

# Evaluation of Ground Water Quality in and Around Thanjavur Using GIS Method

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**Abstract - Water's essential function as drinking water is a significant daily intake. Contamination by microorganisms (bacteria or viruses) on water sources and drinking water supplies is a common cause in developing countries like Indonesia. this paper will discuss the sources of clean water and drinking water and their problems in developing countries; water quality and its reaction to public health problems in these countries ;and what efforts that can make to improve water quality is influenced by natural process and human activities around the water sources among developed countries, public health problems caused by low water quality, such as diarrhea, dysentery, cholera, typhus, skin itching, kidney diseases, hyper tension, heart diseases, cancer, and other diseases the nervous system. Good water quality has a role to play in decreasing the number of diseases suffers or health issues due to drinking and the mortality rate.**

**Keywords:** sanitation, cholera, dysentery, hyper tension, cancer, diseases.

## I.INTRODUCTION

Water quality is measured by several factors, such as the concentration of dissolved oxygen, bacteria levels, the amount of salt(or salinity),or the amount of material suspended in the water (turbidity).in some bodies of water, the concentration of microscopic algae and quantities of pesticides, herbicides, heavy metals, and other contaminates may also be measured to determine water quality.

### 1.1 Physicals properties

**Appearance:** As you are aware now, water is a colorless, odorless, and tasteless liquid in its natural state. The crystal structure of water in hexagonal.

**Boiling Point of Water:** The boiling point is defined as the temperature at which the vapor pressure of the liquid is equal to the pressure surrounding the liquid, and thus the liquid changes to vapor. It is known to us that the boiling point of water is 100°C.

**Freezing Point of Water:** The freezing point is the temperature at which the substance changes state from liquid to solid. So, for water, the point at which liquid state water turns to solid-state ice is the freezing point of water, which is 0°C or 32°F.

**Specific Heat Capacity:** Water has a high specific heat capacity of 4.2 joules per gram at 25°C. This is due to the extensive hydrogen bonding between the water molecules.

**Density of Water:** The density of water is about 1 gm/cc and it varies with temperature in an unusual pattern. The density of water in different states – solid and liquid. In solid-state, the density is 0.9gm/cc.

### 1.2 Chemical Properties

**Amphoteric Nature of Water:** Amphoteric nature is one of the most important properties of water. Amphoteric means the ability of the substance to act as an acid or base. Water in the natural state is neither acidic nor basic. The main reason is its ability to donate and accept protons. However, rainwater is slightly acidic, with a pH between 5.2 and 5.8.

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### Analysis of Samples:

Analysis of the collected ground water samples was done in accordance with the procedures suggested in the Standard Analytical Procedure Manual for water samples which is based on 'Standard Methods for the Examination of Water and Wastewater' 19th edition, APHA, AWWA, wef 1995 (alkalinity-titrimetrically, pH-potentiometrically, HCO<sub>3</sub><sup>-</sup> + CO<sub>3</sub><sup>2-</sup> -calculation from pH and alkalinity, DOIodometrically, BOD- bottle incubation for 5days at 20oC, COD-open reflux, Ca and total hardness-EDTA titrimetric, Mg- calculation from total hardness and Ca, NO<sub>3</sub><sup>-</sup>&PO<sub>4</sub><sup>3-</sup>—spectrophotometric, Cl—argentometric titrimetric, total

dissolved solids- calculation from conductivity). With a pH between 5.2 and 5.8.

Formula of Water: H<sub>2</sub>O is the chemical formula of water consisting of two elements which are hydrogen and oxygen

### 1.3 Biological Properties

Microbial Contamination: Microbial contamination is one of the major concerns of water quality. Many types of microorganisms are naturally present in the water such as,

- Protozoans -Amoeba, cryptosporidium, giardia,
- Bacteria – Salmonella, typhus, cholera, shigella,
- Viruses –Polio, hepatitis A, meningitis, encephalitis,
- Helminths –Guinea worm, hookworm, roundworm.

## II. METHODOLOGY

Sample no	Sample Station	Type of Source	Latitue N	Longitude E
1	Peravurani	Power pump	10.836043	79.12240
2	Pattukottai	Power pump	10.767872	79.16368
3	Orathanadu	Power pump	10.628644	79.25308
4	Thanjavur	Power pump	10.628451	79.32402
5	Papanasam	Power pump	10.92335	79.28637
6	Thiruvaiyaru	Power pump	10.886576	79.11674
7	kumbakonam	Power pump	10.961694	79.38811
8	Thiruvidadaimarudhur	Power pump	10.997235	79.45237

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## III. RESULTS AND DISCUSSIONS

- The pH values for all the samples were almost uniform at all times except for an occasional variation in one or two cases. This may be attributed to the carbonate-bicarbonate buffer abundantly found in the soil.
- Electrical Conductivity (EC) of water is determined by the concentration of ions present in it. The more the concentration of ions in the sample the more is its conductivity.



