A

On Job Training Report

On

AquaN Water industry

Completed at

AquaN NB Industry

Address: Gat no. 170, college road , at post taluka chandgad , Dist. Kolhapur

By

Miss. Vedika Sudhir Bhosale

M.sc Microbiology

Part I Semester II

PG Department of Microbiology Vivekanand College

(An Empowered Autonomous Institute)

Kolhapur, 416003

Maharashtra, India

2025-2026

Dissemination of Education for Knowledge, Science and Culture"-
Shikshanmaharshi Dr.Bapuji
Salunkhe Shri Swami Vivekanand Shikshan Sanstha's

स्वायत्त) कोल्हापूर

VIVEKANAND COLLEGE, KOLHAPUR
(AN EMPOWERED AUTONOMOUS INSTITUTE]
PG Department microbiology

CERTIFICATE OF
"ON JOB TRAINING"

This is to certify that Miss. Vedika s. Bhosale has satisfactorily carried out the required practical work prescribed by the Department of Microbiology, Vivekanand College, Kolhapur (An Empowered Autonomous Institute) for M.Sc. - Part- I Semester II course in On Job Training [Sub code-0JT20MIC21] and this report represents her Bonafide work in the year 2025 – 2026

Place: kolhapur

Date: 5/1/26

Examiner

OJT In charge

Head
I/C Head
Department of Microbiology
Vivekanand College, Kolhapur
(Empowered Autonomous)

DECLARATION

I hereby declare that I have successfully completed the On Job Training program at AquaN NB Industry. I acknowledge that skills acquired during this training program are valuable to me and will contribute to my professional development.

I express my gratitude to supervisor sapna mam, Shivraj Sir (Owner of NB Indutries), AquaN NB Industries and the whole training team for their support and guidance throughout the training.

Date: 5|1|26

Place: Kolhapur

Miss. Vedika S. Bhosale

ACKNOWLEDGEMENT

At the completion of our project, we take this opportunity to express our sincere gratitude to all those who supported and guided us during our industrial training and helped us turn our efforts into a successful project.

We are extremely thankful to Dr. S. D. Mali mam, Assistant Professor, PG Department of Microbiology, Vivekanand College, Kolhapur (An Empowered Autonomous Institute), project guide for her valuable guidance and mentorship throughout this project work given to us during the study.

We are indeed grateful to Head Dr. T. C. Gaupale sir , Coordinator Ms. V. V. Misal mam , PG Department of Microbiology, Vivekanand College, Kolhapur (An Empowered Autonomous Institute) for their kind co-operation and valuable support and we are also thankful to all the staff members of our department for their direct and indirect support.

We are thankful to Principal Dr. S.P Thorat , for his kind co-operation and valuable support.

Also, we sincerely thank our parents for helping us in all aspects to complete the project work. Finally, we would like to appreciate our friends, colleagues for their direct and indirect contribution.

Date: 5/1/26
Place: Kolhapur

Miss. Vedika Sudhir Bhosale

Jr. College Recog.No. H.S.C / 1074/R-1/DT. 8-8-1976
Jr. College Code No. 23-09-002
Jr. College U.Dise No. 27341301006

"ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार"
-शिक्षणमहर्षी डॉ. बापूजी साळुंखे

ESTD June 1964
AISHE Code : C-11042
DTE Code : 16124

Shri Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE, KOLHAPUR
(AN EMPOWERED AUTONOMOUS INSTITUTE)
2130, 'E' Tarabai Park, Kolhapur, Tal. Karveer, Dist. Kolhapur - 416003
Affiliated to Shivaji University, Kolhapur (M.S.)
NAAC Reaccredited : "A+" (CGPA3.29)
College with Potential for Excellence by U.G.C., New Delhi
"Star College" by D.B.T Govt. of India
ISO 9001 : 2015

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Founder: Dr. Bapuji Salunkhe D.Lit.
President: Hon. Chandrakant Dada Patil M.L.A
Chairman: Prin. Abhaykumar Salunkhe M.A
Secretary: Prin.Mrs. Shubhangi Gawade M.Sc. B.Ed.
Inch. Principal: Dr. S. P. Thorat M.Sc. M.Phil. Ph.D.

