



CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD
QUALITY ASSURANCE WING, WATER ANALYSIS LABORATORY
NEW AVADI ROAD, CHENNAI - 600 010.

STUDY PURPOSE

- 1 Challan No. 823 Rs.525/- Date: 16.02.17
2 Date of Collection 16.02.17
3 Date of Receipt 16.02.17
4 Source as per Lable Normal Water (befour treatment)
5 Sample collected by Anand Institute of Higher Technology Kazhipattur, Chennai
603 103

6 RESULTS OF PHYSICAL AND CHEMICAL EXAMINATION

		IS:10500-2012 ACCEPTABLE LIMIT	IS:10500-2012 PERMISSIBLE LIMIT
(i) Colour	Colourless & Clear		
(ii) Odour	Nil	Agreeable	Agreeable
(iii) Turbidity (N.T.U)	0.1	1	10
(iv) Total Dissolved Solids at 105 °C (mg/l)	1140	500	2000
(v) Calcium (As Ca) (mg/l)	124	75	200
(vi) Magnesium (As Mg) (mg/l)	58	30	100
(vii) Total Hardness(As CaCO ₃) (mg/l)	550	200	600
(viii) Chlorides (As Cl) (mg/l)	260	250	1000
(ix) Ammoniacal Nitrogen (as N) (mg/l)	0.040	-	-
(x) Albuminoid Nitrogen (as N) (mg/l)	0.030	-	-
(xi) Nitrous Nitrogen (As N) (mg/l)	Nil	-	-
(xii) Oxygen absorbed (Tidy's 4 hours test)(mg/l)	0.75	-	-
(xiii) Hydrogen Ion Concentration (pH)	7.2	6.5 TO 8.5	6.5 TO 8.5
(xiv) Alkalinity to Phenolphthalein (AS CaCO ₃) (mg/l)	Nil	Nil	
(xv) Alkalinity to methyl orange (As CaCO ₃) (mg/l)	320	200	600
(xvi) Sulphates (As SO ₄) (mg/l)	420	200	400
(xvii) Phosphates (as PO ₄) (mg/l)	0.010	-	-
(xviii) Iron (As Fe) (mg/l)	Trace	0.30	1.0
(xix) Fluorides (as F) mg/l)	0.10	1.0	1.5
(xx) Specific Conductance(micro Siemens/cm) at 25°C	1755	-	-

[Signature]
WATER ANALYST

[Signature] 22/2/17
CHIEF ANALYST

Figure 4.13 Study of Normal Water before Plasma Discharge



CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD
QUALITY ASSURANCE WING, WATER ANALYSIS LABORATORY
NEW AVADI ROAD, CHENNAI - 600 010.

STUDY PURPOSE

1 Challan No. 823 Rs.525/- Date: 16.02.17
2 Date of Collection 16.02.17
3 Date of Receipt 16.02.17
4 Source as per Lable Normal Wter (After treatment)
5 Sample collected by Anand Institute of Higher Technology Kazhipattur, Chennai
603 103.

6 RESULTS OF PHYSICAL AND CHEMICAL EXAMINATION

		IS:10500-2012 ACCEPTABLE LIMIT	IS:10500-2012 PERMISSIBLE LIMIT
(i) Colour	Colourless & Clear		
(ii) Odour	Nil	Agreeable	Agreeable
(iii) Turbidity (N.T.U)	0.1	1	10
(iv) Total Dissolved Solids at 105 °C (mg/l)	475	500	2000
(v) Calcium (As Ca) (mg/l)	32	75	200
(vi) Magnesium (As Mg) (mg/l)	17	30	100
(vii) Total Hardness(As CaCO ₃) (mg/l)	148	200	600
(viii) Chlorides (As Cl) (mg/l)	144	250	1000
(ix) Ammoniacal Nitrogen (as N) (mg/l)	0.040	-	-
(x) Albuminoid Nitrogen (as N) (mg/l)	0.040	-	-
(xi) Nitrous Nitrogen (As N) (mg/l)	Nil	-	-
(xii) Oxygen absorbed (Tidy's 4 hours test)(mg/l)	0.45	-	-
(xiii) Hydrogen Ion Concentration (pH)	6.5	6.5 TO 8.5	6.5 TO 8.5
(xiv) Alkalinity to Phenolphthalein (AS CaCO ₃) (mg/l)	Nil	Nil	
(xv) Alkalinity to methyl orange (As CaCO ₃) (mg/l)	60	200	600
(xvi) Sulphates (As SO ₄) (mg/l)	132	200	400
(xvii) Phosphates (as PO ₄) (mg/l)	0.010	-	-
(xviii) Iron (As Fe) (mg/l)	Trace	0.30	1.0
(xix) Fluorides (as F) mg/l)	0.10	1.0	1.5
(xx) Specific Conductance(micro Siemens/cm) at 25°C	730	-	-

WATER ANALYST

CHIEF ANALYST

Figure 4.14 Study of Normal Water after Plasma Discharge



CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD
QUALITY ASSURANCE WING, WATER ANALYSIS LABORATORY
NEW AVADI ROAD, CHENNAI - 600 010.