TAMILNADU WATER SUPPLY AND DRAINAGE BOARD

DISTRICT WATER TESTING LABORATORY

Elizha Nagar Service Reservoir, Near Sarafozi College, Thanjavur-613005.

Phone: 04362-227387

E-mail: awatwadthanjavur@gmail.com



### TEST REPORT

Doc.No: DWTL/FORM/7.8/01

Test Report No: 42154	Report Issue Date : 07/06/2022
Invoice Details: 3949	

Client Name & Address Contact No / Email.ID	: M.Sheik Abdulla Pl. No 50 Karups nagar Near New Bus Stand, Thanjavur
------------------------------------------------	------------------------------------------------------------------------------

Sample Name	: Water
Sample Description	: Infront of House
Sample Submitted by	: Student
Location & Date	: Avanam & 25/05/2022
Quantity of sample Received	: 2L
Sample Container	: Jerry Cane
Sample Condition on Receipt	: Good
Sample Received On	: 01/06/2022
Test Commenced on	: 01/06/2022
Test Completed on	: 07/06/2022
Environmental Condition	: 25.7°C

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012	
					Acceptable Limit	Permissible Limit
1	pH	IS 3025 part 11-1983	--	7.57	6.5-8.5	6.5-8.5
2	Total Alkalinity	IS 3025-part 23-1986	mg/L	520	200	600
3	Total Hardness as CaCO <sub>3</sub>	IS 3025 part 21-2009	mg/L	354	200	600
4	Nitrate as NO <sub>3</sub>	APHA 23rd Edition 2017- 4500 -NO3 B	mg/L	46	45	45
5	Chloride as Cl	IS 3025-part 32-1988	mg/L	294	250	1000
6	Fluoride	APHA 23rd Edition 2017 - 4500- F-D	mg/L	1.30	1.0	1.5
7	Sulphate	IS 3025-part 24-1986	mg/L	75	200	400

  
A. PARAPARA SENTHIL, ASSISTANT WATER ANALYST

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4. The result applied to the sample as received basis

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Invoice Details: 3949

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012		
					Acceptable Limit	Permissible Limit	Permissible Limit
1.	Appearance	Physical observation	--	Clear	Clear	Clear	Clear
2.	Odour	IS 3025 part 5 : 1983	--	None	Agreeable	Agreeable	Agreeable
3.	Turbidity	APHA 23rd Edition 2017 - 2130 B	NTU	0.1	1	5	5
4.	Total Dissolved Solids	APHA 23rd Edition 2017 - 2540 C	mg/L	1246	500	2000	2000
5.	Conductivity	APHA 23rd Edition 2017 - 2510 B	µS/cm	1780	-	-	-
6.	P - Alkalinity	IS 3025-part 23-1983	mg/L	0	-	-	-
7.	Calcium	APHA 23rd Edition 2017 - 3500 Ca B	mg/L	96	75	200	200
8.	Magnesium	APHA 23rd Edition 2017 - 3500 Mg B	mg/L	31	30	100	100
9.	Sodium	APHA 23rd Edition 2017 - 3500 Na B	mg/L	188	-	-	-
10.	Potassium	APHA 23rd Edition 2017 - 3500 K B	mg/L	24	-	-	-
11.	Iron	APHA 23rd Edition 2017 - 3500 Fe B	mg/L	0.00	0.3	1.0	1.0
12.	Manganese	APHA 23rd Edition 2017 - 3500 Mn B	mg/L	0.00	0.1	0.3	0.3
13.	Ammonia	APHA 17th Edition-1989- 4500 NH3C	mg/L	0.00	0.5	0.5	0.5
14.	Nitrite as NO <sub>2</sub>	APHA 23rd Edition 2017- 4500-NO2 B	mg/L	0.00	-	-	-
15.	Total Phosphate as PO <sub>4</sub>	APHA 23rd Edition 2017 - 4500 P- D	mg/L	0	-	-	-
16.	Tidy's	APHA 23rd Edition 2017 - 4500 O - B	mg/L	0.20	-	-	-

Report -42155: The tested sample conformed to IS:10500 :2012 drinking water specification with respect to the tested parameters.