Ref. No. VCK/2109/2025-26

Date : 13/12/2025

To,
The Managing Director,
AquaN
NB Industries Chandgad,
Kolhapur.

Subject: - Regarding permission to carry out On Job training in your esteemed industry .

Respected Sir/Madam,

Our students of M.Sc. part I Microbiology are interested to carry out On Job training as a part of their curriculum during the period of 16th December to 31st December 2025.So kindly grant the permission and guide them for their training work. Name of the students attending training are as follows-

Sr. No.	Name of students	Roll No.
1.	Vedika .S. Bhosale	5401

Thanking you,

M/S N. B. INDUSTRIES CHANDGAD

N.B. INDUSTRIES
Proprietor

Yours faithfully
Dr. S. P. Thorat
I/c Principal
Vivekanand College, Kolhapur
(An Empowered Autonomous Institute)

Internship Undertaking

1. Student Name:	Vedika Sudhir Bhosale.		
2. Current Address	More Mane Nagar, Kolhapur.		
3. Residence Address	Plot no - 139 More Mane Nagar near Sabkhenagar, Kolhapur.		
4. Email id	Vedikabhosale1111@gmail.com.		
5. Mobile Nos.	7620776797		
6. Aadhar	5061 4446 6999.		
7. PAN	GSMPB3608D.		
8. Overall GPA	–		
9. Mode of Internship	offline.		
10. Internship Preferences	–		
	Location	Core Area	Organization / Institute
Preference-1	chandgad	chandgad	AquaNB industries
Preference-2	–	–	–
Preference-3	–	–	–

I confirm that I agree with the terms, conditions, and requirements of the Internship Policy

Student Signature: Vedika

Date 5/10/25

I confirm that the student has attended the internship orientation and has met all paperwork and process requirements to participate in the internship program, and has received approval from his/her mentor.

Shmali

Sign of Department Faculty Coordinator

Date 27/3/26.

Student Diary (Log) Recording Format

Week	Task Assigned	Activities Performed	Key Learnings	Additional Remarks
16/12/25 to 20/12/25	Water Sample analysis	Collected water sample and performed microbial testing	Learned water sampling and basic Microbiological analysis.	Work done under supervision
22/12/25 to 26/12/25	Media Preparation and testing.	Prepared culture media and inoculated water sample & performed	Learned media Preparation & Microbial growth observation	Lab work completed.
27/12/25 to 31/12/25	Routine Microbido-gical testing	performed streaking, Gram staining & recorded results.	Learned bacterial Isolation & identification.	Routine analysis completed.

Signature of Industry Supervisor

Attendance Sheet

Name & Address of Organization

AquaN NB Industries.
Gat no-170, college Road, Atpost
& Taluka-chandgad Dist-Kolhapur.

Name of the Student	Vedika sudhir Bhosale.
Roll Number	5402
Name of Course	MSc-I (Microbiology).
Date of Commencement of Training	16/12/25
Date of Completion of Training	31/12/25

Month and Year:

Day	Date	Sign of student
1	16/12/25	
2	17/12/25	
3	18/12/25	
4	19/12/25	
5	20/12/25	
6	22/12/25	
7	23/12/25	
8	24/12/25	convocation Holiday
9	25/12/25	
10	26/12/25	
11	27/12/25	
12	29/12/25	
13	30/12/25	
14	31/12/25	
15		

- Attendance Sheet should remain affixed in Daily Training Diary. Do not remove or tear it off.
- Holidays should be marked in Red Ink in attendance column. Absent should be marked as A 'in Red Ink.

Name and Signature with date of Internship Supervisor 31-12-2025

M/S N. B. INDUSTRIES CHANDGAD

Is self-reliant			✓	
Communicates well				✓
Writes effectively			✓	
Has a professional attitude		✓		
Gives a professional appearance				✓
Is punctual			✓	
Uses time effectively			✓	

Overall performance of student intern (circle one):

(Needs improvement / Satisfactory / **Good** / Excellent)

Additional comments, if any: overall experience is very good. I had learned new techniques.

