BEFORE THE NATIONAL GREEN TRIBUNAL

SOUTHERN BENCH, CHENNAI

Original Application No. 259 of 2020

2 of 2021

In the matter of:

In Re: **"Mystery illness raises concerns over Kolleru pollution".**

INDEX

Joint Chief Environmental Engineer
A.P.POLLUTION CONTROL BOARD
ZONAL OFFICE
VISAKHAPATNAM

Status report on Hon'ble NGT order dated 06.01.2021 in O.A.No.2 of 2021 and in OA No. 259 of 2020

It is to submit that the Hon'ble NGT has taken up Suo Motu in O.A.No.02 of 2021 the incident of **"Mystery illness raises concerns over Kolleru pollution"** based on news paper clipping published in Hindu Newspaper on 15.12.2020 status. It is alleged that large scale pollution is caused in Kolleru Lake and other water bodies in AP and people are suffering from Mysterious diseases on account of drinking of the polluted water in Kolleru Lake. The Hon'ble NGT vide order dated 06.01.2021 in OA No.2 has directed to post the matters along with matters of OA No. 259 of 2020.

The Board submitted report in O.A.No.259 of 2020 to the Hon'ble Tribunal in December 2020 regarding deaths in Eluru on account of mysterious disease. It was submitted that:

1. As mentioned in the news papers, the suspected cause for the incident reported by All India Institute of Medical Sciences (AIIMS) is due to the presence of Lead and Nickel found in excess to the desirable limits in the blood samples of affected people. Further, AIIMS indicated the symptoms of affected people may be due to Organochlorine pesticides.
2. From the studies conducted by CSIR-NEERI, it was observed that there was no contamination of surface and ground water of Eluru town due to Lead and Nickel. Even as per APPCB analysis reports, there was no contamination of surface and ground water of Eluru town due to Lead and Nickel except at one location i.e. Kotadibba water tank (overhead tank) the concentration of lead is 0.0174mg/l, slightly higher than the standard of 0.010mg/l.
3. In Surface water, high levels of Mercury ranging from 1.0 to 9.0 ppb were reported by CSIR-NEERI, the maximum found in location at Krishna Canal. As per APPCB results, the concentration of Mercury is ranging from 0.0 to 1.1 ppb, the maximum value reported in Eluru canal, Near Denduluru which is marginally higher than the standard.
4. In Ground water, high levels of Mercury ranging from 1.1 to 26 ppb were reported by CSIR-NEERI, the maximum found in location at RR Peta. As per APPCB results, the concentration of Mercury is ranging from 0 to 1.2 ppb, the maximum value reported at the same location RR Peta which is marginally higher than the standard.
5. Other heavy metal concentrations in surface and ground water are observed to be within the norms except Iron and Manganese detection in few locations at slightly higher concentrations.
6. Organochlorine pesticide residues were not detected in the analysis carried out by both CSIR-NEERI and APPCB in ground and surface water. CSIR-NEERI reported presence of Chloropyriphos in excess of the standard in ground water samples at 1 location (Opposite to H.No: 21-379, Construction land, Ponangi).

7. As per Ambient air quality monitoring (conducted from 10.12.2020 to 12.12.2020) of CSIR-NEERI, higher concentrations of Particulate matter are reported. Ambient air concentration of Lead and Nickel is found to be within the norms whereas slightly higher concentrations of Arsenic was reported which may be due to vehicle transportation, waste incineration or burning, Oil & Coal combustion and construction activities. APPCB carried out AAQM at 3 locations from 06.12.2020 to 07.12.2020. Concentrations of Particulate matter and Heavy metals (Lead, Arsenic and Nickel) are within the NAAQ standards.
8. CSIR-NEERI recommended that Periodic Assessment on monthly basis of all environmental components including critically identified pollutants need to be conducted for at least next 6 months to ascertain the occurrence of certain heavy metals in ambient air and presence of mercury in both groundwater and surface water.
9. The Government of A.P. constituted a multi disciplinary committee headed by the Chief Secretary to the Government to investigate source of episode and suggest remedial measures to prevent any occurrence of such events in future.
10. APPCB proposes to carry out Air and water quality monitoring on monthly basis for a period of six months to ascertain the presence of Mercury in Surface and Ground water samples and presence of heavy metal concentrations in Ambient air.

As regards to the apprehensions of the people that polluted water of Kolleru Lake might cause mysterious diseases as reported in Eluru and the surrounding areas, the following report is submitted on Kolleru lake pollution for kind perusal:

A. About Kolleru Lake:

1) Kolleru Lake is one of the largest fresh water Eco System (Wetland) in India of international importance recognized under Ramsar Convention (Iran 1971). The Kolleru lake is located in between Latitudes 16°13' & 16°45' North and Longitudes 81°05' & 81°21' East and is about 35 Km away from the coast i.e. Bay of Bengal. It is formed between the alluvial plains of Godavari and Krishna Rivers due to natural geological formation covering 7 mandals in West Godavari District and 3 mandals in Krishna District of Andhra Pradesh with an extent of 30,855.20Ha (77,138 Acres) upto +5’ contour of the Lake. Several drains from upstream are ending in Kolleru lake and outlet of Kolleru lake is through Upputeru to Bay of Bengal.