...End of the report...

Authorised Signatory  
APARAPARA SETHIL, ASSISTANT WATER ANALYST

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**TEST REPORT** Doc.No: DWTL/FORM/7.8/01  
Test Report No: 42156 Report Issue Date: 07/06/2022  
Invoice Details: 3950

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012		
					Acceptable Limit	Permissible Limit	Permissible Limit
1.	Appearance	Physical observation	--	Clear	Clear	Clear	Clear
2.	Odour	IS 3025 part 5 : 1983	--	None	Agreeable	Agreeable	Agreeable
3.	Turbidity	APHA 23rd Edition 2017 - 2130 B	NTU	0.1	1	5	5
4.	Total Dissolved Solids	APHA 23rd Edition 2017 - 2540 C	mg/L	602	500	2000	2000
5.	Conductivity	APHA 23rd Edition 2017 - 2510 B	µS/cm	860	-	-	-
6.	P - Alkalinity	IS 3025-part 23-1983	mg/L	0	-	-	-
7.	Calcium	APHA 23rd Edition 2017 - 3500 Ca B	mg/L	74	75	200	200
8.	Magnesium	APHA 23rd Edition 2017 - 3500 Mg B	mg/L	24	30	100	100
9.	Sodium	APHA 23rd Edition 2017 - 3500 Na B	mg/L	78	-	-	-
10.	Potassium	APHA 23rd Edition 2017 - 3500 K B	mg/L	12	-	-	-
11.	Iron	APHA 23rd Edition 2017 - 3500 Fe B	mg/L	0.00	0.3	1.0	1.0
12.	Manganese	APHA 23rd Edition 2017 - 3500 Mn B	mg/L	0.00	0.1	0.3	0.3
13.	Ammonia	APHA 17th Edition-1989- 4500 NH3C	mg/L	0.00	0.5	0.5	0.5
14.	Nitrite as NO <sub>2</sub>	APHA 23rd Edition 2017- 4500-NO2 B	mg/L	0.00	-	-	-
15.	Total Phosphate as PO <sub>4</sub>	APHA 23rd Edition 2017 - 4500 P- D	mg/L	0	-	-	-
16.	Tidy's	APHA 23rd Edition 2017 - 4500 O - B	mg/L	0.20	-	-	-

Report -42156: The tested sample conformed to IS:10500 :2012 drinking water specification with respect to the tested parameters.

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**TEST REPORT** Doc.No: DWTL/FORM/7.8/01  
Test Report No: 42156 Report Issue Date: 07/06/2022  
Invoice Details: 3950

Client Name & Address : M.Sivaprasad  
Contact No / Email.ID : 3/11A, Middle Street, Kannai West, Orathanadu, Thanjavur.

Sample Name : Water  
Sample Description : Agriculture Land  
Sample Submitted by : Student  
Location & Date : Valettery & 25/05/2022  
Quantity of sample Received : 2L  
Sample Container : Jerry Cane  
Sample Condition on Receipt : Good  
Sample Received On : 01/06/2022  
Test Commenced on : 01/06/2022  
Test Completed on : 07/06/2022  
Environmental Condition : 25.7°C

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012		
					Acceptable Limit	Permissible Limit	Permissible Limit
1	pH	IS 3025 part 11-1983	--	6.97	6.5-8.5	6.5-8.5	6.5-8.5
2	Total Alkalinity	IS 3025-part 23-1986	mg/L	216	200	600	600
3	Total Hardness as CaCO <sub>3</sub>	IS 3025 part 21-2009	mg/L	284	200	600	600
4	Nitrate as NO <sub>3</sub>	APHA 23rd Edition 2017- 4500-NO3 B	mg/L	14	45	45	45
5	Chloride as Cl	IS 3025-part 32-1988	mg/L	115	250	1000	1000
6	Fluoride	APHA 23rd Edition 2017 - 4500- F-D	mg/L	0.82	1.0	1.5	1.5
7	Sulphate	IS 3025-part 24-1986	mg/L	26	200	400	400

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**TEST REPORT** Doc.No: DWTL/FORM/7.8/01  
Test Report No: 42157 Report Issue Date: 07/06/2022  
Invoice Details: 3950

Client Name & Address : M.Sivaprasad  
Contact No / Email.ID : 3/11A, Middle Street, Kannai west, Orathanadu, Thanjavur.