M/S N. B. INDUSTRIES CHANDIGARH

Signature of Industry supervisor Sharolaucelers

HR Manager Sapna mam.

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Student Feedback of Internship

(To be filled by Students after Internship completion)

Student Name: Vedika Sudhir Bhosale Date: 17/3/2026.

Address: Kolhapur

Give a brief description of your internship work (title and tasks for which you were responsible):

Was your internship experience related to your major area of study?

- ✓ Yes, to a large degree
- Yes, to a slight degree
- No, not related at all

Indicate the degree to which you agree or disagree with the following statements.

This experience has:	Strongly Agree	Agree	No opinion	Disagree	Strongly Disagree
Given me the opportunity to explore a career field	✓				
Allowed me to apply classroom theory to practice		✓			
Helped me develop my decision-making and problem-solving skills	✓				
Expanded my knowledge about the work world prior to permanent employment	✓				
Helped me develop my written and oral communication skills	✓				
Provided a chance to use leadership skills (influence others, develop ideas with others, stimulate decision-making and action)	✓				

Expanded my sensitivity to the ethical implications of the work involved	✓				
Made it possible for me to be more confident in new situations		✓			
Given me a chance to improve my interpersonal skills		✓			
Helped me learn to handle responsibility and use my time wisely	✓				
Helped me discover new aspects of myself that I didn't know existed before	✓				
Helped me develop new interests and abilities	✓				
Helped me clarify my career goals		✓			
Provided me with contacts which may lead to future employment		✓			
Allowed me to acquire information and/ or use equipment not available at my Institute	✓				

- In the Institute internship program, faculty members are expected to be mentors for students. Do you feel that your faculty coordinator served such a function? Why or why not?

Yes, the faculty coordinator guidedand supported me throughout the internship.

- How well were you able to accomplish the initial goals, tasks and new skills that were set down in your learning contract? In what ways were you able to take a new direction or expand beyond your contract? Why were some goals not accomplished adequately?

I was able to achieve most of the goals and learned several new practical skills.

- In what areas did you most develop and improve?

I improved my laboratory techniques, communication, and practical knowledge.

- What has been the most significant accomplishment or satisfying moment of your internship?

successfully performing laboratory experiments independently.

- What did you dislike about the internship?

Limited time to explore more advanced techniques.

- Considering your overall experience, how would you rate this internship? (Circle one).

-Satisfactory/ Good/ Excellent

Excellent.

- Give suggestions as to how your internship experience could have been improved. (Could you have handled added responsibility? Would you have liked more discussions with your professor concerning your internship? Was closer supervision needed? Was more of an orientation required?)

More hands-on training and longer internship duration would improve the experience.

Signature of Student:

Name: Vedika S. Bhosale

Roll number:

Date:

NB INDUSTRIES

MFG: PACKAGED DRINKING WATER

AquaN
FRESHEN UP YOUR MIND

IS 14543
CM/L 7500031106

Date:-31-12-2025

This is to clarify that Miss.Vedika Sudhir Bhosale, a student of Vivekananda College Kolhapur,

Pursing her Master's in Microbiology, has completed her 160 hours of on Job training in **AquaN (N.B INDUSTRIES)** between 16 December 2025 to 31 December 2025.

During this period, Miss.Vedika Sudhir Bhosale displayed sincerity, politeness and dedication towards his assigned tasks.

We appreciate her performance and wish her great success ahead.

Authorized signatory

M/S N. B. INDUSTRIES CHANDGAD

Factory : Gat No. 170, M. No. 1998,College Road, At Post & Tal - Chandgad, Dist - Kolhapur, Maharashtra 416 509
Email : nbwaterindustries@gmail.com ● Website : nbwaterindustries.com
Tel. 02320 -224650 Mob.: 9920116621 | 9833413035

AquaN NB INDUSTRIES

Introduction :

It is a water plant designed to remove physical, chemical, and biological contaminants from raw water and make it safe for human consumption and other purposes.

The treatment process generally includes several stages such a screening, sedimentation, coagulation, filtration, and disinfection.

2] Air Compressor unit

The air compressor supplies clean compressed air for operating pneumatic valves, automation, and cleaning activities in the water purifier (RO) plant.

