallon
7	FSD, water use for making breakfast, lunch & dinner & also washing work	5,000	Gallon
8	Linen store, water use for washing of cloths (tank size:4' x 3' x 3'=36 cft x 6.2 cft = Gallon x 10 times =GPD x day x CPG = CPM)	5,000	Gallon
9	House Keeping, water use for washing of washroom	1,000	Gallon
10	CSSD, water for washing (2 machine) (500 gallon per cycle x 5 cycle x per machine)	5,000	Gallon
11	Hospital, water use other areas (Zone A, B, C, D, E) OT, SICU, MICU, HDU, Pantry & water coolers)	36,400	Gallon
12	Water use in Nursing Hostel Flats. (Daily Basis) (Flat # H-208, J-209, L-411, H-108, K-110, C-103)	3,000	Gallon
Total Consumption of Water per day (Approximately)		97,000	Gallon
Note:	We have reserved water for 3 days in under ground water tank due to incase of water crisis in city & also level maintain in 6 feet due to the pump is not picking water from level 8 Inch. (Total Capacity of Under Ground Tank 1,10,000/-)		
Manager Maintenance & Services			

Total consumption of water per day (approximately) graph



Example of Consumption of treated water in Ziauddin University Clifton Campus



All Three Shifts										in 24 Hrs.		Mailing Date:	27/10/2023	Reporting Date:	25/10/2023
TIME	MAIN U/GROUND TANK		R.O Finish Product		R.O RAW Water		R.O Rejected Water	R.O Well Water		REMARKS					
	Level-feet	Capacity-Gallons	Level-feet	Capacity-Gallons	Level-feet	Capacity-Gallons	Capacity-Gallons	Capacity-Gallons							
8:00	5.5	16,363	10	36,850	8	29,480	35,716	102,046							
9:00	6.5	19,338	10	36,850	8	29,480	35,716	102,046							
10:00	6.5	19,338	10.5	38,693	8	29,480	36,708	104,881							
11:00	7	20,825	10.5	38,693	8	29,480	36,708	104,881							
12:00	7	20,825	10.5	38,693	8.5	31,323	37,700	107,715							
1:00	7	20,825	10	36,850	8.5	31,323	36,708	104,881							
14:00	6.5	19,338	10	36,850	8.5	31,323	36,708	104,881							
15:00	6.5	19,338	10.5	38,693	9	33,165	38,693	110,550							
16:00	6	17,850	9	33,165	9	33,165	35,716	102,046							
17:00	7	20,825	9	33,165	9	33,165	35,716	102,046							
18:00	6.5	19,338	9.5	35,008	8	29,480	34,724	99,212							
19:00	5.5	16,363	10	36,850	8	29,480	35,716	102,046							
20:00	4.5	13,388	10	36,850	8	29,480	35,716	102,046							
21:00	4.5	13,388	10.5	38,693	9	33,165	38,693	110,550							
22:00	3	8,925	10.5	38,693	9	33,165	38,693	110,550							
23:00	3	8,925	10.5	38,693	9	33,165	38,693	110,550							
0:00	2.5	7,438	10	36,850	3.5	12,898	26,787	76,535							
1:00	3	8,925	10	36,850	3.5	12,898	26,787	76,535							
2:00	4	11,900	10	36,850	3.5	12,898	26,787	76,535							
3:00	4	11,900	10	36,850	3.5	12,898	26,787	76,535							
4:00	4.5	13,388	10	36,850	3.5	12,898	26,787	76,535							
5:00	5	14,875	10	36,850	3.5	12,898	26,787	76,535							
6:00	6	17,850	10	36,850	8	29,480	35,716	102,046							
7:00	5	14,875	10.5	38,693	8.5	31,323	37,700	107,715							
Total in 24Hrs RO Water & Well and Finish Product				52,008			28,004	80,012	0						
K.D.A WATER LINE METER READING															
TIME	PREVIOUS READING	CURRENT READING	Difference	TOTAL CAPACITY IN GALLONS											
9:00	238788	238788	0	-	4" dia KDA Meter Reading										
	33008	33094	86	22,704.00	3" dia KDA Meter Reading										
9:00	97513	97513	0	-	R.O Transfer To Main Tank Meter Reading										
PHYSIOTHERAPY WATER LINE METER READING															
TIME	PREVIOUS READING	CURRENT READING	Difference	TOTAL CAPACITY IN GALLONS											
9:00	5916	5916	0	-											
23:45															
TIME	PREVIOUS READING	CURRENT READING	Difference	TOTAL CAPACITY IN GALLONS											
9:00	230567.56	230630.2	62.64	16,536.96											
9:00	247228.99	247321.59	92.6	24,446.40											
9:00	131321.41	131392.16	70.75	18,678.00											
TIME	Date	WATER TANKER #	SLIP #	Cap. Gallons	ORDER BY INCHARGE & C.#	Plumber Name	Security	FRONT OFFICE	AUDITOR	Remarks					
Total RO Finish Product				52,008											
Total KDA Main Water Line Water				22,704											
Tanker Water Received				-											
Over all Water Generation				74,712											
					Storage Facilities										
					Under Ground Tank 28000										
					Finish RO Tank 35000										
					Overah Tank 8000										
					Hot Water 5500										
					76,500.0										
Total Supply to Hospital				59,661	New 02 Nos Meter installed for supply of Hospital Supply										
Dialysis Plant & Lab Supply				16,246	10560	After Treated up to 20 TDS Uses in Dialysis Equipment (including re-									
Ro Plant Service/Flusing washing				3,000											
student Hostel (unmetered)				5,500											
Total Water Consumption				84,408	Main Tank	16,363									
Water in Hand R.O & Main Under Ground Tank				53,213	R.O Tank	36,850									