Sample Name : Water  
Sample Description : Infront of House  
Sample Submitted by : Student  
Location & Date : Vallam & 25/05/2022  
Quantity of sample Received : 2L  
Sample Container : Jerry Cane  
Sample Condition on Receipt : Good  
Sample Received On : 01/06/2022  
Test Commenced on : 01/06/2022  
Test Completed on : 07/06/2022  
Environmental Condition : 25.7°C

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012		
					Acceptable Limit	Permissible Limit	Permissible Limit
1	pH	IS 3025 part 11-1983	--	6.95	6.5-8.5	6.5-8.5	6.5-8.5
2	Total Alkalinity	IS 3025-part 23-1986	mg/L	68	200	600	600
3	Total Hardness as CaCO <sub>3</sub>	IS 3025 part 21-2009	mg/L	98	200	600	600
4	Nitrate as NO <sub>3</sub>	APHA 23rd Edition 2017- 4500-NO3 B	mg/L	37	45	45	45
5	Chloride as Cl	IS 3025-part 32-1988	mg/L	44	250	1000	1000
6	Fluoride	APHA 23rd Edition 2017 - 4500- F-D	mg/L	0.78	1.0	1.5	1.5
7	Sulphate	IS 3025-part 24-1986	mg/L	7	200	400	400

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**TEST REPORT** Doc.No: DWTL/FORM/7.8/01

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S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012	
					Acceptable Limit	Permissible Limit
1.	Appearance	Physical observation	--	Clear	Clear	Clear
2.	Odour	IS 3025 part 5 : 1983	--	None	Agreeable	Agreeable
3.	Turbidity	APHA 23rd Edition 2017 - 2130 B	NTU	0.1	1	5
4.	Total Dissolved Solids	APHA 23rd Edition 2017 - 2540 C	mg/L	254	500	2000
5.	Conductivity	APHA 23rd Edition 2017 - 2510 B	µS/cm	363	-	-
6.	P - Alkalinity	IS 3025-part 23-1983	mg/L	0	-	-
7.	Calcium	APHA 23rd Edition 2017 - 3500 Ca B	mg/L	26	75	200
8.	Magnesium	APHA 23rd Edition 2017 - 3500 Mg B	mg/L	8	30	100
9.	Sodium	APHA 23rd Edition 2017 - 3500 Na B	mg/L	32	-	-
10.	Potassium	APHA 23rd Edition 2017 - 3500 K B	mg/L	2	-	-
11.	Iron	APHA 23rd Edition 2017 - 3500 Fe B	mg/L	0.00	0.3	1.0
12.	Manganese	APHA 23rd Edition 2017 - 3500 Mn B	mg/L	0.00	0.1	0.3
13.	Ammonia	APHA 17th Edition-1989- 4500 NH3C	mg/L	0.00	0.5	0.5
14.	Nitrite as NO <sub>2</sub>	APHA 23rd Edition 2017 - 4500 -NO2 B	mg/L	0.00	-	-
15.	Total Phosphate as PO <sub>4</sub>	APHA 23rd Edition 2017 - 4500 P - D	mg/L	0	-	-
16.	Tidy's	APHA 23rd Edition 2017 - 4500 O - B	mg/L	0.20	-	-

Report : 42157: The tested sample conformed to IS:10500 :2012 drinking water specification with respect to the tested parameters .

...End of the report...

Authorised Signatory  
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S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012	
					Acceptable Limit	Permissible Limit
8.	Appearance	Physical observation	--	Clear	Clear	Clear
9.	Odour	IS 3025 part 5 : 1983	--	None	Agreeable	Agreeable
10.	Turbidity	APHA 23rd Edition 2017 - 2130 B	NTU	0.5	1	5
11.	Total Dissolved Solids	APHA 23rd Edition 2017 - 2540 C	mg/L	671	500	2000
12.	Conductivity	APHA 23rd Edition 2017 - 2510 B	µS/cm	958	-	-
13.	P - Alkalinity	IS 3025-part 23-1983	mg/L	0	-	-
14.	Calcium	APHA 23rd Edition 2017 - 3500 Ca B	mg/L	72	75	200
15.	Magnesium	APHA 23rd Edition 2017 - 3500 Mg B	mg/L	24	30	100
16.	Sodium	APHA 23rd Edition 2017 - 3500 Na B	mg/L	105	-	-
17.	Potassium	APHA 23rd Edition 2017 - 3500 K B	mg/L	12	-	-
18.	Iron	APHA 23rd Edition 2017 - 3500 Fe B	mg/L	0.00	0.3	1.0
19.	Manganese	APHA 23rd Edition 2017 - 3500 Mn B	mg/L	0.00	0.1	0.3
20.	Ammonia	APHA 17th Edition-1989- 4500 NH3C	mg/L	0.00	0.5	0.5
21.	Nitrite as NO <sub>2</sub>	APHA 23rd Edition 2017 - 4500 -NO2 B	mg/L	0.10	-	-
22.	Total Phosphate as PO <sub>4</sub>	APHA 23rd Edition 2017 - 4500 P - D	mg/L	0	-	-
23.	Tidy's	APHA 23rd Edition 2017 - 4500 O - B	mg/L	0.32	-	-