Working Principle:

Air is sucked from atmosphere
I t is compressed inside cylinder/screw
Pressure increases
Stored in air receiver tank
Supplied to plant equipment when needed

Stages of water purifier

· **Feed / Multistage Pump Purpose**: Pushes water through filters and RO membranes.

· **Sand Filter (Pre Filtration)**Removes : Mud Dust Suspended particles.
Benefit: Protects finer filters and RO membranes

· **Carbon Filter**
Removes : Chlorine Bad smell Organic impurities
Importance: Chlorine can damage RO membranes, so this step is critical.

· **Micron Cartridge Filters** (5 µm / 1 µm)
Removes: Very fine particles
Role: Final protection before RO Improves membrane life and efficiency

· **Reverse Osmosis :** Dissolved salts (TDS) Heavy metals Bacteria & viruses

Ozone Generator (Disinfection)
Purpose: Kills bacteria, viruses, microorganisms Ozone is mixed with RO water
Advantage :No chemical residue Improves shelf life of stored water

UV / Post-Treatment : Extra safety disinfection step Ensures 100% microbial safety

Product Water Storage Tank Stores purified water safely Usually stainless steel to prevent contamination Water is now ready for drinking, bottling, or industrial use

Report of daily unit testing

FORM NO.2

N.B.INDUSTRIES

REPORT FOR DAILY/EACH CONTROL UNIT TESTING

Date of Production	Batch No Control unit No.	Description	Colour	Odour	Taste	Turbidity	TDS	Chloride	Sulphate	Alkalinity	Residual Free Chlorine	E.coli	Coliform Bacteria	Sulphite Reducing anaerobes	Pseudomonas aeruginosa	Aerobic Microbial count		Yeast & Mould	Remark
																20-22°C	37°C		
13/11/23	K05	Clear	K0.5Hz	Agree-able	Agree-able	0.0NTU	18	1.9mg/l	ND	1.1mg/l	Nil	Absent	Absent	Absent	Absent	5cfu/ml	2cfu/ml	Absent	pass
17/11/23	K06	Clear	K0.5Hz	Agree-able	Agree-able	0.0NTU	19	1.9mg/l	ND	1.2mg/l	Nil	Absent	Absent	Absent	Absent	4cfu/ml	1cfu/ml	Absent	Pass
21/11/23	K07	Clear	K0.5Hz	Agree-able	Agree-able	0.0NTU	17	1.8mg/l	ND	3.2mg/l.	Nil	Absent	Absent	Absent	Absent	3cfu/ml	2cfu/ml	Absent	Pass
24/11/23	K08	Clear	K0.5Hz	Agree-able	Agree-able	0.0NTU	18	1.9mg/l	ND	2.3mg/l	Nil	Absent	Absent	Absent	Absent	5cfu/ml	1cfu/ml	Absent	pass
28/11/23	K09	Clear	K0.5Hz	Agree-able	Agree-able (a)	0.0NTU	18	1.9mg/l	ND	3.1mg/l	Nil	Absent	Absent	Absent	Absent	5cfu/ml	2cfu/ml	Absent	Pass
01/12/23	L01	Clear	K0.5Hz	Agree-able	Agree-able (a)	0.0NTU	19	1.8mg/l	ND	1.2mg/l	Nil	Absent	Absent	Absent	Absent	5cfu/ml	3cfu/ml	Absent	Pass
05/12/23	L02	Clear	K0.5Hz	Agree-able	Agree-able (a)	0.0NTU	19	1.9mg/l	ND	2.1mg/l	Nil	Absent	Absent	Absent	Absent	4cfu/ml	2cfu/ml	Absent	Pass
26/12/23	L03	Clear	K0.5Hz	Agree-able	Agree-able(a)	0.0NTU	16	1.8mg/l	ND	1.2mg/l	Nil	Absent	Absent	Absent	Absent	4cfu/ml	1 cfu/ml	Absent	Pass
02/01/24	A01	Clear	K0.5Hz	Agree-able	Agree-able(a)	0.0NTU	17	1.9mg/l.	ND.	3.1mg/l.	Nil	Absent	Absent	Absent	Absent	4cfu/ml	2cfu/ml	Absent	Pass
05/01/24	A02	Clear	K0.5Hz	Agree-able	Agree-able(a)	0.0NTU	18	1.9mg/l	ND	2.4mg/l	Nil	Absent	Absent	Absent	Absent	4cfu/ml	1 cfu/ml	Absent	Pass
19/01/24	A03	Clear	K0.5Hz	Agree-able	Agree-able(a)	0.0NTU	18	1.8mg/l	ND	2.0mg/l	Nil	Absent	Absent	Absent	Absent	3cfu/ml	2cfu/ml	Absent	pass
21/01/24	A04	Clear	K0.5Hz	Agree able	Agree able(a)	0.0NTU	19	1.9mg/l	ND.	2.4mg/l.	Nil	Absent	Absent	Absent	Absent	4cfu/ml	2cfu/ml	Absent	Pass