Example of R.O Plant Recycle, Total Conservation Capacity & Consumption of treated water in Ziauddin University North Campus

- Free Water Distribution**

Ziauddin University has placed water filters in the university for free distribution of drinking water for the students, staff, faculty and general public (visitors/ guests). The purpose of this free distribution of drinking filter water is to reduce the use of plastic bottles from the university and promote the culture to bring your own bottles and refill whenever needed. In this way not only the plastic bottles have reduced but waste of water has also been minimal.



• Water pollution Control

Ziauddin University not only focused on a clean and green environment but also aimed to produce clean water for the consumer and surrounding communities. The Maintenance Department has installed a proper system for water quality check and pollution control in the entire Ziauddin University and Hospital. There are three shifts of staff in morning, evening and night to assess water level, TDS level and maintenance of water plants. The sources of water at Dr. Ziauddin Group are Main water tanks, R.O Plants, KDA line water, R.O raw water. The staff has to check the level of water every hour in his shift.

The maintenance head ensures the maintenance of machines/ equipment are done regularly as per the defined schedule. Daily inspection and cleaning of pumps, pump motors, electric panel, electric wires and motor coupling etc., are done by the maintenance team and daily analysis progress report is signed by the maintenance manager. Weekly progress reports are also generated to check leakage, water level, safety valve, pressure switch, pressure gauge, gauge glass and cleaning and servicing of the boilers. All these regular weekly and monthly processes are done at Ziauddin hospital to ensure that all the machinery/ equipment used in water distribution and consumption are in good condition and have proper maintenance to minimize the chances of breakdowns during operations.

Ziauddin University follows the proper mechanism to ensure the water quality of the campus water system. Dr. Ziauddin hospital has its own clinical Laboratory for microbiology tests which is ISO certified. Ziauddin Group practices monthly water cultural tests of all water sources and all their locations to ensure that the water is bacteria free, non-polluted and satisfactory for human and environment consumption.

Daily Report of Water Tank Level						
Date: 26/9/22						
Time	Feet	Inch	Main Tank TDS	Plumber	Hospital	
					A.Shaikh	Location
09:00AM	4	11	460	OK	9 AM TO 9 AM	Gate 6 1/2
10:00AM	4	10	460	OK	14000	Gate 5 1/2
11:00AM	4	9	460	OK	13000	Plot 1/2
12:00PM	4	8	460	OK	7000	D20
01:00PM	4	7	460	OK	4500	D24
02:00PM	4	6	460	OK	3000	Pharmacy
03:00PM	4	5	460	OK	15000	1
04:00PM	4	5	460	OK	Total-GL	15000
05:00PM	4	5	460	OK		Hostel 1
06:00PM	4	6	460	OK		Hospital 2 + 1/2
07:00PM	4	5	460	OK	A.Ahmed	
08:00PM	4	4	460	OK	9 AM TO 9 AM	
09:00PM	4	3	460	OK	11000	
10:00PM	4	2	460	OK	13000	
11:00PM	4	1	460	OK	14000	
12:00AM	4	1	460	OK	6000	
01:00AM	3	11	460	OK	7000	2
02:00AM	3	10	460	OK	3000	(81)
03:00AM	3	9	460	OK	2500	
04:00AM	3	8	460	OK	Total-GL	14000
05:00AM	3	7	460	OK	NLC	
06:00AM	3	6	460	OK	9 AM TO 9 AM	
07:00AM	3	5	460	OK	10000	
08:00AM	3	4	460	OK	8000	
					7000	2 (106)
					Total	14000