Report : 42158: The tested sample conformed to IS:10500 :2012 drinking water specification with respect to the tested parameters .

...End of the report...

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Test Report No: 42158 Report Issue Date : 07/06/2022  
Invoice Details: 3950

Client Name & Address : M.Sivaprasad  
Contact No / Email.ID : 3/11A,Middle Street,Kannai west, Orathanadu ,Thanjavur.

Sample Name : Water  
Sample Description : House back side  
Sample Submitted by : Student  
Location & Date : Ayyampettai & 25/05/2022  
Quantity of sample Received : 2L  
Sample Container : Jerry Cane  
Sample Condition on Receipt : Good  
Sample Received On : 01/06/2022  
Test Commenced on : 01/06/2022  
Test Completed on : 07/06/2022  
Environmental Condition : 25.7°C

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012	
					Acceptable Limit	Permissible Limit
1	pH	IS 3025 part 11-1983	--	7.14	6.5-8.5	6.5-8.5
2	Total Alkalinity	IS 3025-part 23-1986	mg/L	268	200	600
3	Total Hardness as CaCO <sub>3</sub>	IS 3025 part 21-2009	mg/L	278	200	600
4	Nitrate as NO <sub>3</sub>	APHA 23rd Edition 2017- 4500 -NO3 B	mg/L	1	45	45
5	Chloride as Cl	IS 3025-part 32-1988	mg/L	105	250	1000
6	Fluoride	APHA 23rd Edition 2017 - 4500- F-D	mg/L	0.82	1.0	1.5
7	Sulphate	IS 3025-part 24-1986	mg/L	59	200	400

Authorised Signatory  
A.PARAPARA SENTHIL, ASSISTANT WATER ANALYST

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  - The result applied to the sample as received basis.

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TAMILNADU WATER SUPPLY AND DRAINAGE BOARD  
DISTRICT WATER TESTING LABORATORY  
Elizha Nagar Service Reservoir, Near Sarafuzi College,  
Thanjavur-613005.  
Phone: 04362-227387 E-mail: awatwadthanjavur@gmail.com



**TEST REPORT** Doc.No: DWTL/FORM/7.8/01

Test Report No: 42155 Report Issue Date : 07 /06/2022  
Invoice Details: 3949

Client Name & Address : M.Sheik Abdulla  
Contact No / Email.ID : PL No 50 Karups nagar Near New Bus Stand, Thanjavur

Sample Name : Water  
Sample Description : Agriculture Land  
Sample Submitted by : Student  
Location & Date : Athirampattinam & 25/05/2022  
Quantity of sample Received : 2L  
Sample Container : Jerry Cane  
Sample Condition on Receipt : Good  
Sample Received On : 01/06/2022  
Test Commenced on : 01/06/2022  
Test Completed on : 07/06/2022  
Environmental Condition : 25.7°C

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012	
					Acceptable Limit	Permissible Limit
1	pH	IS 3025 part 11-1983	--	7.26	6.5-8.5	6.5-8.5
2	Total Alkalinity	IS 3025-part 23-1986	mg/L	364	200	600
3	Total Hardness as CaCO <sub>3</sub>	IS 3025 part 21-2009	mg/L	370	200	600
4	Nitrate as NO <sub>3</sub>	APHA 23rd Edition 2017- 4500 -NO3 B	mg/L	9	45	45
5	Chloride as Cl	IS 3025-part 32-1988	mg/L	246	250	1000
6	Fluoride	APHA 23rd Edition 2017 - 4500- F-D	mg/L	0.87	1.0	1.5
7	Sulphate	IS 3025-part 24-1986	mg/L	76	200	400

Authorised Signatory  
A.PARAPARA SENTHIL, ASSISTANT WATER ANALYST

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Thanjavur-613005.  
Phone: 04362-227387 E-mail: awatwadhanjavur@gmail.com