STUDY PURPOSE

- 1 Challan No. 799 Rs. 600/- Date: 10.02.17
- 2 Date of Collection 10.02.17
- 3 Date of Receipt 10.02.17
- 4 Source as per Lable Dye With Water (befour treatment)
- 5 Sample collected by Anand Institute of Higher Technology, OMR Rd., Kazhipattur, Chennai 603 103.

6 RESULTS OF PHYSICAL AND CHEMICAL EXAMINATION

		IS:10500-2012 ACCEPTABLE LIMIT	IS:10500-2012 PERMISSIBLE LIMIT
(i) Colour	Greenish		
(ii) Odour	Earthy	Agreeable	Agreeable
(iii) Turbidity (N.T.U)	69	1	10
(iv) Total Dissolved Solids at 105 °C (mg/l)	975	500	2000
(v) Calcium (As Ca) (mg/l)	92	75	200
(vi) Magnesium (As Mg) (mg/l)	41	30	100
(vii) Total Hardness(As CaCO ₃) (mg/l)	400	200	600
(viii) Chlorides (As Cl) (mg/l)	330	250	1000
(ix) Ammoniacal Nitrogen (as N) (mg/l)	0.090	-	-
(x) Albuminoid Nitrogen (as N) (mg/l)	0.220	-	-
(xi) Nitrous Nitrogen (As N) (mg/l)	Nil	-	-
(xii) Oxygen absorbed (Tidy's 4 hours test)(mg/l)	3.43	-	-
(xiii) Hydrogen Ion Concentration (pH)	8.6	6.5 TO 8.5	6.5 TO 8.5
(xiv) Alkalinity to Phenolphthalein (AS CaCO ₃) (mg/l)	25	Nil	
(xv) Alkalinity to methyl orange (As CaCO ₃) (mg/l)	336	200	600
(xvi) Sulphates (As SO ₄) (mg/l)	140	200	400
(xvii) Phosphates (as PO ₄) (mg/l)	0.010	-	-
(xviii) Iron (As Fe) (mg/l)	0.30	0.30	1.0
(xix) Fluorides (as F) mg/l)	0.10	1.0	1.5
(xx) Specific Conductance(micro Siemens/cm) at 25°C	1500	-	-

A. V. Anand
WATER ANALYST

A. V. Anand 21.2.17
CHIEF ANALYST

Figure 4.15 Study of Dye with Water before Plasma Discharge



CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD
QUALITY ASSURANCE WING, WATER ANALYSIS LABORATORY
NEW AVADI ROAD, CHENNAI - 600 010.


1 **Challan No. 799** **Rs.600/-** **STUDY PURPOSE**
2 Date of Collection **Date:** 10.02.17
3 Date of Receipt 10.02.17
4 Source as per Lable 10.02.17
Dye with Water (After treatment)
5 Sample collected by Anand Institute of Higher Technology, OMR
Rd., Kazhipattur, Chennai 603 103.

6 RESULTS OF PHYSICAL AND CHEMICAL EXAMINATION		IS:10500-2012 ACCEPTABLE LIMIT	IS:10500-2012 PERMISSIBLE LIMIT
(i) Colour	Colourless & Clear		
(ii) Odour	Nil	Agreeable	Agreeable
(iii) Turbidity (N.T.U)	0.5	1	10
(iv) Total Dissolved Solids at 105 °C (mg/l)	975	500	2000
(v) Calcium (As Ca) (mg/l)	96	75	200
(vi) Magnesium (As Mg) (mg/l)	70	30	100
(vii) Total Hardness(As CaCO ₃) (mg/l)	530	200	600
(viii) Chlorides (As Cl) (mg/l)	200	250	1000
(ix) Ammoniacal Nitrogen (as N) (mg/l)	0.030	-	-
(x) Albuminoid Nitrogen (as N) (mg/l)	0.040	-	-
(xi) Nitrous Nitrogen (As N) (mg/l)	Trace	-	-
(xii) Oxygen absorbed (Tidy's 4 hours test)(mg/l)	0.24	-	-
(xiii) Hydrogen Ion Concentration (pH)	7.5	6.5 TO 8.5	6.5 TO 8.5
(xiv) Alkalinity to Phenolphthalein (AS CaCO ₃) (mg/l)	Nil	Nil	
(xv) Alkalinity to methyl orange (As CaCO ₃) (mg/l)	200	200	600
(xvi) Sulphates (As SO ₄) (mg/l)	190	200	400
(xvii) Phosphates (as PO ₄) (mg/l)	0.010	-	-
(xviii) Iron (As Fe) (mg/l)	0.20	0.30	1.0
(xix) Fluorides (as F) mg/l)	0.10	1.0	1.5
(xx) Specific Conductance(micro Siemens/cm) at 25°C	1500	-	-

WATER ANALYST

21.2.17
CHIEF ANALYST

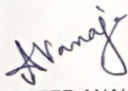
Figure 4.16 Study of Dye with Water after Plasma Discharge


CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD
 • QUALITY ASSURANCE WING, WATER ANALYSIS LABORATORY
 NEW AVADI ROAD, CHENNAI - 600 010.