. This is a Daily Water Quality / Control Unit Testing Report. It records routine physical, chemical, and microbiological tests of water samples to ensure safety and quality.

- Physical tests: colour, odour, taste, turbidity, TDS .
- Chemical tests: pH, sulphate, alkalinity, residual chlorine .
- Microbiological tests: *E.coli*, coliforms, aerobic/anaerobic bacteria, yeast & mould
- Result: Most entries show "Absent / Nil" for harmful microbes and values within limits, so samples are marked PASS.
- Purpose: To confirm that supplied water is safe for drinking/use on a daily basis.

- working in a microbiology laboratory and performing sample analysis under sterile conditions using laboratory equipment (like incubator/oven or testing unit) to check microbial contamination in samples [water]

• Process of laboratory testing

- 1. Sample Handling & Aseptic technique : Samples are labeled and handled as per standard operating procedures (SOPs)2.
- 2. Sample Processing : Samples are measured or diluted properly Inoculation is done on culture media (agar plates or broth)Media supports growth of microorganisms if present
- 3. Incubation : Plates/tubes are kept inside incubators or testing units Controlled temperature (e.g., 20–22°C or 37°C) and time are maintained Allows bacteria, yeast, or mold to grow
- 4. Microbial Testing: Total bacterial count Coliforms & *E. coli* Yeast and mould Aerobic / anaerobic bacteria.
- 5. Observation & Results After incubation, she observes colonies Counts colonies or notes presence/absence
- 6. Results are recorded in daily microbiology test reports

Instruments for water testing

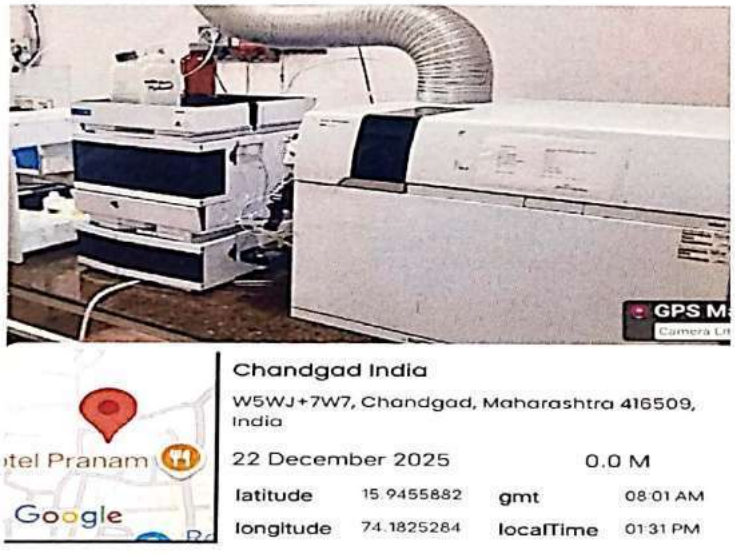
1] HPLC System

- Introduction:

  water analysis laboratory equipped with (ppm–ppb level).

- principle:

  HPLC works on the principle of separation of components based on their differential interaction between a stationary phase and a mobile phase under high pressure. advanced chromatographic instruments used to detect chemical contaminants in water at very low concentrations



• UV–Visible Spectrophotometer (Water Testing)

- A spectrophotometer is an analytical instrument used to measure the amount of light absorbed by a solution at a specific wavelength. In water testing, it is mainly used to quantify chemical parameters based on color intensity.