**TEST REPORT** Doc No: DWTL/FORM/7.8/01

Test Report No: 42159 Report Issue Date : 07/06/2022  
Invoice Details: 3951

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012	
					Acceptable Limit	Permissible Limit
1.	Appearance	Physical observation	--	Clear	Clear	Clear
2.	Odour	IS 3025 part 5 : 1983	--	None	Agreeable	Agreeable
3.	Turbidity	APHA 23rd Edition 2017 - 2130 B	NTU	0.4	1	5
4.	Total Dissolved Solids	APHA 23rd Edition 2017 - 2540 C	mg/L	770	500	2000
5.	Conductivity	APHA 23rd Edition 2017 - 2510 B	µS/cm	1100	-	-
6.	P - Alkalinity	IS 3025-part 23-1983	mg/L	0	-	-
7.	Calcium	APHA 23rd Edition 2017 - 3500 Ca B	mg/L	77	75	200
8.	Magnesium	APHA 23rd Edition 2017 - 3500 Mg B	mg/L	25	30	100
9.	Sodium	APHA 23rd Edition 2017 - 3500 Na B	mg/L	108	-	-
10.	Potassium	APHA 23rd Edition 2017 - 3500 K B	mg/L	12	-	-
11.	Iron	APHA 23rd Edition 2017 - 3500 Fe B	mg/L	0.00	0.3	1.0
12.	Manganese	APHA 23rd Edition 2017 - 3500 Mn B	mg/L	0.00	0.1	0.3
13.	Ammonia	APHA 17th Edition-1989- 4500 NH3C	mg/L	0.00	0.5	0.5
14.	Nitrite as NO <sub>2</sub>	APHA 23rd Edition 2017 - 4500 -NO2 B	mg/L	0.00	-	-
15.	Total Phosphate as PO <sub>4</sub>	APHA 23rd Edition 2017 - 4500 P- D	mg/L	0	-	-
16.	Tidy's	APHA 23rd Edition 2017 - 4500 O - B	mg/L	0.20	-	-

Report : 42159 : The tested sample conformed to IS:10500 :2012 drinking water specification with respect to the tested parameters .

...End of the report...

Authorised Signatory  
A.PARAPARA SETHIL, ASSISTANT WATER ANALYST

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Elizha Nagar Service Reservoir, Near Sarafozi College,  
Thanjavur-613005.  
Phone: 04362-227387 E-mail: awatwadhanjavur@gmail.com

**TEST REPORT** Doc No: DWTL/FORM/7.8/01

Test Report No: 42160 Report Issue Date : 07/06/2022  
Invoice Details: 3951

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012	
					Acceptable Limit	Permissible Limit
8.	Appearance	Physical observation	--	Clear	Clear	Clear
9.	Odour	IS 3025 part 5 : 1983	--	None	Agreeable	Agreeable
10.	Turbidity	APHA 23rd Edition 2017 - 2130 B	NTU	2.2	1	5
11.	Total Dissolved Solids	APHA 23rd Edition 2017 - 2540 C	mg/L	517	500	2000
12.	Conductivity	APHA 23rd Edition 2017 - 2510 B	µS/cm	739	-	-
13.	P - Alkalinity	IS 3025-part 23-1983	mg/L	0	-	-
14.	Calcium	APHA 23rd Edition 2017 - 3500 Ca B	mg/L	61	75	200
15.	Magnesium	APHA 23rd Edition 2017 - 3500 Mg B	mg/L	20	30	100
16.	Sodium	APHA 23rd Edition 2017 - 3500 Na B	mg/L	72	-	-
17.	Potassium	APHA 23rd Edition 2017 - 3500 K B	mg/L	8	-	-
18.	Iron	APHA 23rd Edition 2017 - 3500 Fe B	mg/L	0.45	0.3	1.0
19.	Manganese	APHA 23rd Edition 2017 - 3500 Mn B	mg/L	0.00	0.1	0.3
20.	Ammonia	APHA 17th Edition-1989- 4500 NH3C	mg/L	0.00	0.5	0.5
21.	Nitrite as NO <sub>2</sub>	APHA 23rd Edition 2017 - 4500 -NO2 B	mg/L	0.00	-	-
22.	Total Phosphate as PO <sub>4</sub>	APHA 23rd Edition 2017 - 4500 P- D	mg/L	0	-	-
23.	Tidy's	APHA 23rd Edition 2017 - 4500 O - B	mg/L	0.20	-	-

Report : 42160 : The tested sample conformed to IS:10500 :2012 drinking water specification with respect to the tested parameters .