Supervisor Maintenance: *[Signature]*

Example of Daily Dialysis Progress Report at Clifton Site



W.W.I **W A T E R W O R L D**
 International
 ACKNOWLEDGE DATE: 21-10-2023
 REPORTING DATE: 20-10-2023
 TIME: _____

OLD R.O PLANT DAILY PROGRESS REPORT

CHECK LIST	OBSERVATION	TDS
PREVIOUS READING	3128	
CURRENT READING	3128	
TOTAL CAPACITY IN LITERS (M3)		
TOTAL CAPACITY IN GAILON	R.O out of order.	-

NEW R.O # 2 PLANT DAILY PROGRESS REPORT

CHECK LIST	OBSERVATION	TDS
PREVIOUS READING	67936	
CURRENT READING	68007	
TOTAL CAPACITY IN LITERS (M3)	71	
TOTAL CAPACITY IN GAILON	18744	560

NEW R.O # 3 PLANT DAILY PROGRESS REPORT

CHECK LIST	OBSERVATION	TDS
PREVIOUS READING	98195	
CURRENT READING	98261	
TOTAL CAPACITY IN LITERS (M3)	66	
TOTAL CAPACITY IN GAILON	17424	540

NEW R.O # 4 PLANT DAILY PROGRESS REPORT

CHECK LIST	OBSERVATION	TDS
PREVIOUS READING	33906	
CURRENT READING	33984	
TOTAL CAPACITY IN LITERS (M3)	78	
TOTAL CAPACITY IN GAILON	20592	535
TOTAL CAPACITY IN GAILON NEW & OLD	56760	
R.O WATER TRANSFER TO MAIN TANK	Meter out of order.	

W.W.I OPERATOR

 DY MANAGER / SR. MANAGER

 G.M ADMIN

R.O MANAGER

 GROUP DIRECTOR P&D

 DEPUTY MEDICAL DIRECTOR
 PREPARED BY M.KHALID MEHMOOD

Example of Daily Dialysis Progress Report at North Site



DR. ZIAUDDIN HOSPITAL CLINICAL LABORATORY

(Participating in College of American Pathologists Proficiency Testing)



Name: C/O Dr. Ziauddin Hospital	Ref. Phy:	Lab No: 100423230722
ZH:	Sample Recvd: 15/07/2022	Dept No: 14/2022
OPD/Comp:	OPD:	Card No:
Test Req: QUALITY CONTROL	Source: Water RO-01	Location: Clifton

QUALITY CONTROL / MICROBIOLOGY

Specimen data:

C/O Dr. Ziauddin Hospital Clifton Campus.
One Blue top sterile container was received marked as water RO-01.

Culture: (Final Report):

Total Bacterial Colony Count	: 00 cfu/ml
Total Coliform Organism	: 00 cfu/100 ml
Fecal <i>E.coli</i>	: Not Isolated
Fecal <i>Streptococci/Enterococci</i>	: Not Isolated
<i>Pseudomonas aeruginosa</i>	: Not Isolated

Remarks:

The sample submitted is bacteriologically satisfactory and fit for human consumption.
The above result cannot be used for advertising purpose.

Recommended value for drinking water

Organism	Recommended value
Total Bacterial Colony Count	: Less than 500/ml
Total Coliform Organism	: 00/100 ml
Fecal <i>E.coli</i>	: 00/100 ml
Fecal <i>Streptococci/Enterococci</i>	: 00/100 ml

Presence of *E.coli*, Fecal *Streptococci* and *Enterococci* is suggestive of fecal Contamination.

Technologist:

Prepared By: HM Ver 2.0

Clinical Microbiologist: - Dr. Faisal Iqbal Afridi (Ext: 206)

M.B.B.S, FCPS (Clinical Microbiology)

Pathologist:

Date of Print: 22/07/2022

20-364

NORTH NAZIMABAD CAMPUS
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CLIFTON CAMPUS
4/B, Shahr-e-Ghalib, Block-E, Clifton, Karachi-75600.
Tel: 35852937-39 Fax: (9221) 35837212

NAZIMABAD CAMPUS
Plot No. 5, Block-3, Nazimabad, Karachi-18.
Tel: 36811873, 36880912

KEAMARI CAMPUS
Plot No. 33, Behind KPT Hospital, Keamari.
Tel: 32851881-5 Fax: (9221) 32851

Block-B, North Nazimabad, Karachi-74700.