- Uses of spectrophotometer :

  1] drinking water quality monitoring

  2] wastewater and effluent testing.

  3] quality control in water treatment plants

PH Meter

Digital **PH Meter** in a laboratory setting. It is a precise instrument used to measure the acidity

1] The Glass Electrode: This has a special membrane made of lithium-doped glass. When dipped into a liquid, hydrogen ions (H^+) exchange with the metal ions on the surface of the glass, creating a tiny electrical potential.
2] The Reference Electrode: This stays at a constant, stable voltage . The Measurement: The meter measures the difference in voltage between these two. Every change of 1 pH unit typically corresponds to a change of about 59 millivolts at room temperature (25°C).

• Laminar airflow

1. Laminar Air Flow cabinet is a laboratory equipment that provides sterile air flow through HEPA filters to prevent contamination during microbiological work

2. Principle : It works on the principle of laminar air flow, where filtered air moves in a uniform direction at a constant speed.Air passes through a HEPA filter (High Efficiency Particulate Air filter) which removes 99.97% of particles, bacteria, and dust.

- # Digital Nephelometer

A **Digital Nephelometer** is a laboratory instrument used to measure turbidity (cloudiness) of water. Turbidity occurs when suspended particles like microorganisms, clay, or organic matter scatter light in the water.

It works on the Nephelometry principle, which measures the intensity of light scattered by particles in a liquid sample.

Use in water testing :
Detect suspended particles in drinking water.
Check water quality in environmental and microbiology labs.
Used in water treatment plants to monitor purification.

0–5 NTU → Good / clear water
High NTU → Water contains many suspended particles (turbid)

• water purification test

1] multiple Tube Fermentation

Material used :

1] Test tubes with lactose broth
2] Durham
3] tubes Incubator

Purpose Estimate the Most Probable Number (MPN) of coliform bacteria in water.

Procedure:

1. Water sample is inoculated into lactose broth tubes.
2. Tubes are incubated at 37°C.
3. Gas formation in Durham tube indicates coliform presence
4. MPN value is calculated using statistical tables.

3] coliform test

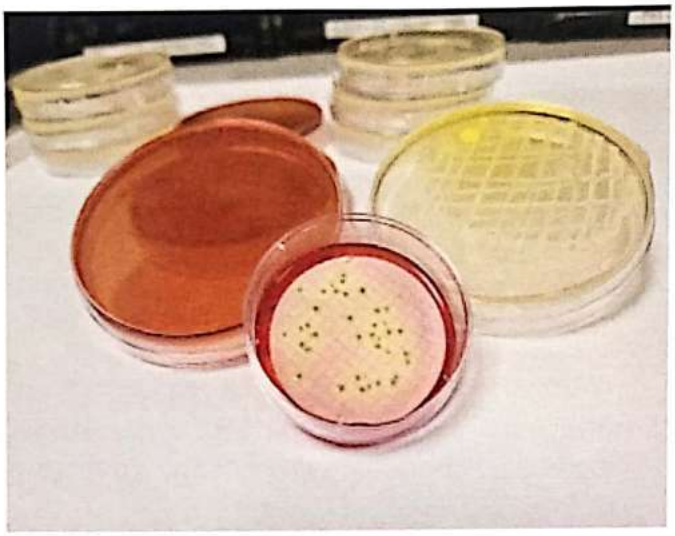


Fig : before disinfectant bacterial colonies appeared on the membrane

To allow microorganisms present in the water sample to grow under controlled temperature so that bacterial colonies can be observed.

After incubation, visible bacterial colonies appeared on the agar plates. To make water safe for drinking testing is done as further

- If coliform bacteria are detected, the water is consider microbiologically unsafe then the water under goes chlorination and re-testing.

- 1.Chlorination (Disinfection): Chlorine is added to the water to kill bacteria and pathogens. This is the most common method used in water plants.

- 2. Re-testing of Water: After treatment, the water sample is tested again for coliform bacteria to confirm that contamination has been removed.