...End of the report...

Authorised Signatory  
A.PARAPARA SETHIL, ASSISTANT WATER ANALYST

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- The result applied to the sample as received basis

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TAMILNADU WATER SUPPLY AND DRAINAGE BOARD  
DISTRICT WATER TESTING LABORATORY  
Elizha Nagar Service Reservoir, Near Sarafozi College,  
Thanjavur-613005.  
Phone: 04362-227387 E-mail: awatwadhanjavur@gmail.com



**TEST REPORT** Doc No: DWTL/FORM/7.8/01

Test Report No: 42159 Report Issue Date : 07/06/2022  
Invoice Details: 3951

Client Name & Address : K.Sujith  
3/674,Middle Street, Maharajapuram,  
Thirumakkottai,Mannargudi  
Thiruvavur-614017  
Contact No / Email.ID  
Sample Name : Water  
Sample Description : Agriculture land  
Sample Submitted by : Student  
Location & Date : Thiruvaiyaru & 25/05/2022  
Quantity of sample Received : 2L  
Sample Container : Jerry Cane  
Sample Condition on Receipt : Good  
Sample Received On : 01/06/2022  
Test Commenced on : 01/06/2022  
Test Completed on : 07/06/2022  
Environmental Condition : 25.7°C

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012	
					Acceptable Limit	Permissible Limit
1	pH	IS 3025 part 11-1983	--	7.45	6.5-8.5	6.5-8.5
2	Total Alkalinity	IS 3025-part 23-1986	mg/L	288	200	600
3	Total Hardness as CaCO <sub>3</sub>	IS 3025 part 21-2009	mg/L	298	200	600
4	Nitrate as NO <sub>3</sub>	APHA 23rd Edition 2017 - 4500 -NO3 B	mg/L	10	45	45
5	Chloride as Cl	IS 3025-part 32-1988	mg/L	127	250	1000
6	Fluoride	APHA 23rd Edition 2017 - 4500- F-D	mg/L	1.03	1.0	1.5
7	Sulphate	IS 3025-part 24-1986	mg/L	68	200	400

Authorised Signatory  
A.PARAPARA SETHIL, ASSISTANT WATER ANALYST

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Thanjavur-613005.  
Phone: 04362-227387 E-mail: awatwadhanjavur@gmail.com

**TEST REPORT** Doc No: DWTL/FORM/7.8/01

Test Report No: 42160 Report Issue Date : 07/06/2022  
Invoice Details: 3951

Client Name & Address : K.Sujith  
3/674,Middle Street, Maharajapuram,  
Thirumakkottai,Mannargudi  
Thiruvavur-614017  
Contact No / Email.ID  
Sample Name : Water  
Sample Description : Agriculture land  
Sample Submitted by : Student  
Location & Date : Cholapuram & 25/05/2022  
Quantity of sample Received : 2L  
Sample Container : Jerry Cane  
Sample Condition on Receipt : Good  
Sample Received On : 01/06/2022  
Test Commenced on : 01/06/2022  
Test Completed on : 07/06/2022  
Environmental Condition : 25.7°C

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012	
					Acceptable Limit	Permissible Limit
1	pH	IS 3025 part 11-1983	--	7.32	6.5-8.5	6.5-8.5
2	Total Alkalinity	IS 3025-part 23-1986	mg/L	216	200	600
3	Total Hardness as CaCO <sub>3</sub>	IS 3025 part 21-2009	mg/L	234	200	600
4	Nitrate as NO <sub>3</sub>	APHA 23rd Edition 2017 - 4500 -NO3 B	mg/L	1	45	45
5	Chloride as Cl	IS 3025-part 32-1988	mg/L	80	250	1000
6	Fluoride	APHA 23rd Edition 2017 - 4500- F-D	mg/L	0.72	1.0	1.5
7	Sulphate	IS 3025-part 24-1986	mg/L	51	200	400

Authorised Signatory  
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DISTRICT WATER TESTING LABORATORY  
Elizha Nagar Service Reservoir, Near Sarafozi College,  
Thanjavur-613005.  
Phone: 04362-227387 E-mail: awatwadthanjavur@gmail.com

#### IV. CONCLUSION

Prevention is better than cure. Since purification of contaminated groundwater is an expensive and time taking process, it is better to try and collectively work together to avoid groundwater contamination at source stage itself. Since this study has identified contamination from sewage as the main cause for groundwater contamination in the study area - all steps to curtail it and prevent further deterioration should be taken up immediately.