4/B, Shahr-e-Ghalib, Block-E, Clifton, Karachi-75600.
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Example of Water Cultural Test Report to check water quality at Clifton Site



DR. ZIAUDDIN HOSPITAL CLINICAL LABORATORY

(Participating in College of American Pathologists Proficiency Testing)



Name: C/O Infection Control	Ref. Phy:	Lab No: 219482
ZH	Sample Recvd: 09/08/2023	Dept No: 38/2023
OPD/Comp:	OPD	Card No:
Test Req: QUALITY CONTROL	Source: RO Mixing tank water	Location: Main

QUALITY CONTROL / MICROBIOLOGY

Specimen data:

C/O Infection Control Dr. Ziauddin Hospital North Campus.
One Red top sterile container was received marked as RO Mixing tank water.

Culture:

(Final Report):

Total Bacterial Colony Count	:	00 cfu/ml
Total Coliform Organism	:	00 cfu/100 ml
Fecal <i>E.coli</i>	:	Not Isolated
Fecal <i>Streptococci/Enterococci</i>	:	Not Isolated
<i>Pseudomonas aeruginosa</i>	:	Not Isolated

Remarks:

The sample submitted is bacteriologically satisfactory and fit for human consumption.
The above result cannot be used for advertising purpose.

Recommended value for drinking water

<u>Organism</u>	<u>Recommended value</u>
Total Bacterial Colony Count	: Less than 500/ml
Total Coliform Organism	: 00/100 ml
Fecal <i>E.coli</i>	: 00/100 ml
Fecal <i>Streptococci/Enterococci</i>	: 00/100 ml

Presence of *E.coli*, Fecal *Streptococci* and *Enterococci* is suggestive of fecal Contamination.

Technologist:

Prepared By: HM Ver.2.0.

Clinical Microbiologist: - Dr. Faisal Iqbal Afridi (Ext: 206)
M.B.B.S, FCPS (Clinical Microbiology)

Pathologist:

Date of Print: 16/08/2023

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Plot No. 33, Bahawal RPT Hospital, Keamari, Kara.
Tel: 32851881-5 Fax: (9221) 32851031

Example of Water Cultural Test Report to check water quality at North Site

Example of water pollution Control at Ziauddin University



• **Waste Water Treatment Mechanism**

Dr. Ziauddin Group took an initiative to recycle sewage water with the project name **Waste Water Treatment** in contract with the private firm Water World International to providing their service on contract basis. Waste Water Treatment Plant was established at Ziauddin University Clifton Family Park extension. This Sewage Treatment Plant is a complete system that ensures purification of dirty water before it is disposed off in the environment. In Ziauddin University more than 70% of sewage water is purified through water recycling process and the treated water then used for forest plantation and for gardening.

How does it work?

1. Collection

To begin with, the Wastewater Treatment system first collects effluents from sewerage pumping station in huge tanks and then sent further down the line for treatment.

2. Screening

Using pre-installed screening systems, the plant than physically screens out the bigger particles like metal and cloth pieces, plastic and glass, anything that is visible to the naked eye.

3. Flocculation and Coagulation

Once the bigger particles are removed, next the system works on tinnier particles. The flocculation process includes combining the destabilized particles so that they separate from the water. Coagulants are than added that makes heavier particles settle down and filter out without any further addition of chemicals.

4. Neutralization and Disinfection

Different chemicals are added in water (especially chlorine) to help maintain the pH of the water and kill bacteria which makes it good enough for consumption and usage.

5. Storage and Distribution

Once the water is free from all sorts of toxins and chemicals, it is collected in a tank and distributed farther to serve various purposes. In most cases, the industries that use such systems of wastewater recycling utilize the water themselves for completion of process rather than going for freshwater supply.

Benefits of Wastewater Treatment Plant

Here are a few benefits of wastewater treatment system:

- Helps industries in cutting down costs of fresh water acquisition
- Reduces water pollution and saves the environment
- The plant filters water, making it worthy for agriculture field & for gardening

Reduces waste from industries that is destroying the planet .



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Example of Waste water/ Sewage disposal Treatment at Ziauddin University