- 3. Source Inspection: The water source (well) is checked to identify where contamination occurred.

- 4. Cleaning and Maintenance : Water tanks, pipes, and filters are cleaned and disinfected to prevent further contamination.

Fig . After re-testing of water sample, Less number of coliform bacteria was observed

After the initial test, coliform bacteria were detected in the water sample, indicating contamination. The water was then treated with proper disinfection (chlorination) in the water treatment plant.

After incubation, very few or no coliform colonies were observed on the agar plate.

The reduced number or absence of coliform bacteria indicates that the treatment was effective. **Therefore, the water is considered microbiologically safe and suitable for drinking according to water quality standards.**

2] Incubation of microbial cultures

To allow microorganisms present in the water sample to grow under controlled temperature so that bacterial colonies can be observed.

First, I prepared the culture plates containing agar medium and inoculated them with the water sample under sterile conditions. Then I placed the Petri plates inside the bacteriological incubator and set the temperature at 37°C. The plates were incubated for 24 hours to allow microbial growth.

Observation :

After incubation, visible bacterial colonies appeared on the agar plates.

1. Chemical Oxygen Demand [COD]

COD measures the total amount of oxygen required to chemically oxidize organic and inorganic matter present in water. Organic pollutants in water are oxidized by a strong chemical oxidizing agent (usually potassium dichromate in acidic medium). The amount of oxygen required for this oxidation is measured as COD.

2.Biochemical Oxygen Demand [BOD]

BOD measures the amount of oxygen required by microorganisms to decompose organic matter in water.

Microorganisms consume dissolved oxygen while degrading organic substances. The difference in dissolved oxygen (DO) before and after incubation gives the BOD value.

PSEUDOMONAS AERUGINOSA

Take dry & sterile membrane filtration assembly & sterile APB plate

Clean all area of working place with using U.V light

Take MFA & out 0.45 micron filter paper with sterile forecep on the surface with of assembly

Pass out 250ml of sample (product water)

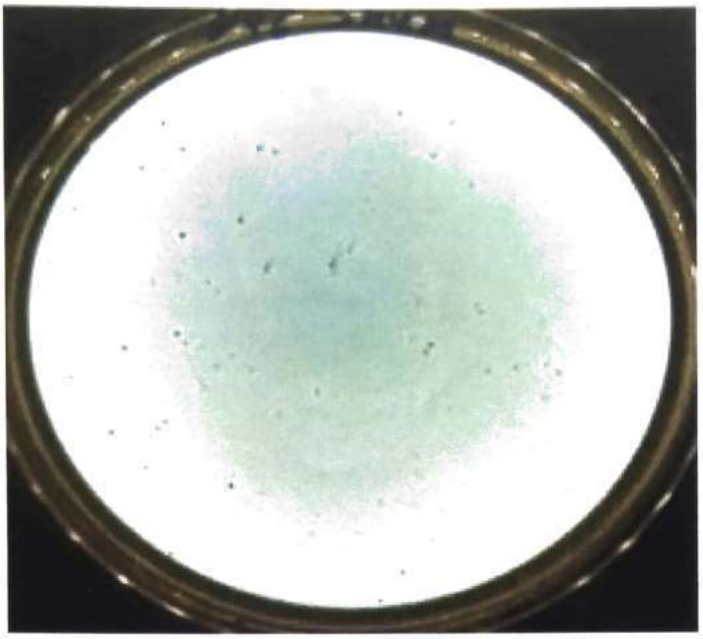
Start vacuum pump for filtration fastly

Add 1.25 ml ethyl alcohol in APB broth

After filtration take that paper & place on sterile APB agar plate avoiding air bubbles

Keep at 37°C for 2 days

Positive Result- Broth become turbid [greenish]
Confirmation test- Milk agar technique Keep at 37°C 2 days
Positive result - Bluish green colored colonies



In the above fig, the agar remains transparent and clear. There is no "turbid" or "greenish" appearance in the surrounding medium.

Filter Paper: The 0.45-micron filter remains white and clean, with no visible bacterial colonies growing on its surface.

So , the water sample meets the safety standards