#### REFERENCES

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#### TEST REPORT

Doc.No: DWTLFORM7.8/01  
Test Report No: 42154 Report Issue Date : 07/06/2022  
Invoice Details: 3949

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012	
					Acceptable Limit	Permissible Limit
1.	Appearance	Physical observation	--	Clear	Clear	Clear
2.	Odour	IS 3025 part 5 : 1983	--	None	Agreeable	Agreeable
3.	Turbidity	APHA 23rd Edition 2017 - 2130 B	NTU	0.2	1	5
4.	Total Dissolved Solids	APHA 23rd Edition 2017 - 2540 C	mg/L	1495	500	2000
5.	Conductivity	APHA 23rd Edition 2017 - 2510 B	µS/cm	2136	-	-
6.	P- Alkalinity	IS 3025-part 23-1983	mg/L	0	-	-
7.	Calcium	APHA 23rd Edition 2017 - 3500 Ca B	mg/L	91	75	200
8.	Magnesium	APHA 23rd Edition 2017- 3500 Mg B	mg/L	30	30	100
9.	Sodium	APHA 23rd Edition 2017 - 3500 Na B	mg/L	268	-	-
10.	Potassium	APHA 23rd Edition 2017 - 3500 K B	mg/L	28	-	-
11.	Iron	APHA 23rd Edition 2017- 3500 Fe B	mg/L	0.00	0.3	1.0
12.	Manganese	APHA 23rd Edition 2017 - 3500 Mn B	mg/L	0.00	0.1	0.3
13.	Ammonia	APHA 7th Edition- 1989- 4500 NH3C	mg/L	0.00	0.5	0.5
14.	Nitrite as NO <sub>2</sub>	APHA 23rd Edition 2017- 4500-NO2 B	mg/L	0.22	-	-
15.	Total Phosphate as PO <sub>4</sub>	APHA 23rd Edition 2017 - 4500 P- D	mg/L	0	-	-
16.	Tidy's	APHA 23rd Edition 2017 - 4500 O- B	mg/L	0.42	-	-

Report : 42154 : The tested sample not conformed to IS:10500 :2012 drinking water specification with respect to the tested parameters.

...End of the report...

  
Authorised Signatory  
A.PARAPARA SETHIL, ASSISTANT WATER ANALYST

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  4. The result applied to the sample as received basis.

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Elizha Nagar Service Reservoir, Near Sarafozi College,  
Thanjavur-613005.  
Phone: 04362-227387 E-mail: awatwadthanjavur@gmail.com

#### TEST REPORT

Doc.No: DWTLFORM7.8/01  
Test Report No: 42161 Report Issue Date : 07/06/2022  
Invoice Details: 3951

Client Name & Address	: K Sujith 3/674, Middle Street, Maharajapuram, Thirumakkottai, Mannargudi Thiruvavur-614017
Sample Name	: Water
Sample Description	: Agriculture land
Sample Submitted by	: Student
Location & Date	: Nur & 25/05/2022
Quantity of sample Received	: 2L
Sample Container	: Jerry Cane
Sample Condition on Receipt	: Good
Sample Received On	: 01/06/2022
Test Commenced on	: 01/06/2022
Test Completed on	: 07/06/2022
Environmental Condition	: 25.7°C

S.No	Parameters	Test Method	Unit	Result	Specification as per IS 10500 : 2012	
					Acceptable Limit	Permissible Limit
1	pH	IS 3025 part 11-1983	--	7.74	6.5-8.5	6.5-8.5
2	Total Alkalinity	IS 3025-part 23-1986	mg/L	320	200	600
3	Total Hardness as CaCO <sub>3</sub>	IS 3025 part 21-2009	mg/L	300	200	600
4	Nitrate as NO <sub>3</sub>	APHA 23rd Edition 2017- 4500-NO3 B	mg/L	0	45	45
5	Chloride as Cl	IS 3025-part 32-1988	mg/L	101	250	1000
6	Fluoride	APHA 23rd Edition 2017 - 4500- F-D	mg/L	1.00	1.0	1.5
7	Sulphate	IS 3025-part 24-1986	mg/L	62	200	400

  
Authorised Signatory  
A.PARAPARA SETHIL, ASSISTANT WATER ANALYST

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Issue No./Date : 01/01.10.2021 Amend. No/ Date : 01/2.01.2022 Page No : Page 1 of 2

**Citation of this Article:**

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