STUDY PURPOSE

1 Challan No. 799	Rs.600/-	Date:	10.02.17
2 Date of Collection			10.02.17
3 Date of Receipt			10.02.17
4 Source as per Lable	Humic acid water (before treatment)		
5 Sample collected by	Anand Institute of Higher Technology, OMR Rd., Kazhipattur, Chennai 603 103.		

6 RESULTS OF PHYSICAL AND CHEMICAL EXAMINATION	IS:10500-2012 ACCEPTABLE LIMIT	IS:10500-2012 PERMISSIBLE LIMIT
(i) Colour	Slightly Yellowish	
(ii) Odour	Earthy	Agreeable
(iii) Turbidity (N.T.U)	35	1
(iv) Total Dissolved Solids at 105 °C (mg/l)	890	500
(v) Calcium (As Ca) (mg/l)	72	75
(vi) Magnesium (As Mg) (mg/l)	53	30
(vii) Total Hardness(As CaCO ₃) (mg/l)	400	200
(viii) Chlorides (As Cl) (mg/l)	320	250
(ix) Ammoniacal Nitrogen (as N) (mg/l)	0.048	-
(x) Albuminoid Nitrogen (as N) (mg/l)	0.040	-
(xi) Nitrous Nitrogen (As N) (mg/l)	Nil	-
(xii) Oxygen absorbed (Tidy's 4 hours test)(mg/l)	2.92	-
(xiii) Hydrogen Ion Concentration (pH)	8.6	6.5 TO 8.5
(xiv) Alkalinity to Phenolphthalein (AS CaCO ₃) (mg/l)	34	Nil
(xv) Alkalinity to methyl orange (As CaCO ₃) (mg/l)	328	200
(xvi) Sulphates (As SO ₄) (mg/l)	150	200
(xvii) Phosphates (as PO ₄) (mg/l)	0.050	-
(xviii) Iron (As Fe) (mg/l)	0.25	0.30
(xix) Fluorides (as F) mg/l)	0.10	1.0
(xx) Specific Conductance(micro Siemens/cm) at 25°C	1370	-


 WATER ANALYST

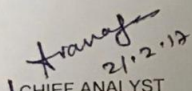

 CHIEF ANALYST

Figure 4.17 Study of Humic Acid with Water before Plasma Discharge



CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD
QUALITY ASSURANCE WING, WATER ANALYSIS LABORATORY
NEW AVADI ROAD, CHENNAI - 600 010.

STUDY PURPOSE

- 1 Challan No. 799 Rs.600/- Date: 10.02.17
2 Date of Collection 10.02.17
3 Date of Receipt 10.02.17
4 Source as per Lable Humic acid Water (After treatment) †
5 Sample collected by Anand Institute of Higher Technology, OMR Rd., Kazhipattur, Chennai 603 103.

6 RESULTS OF PHYSICAL AND CHEMICAL EXAMINATION

		IS:10500-2012 ACCEPTABLE LIMIT	IS:10500-2012 PERMISSIBLE LIMIT
(i) Colour	Colourless & Clear		
(ii) Odour	Nil	Agreeable	Agreeable
(iii) Turbidity (N.T.U)	0.4	1	10
(iv) Total Dissolved Solids at 105 °C (mg/l)	1220	500	2000
(v) Calcium (As Ca) (mg/l)	220	75	200
(vi) Magnesium (As Mg) (mg/l)	56	30	100
(vii) Total Hardness(As CaCO ₃) (mg/l)	780	200	600
(viii) Chlorides (As Cl) (mg/l)	430	250	1000
(ix) Ammoniacal Nitrogen (as N) (mg/l)	0.030	-	-
(x) Albuminoid Nitrogen (as N) (mg/l)	0.030	-	-
(xi) Nitrous Nitrogen (As N) (mg/l)	Trace	-	-
(xii) Oxygen absorbed (Tidy's 4 hours test)(mg/l)	0.30	-	-
(xiii) Hydrogen Ion Concentration (pH)	7.5	6.5 TO 8.5	6.5 TO 8.5
(xiv) Alkalinity to Phenolphthalein (AS CaCO ₃) (mg/l)	Nil	Nil	
(xv) Alkalinity to methyl orange (As CaCO ₃) (mg/l)	300	200	600
(xvi) Sulphates (As SO ₄) (mg/l)	450	200	400
(xvii) Phosphates (as PO ₄) (mg/l)	0.010	-	-
(xviii) Iron (As Fe) (mg/l)	0.20	0.30	1.0
(xix) Fluorides (as F) mg/l)	0.10	1.0	1.5
(xx) Specific Conductance(micro Siemens/cm) at 25°C	1880	-	-

[Signature]
WATER ANALYST

[Signature]
21.2.12
CHIEF ANALYST

Figure 4.18 Study of Humic Acid with Water after Plasma Discharge