2) **Hydrology and drainage:**

Kolleru Lake is spreading over an area of 2,25,000 acres upto +10' contour with rich biodiversity. Water spread area of Kolleru lake is as follows:

Upto +10' contour MSL	2,25,250 acres
Upto +7' Contour MSL	1,68,750 acres
Upto +5' contour MSL	77,138 acres
Upto +3' contour MSL	33,750 acres

Mean Sea Level (MSL)

3) **Catchment Area:**

The total catchment area of Kolleru Lake is 11,90,750 Acres. Out of which, the catchment area in upland area is 8,50,750 Acres and 3,40,000 Acres in delta area. Four streams namely Budameru, Ramileru, Tammileru & Gunderu and drains in Krishna and West Godavari Districts join the lake and the Upputeru drain is the only outlet from Kolleru Lake to the sea i.e., Bay of Bengal.

4) Declared the Kolleru Lake as "Kolleru Wildlife Sanctuary" and also protected area under Wildlife Protection Act, 1972.

The Government of Andhra Pradesh vide G.O.Ms No.120, Environment, Forest, Science and Technology (Forest-III) Department Dt.04.10.1999 under Section 26-A of the Wild Life (Protection) Act, 1972, declared 308.55 Sq.Km (30,855.20 Ha) area as "The Kolleru Wild Life Sanctuary" covering 45 villages in West Godavari District and 29 villages in Krishna District for protection of birds and other wildlife.

B. <u>Action taken by APPCB:</u>

APPCB is not issuing consents/permissions to any industry to discharge treated/untreated effluents to outside the industry premises or to any drains/canals within the radius of 10 KM from +5 contour of Kolleru Wildlife Sanctuary. The Board is also not permitting any new industrial activities within the radius of 10 KM from +5 contour of Kolleru Wildlife Sanctuary. Hence, no pollution due to industrial discharges.

C. Monitoring of water quality of Kolleru Lake and the drains joining into Kolleru Lake by APPCB:

The APPCB has been monitoring the water quality of Kolleru Lake, the drains joining into the Lake and its outlet every month at the following locations in West Godavari District & in Krishna District.

Drain Sampling points:

West Godavari District:

1) West Thammileru.
2) East Thammileru.
3) Bulusu vagu drain.
4) Thokalapalli drain.
5) Pandikodu drain.
6) Kovvali drain.
7) Mondikodu drain.

Krishna District:

8) Chandraiah drain at Gudivada.
9) Budameru drain at Puttagunta.
10) Narasannapalem drain at Arugolanu.
11) Polraj drain at Pillipadu.
12) West Tammileru, Vangayagudem.

Lake sampling points:

West Godavari District:

1) Gudivaka lanka bridge.
2) Kokkiraya lanka bridge.
3) Chettunnapadu bridge.

Krishna District:

4) Pedaedlagadi
5) Chinaedlagadi
6) Kolletikota
7) Circarcanal
8) Srungavarappadu

Outlet of Kolleru Lake:

9) Upputeru at Alapadu bridge, Krishna District.

The samples are tested for physio-chemical and bacteriological parameters. The monitoring results for the period from 2010–2020 are enclosed as **Annexure-I**.

Inference on drain points data:

- The average pH value in all the drains joining into the Kolleru lake are observed to be in the range of 7.03 to 8.20 over the period against the suggested range of 6.5 to 8.5. As per the 'CPCB Primary Water Quality Criteria' for designated best uses of water, water quality is suitable for the propagation of Wildlife and Fisheries.
- The average Dissolved Oxygen (DO) values in the major drains joining into Kolleru lake are observed to be in the range of 3.0 mg/l to 7.0 mg/l over the period. As per the 'CPCB Primary Water Quality Criteria' for designated best uses of water, water quality is suitable for the propagation of Wildlife and Fisheries. The required DO value for propagation of Wildlife and Fisheries is 4.0 mg/l only.

Inference on Lake points data:

- The average pH values in the lake over the period are observed to be in the range from 7.2 to 8.0 as against the suggested range of 6.5 to 8.5 vide 'CPCB Primary Water Quality Criteria' for designated best uses of water, indicating the water is suitable for propagation of Wildlife and Fisheries.
- The average DO values, which were around 2 mg/l earlier (2010 to 2012), is observed to be improved to about 6.0 mg/l during the last 5 years (2015 to 2020) in the Kolleru Lake and its outlet Upputeru which indicates the water quality of the lake is improved. The required DO levels for the propagation of Wildlife and Fisheries in the lake is 4.0 mg/l only as per the 'CPCB Primary Water Quality Criteria' for designated best uses of water.

  The analytical data is compared with CPCB Primary Water Quality Criteria of surface water for designated best use and observed that it falls into Class-D i.e. Propagation of Wildlife and Fisheries, which indicates the water is suitable for propagation of Wildlife and Fisheries.

Pesticides residues in the drains and lake:

In addition, samples are also tested for pesticide residues during the years 2019 and 2020 and observed that pesticide concentrations are below detectable limits except Heptachlor Epoxide which is also below drinking water standards. Copy of the analysis report is enclosed as **Annexure-II**.

D. STP construction by Eluru Municipal Corporation:

Eluru Municipal Corporation is constructing of 5 MLD STP and civil works were completed to 60%.

It is submitted that the Board has further taken the following actions after submitting the action taken report to Hon'ble NGT in OA No.259/2020 on 05.01.2021:

The Board collected drinking water samples of 9 Municipalities (Akiveedu, Bhimavaram, Palakole, Narsapuram, Tadepalligudem, Nidadavole, Jangareddygudem, Tanuku) and 1 Nos of Municipal Corporation (Eluru Municipal Corporation) on 09.01.2021 & 10.01.2021 and analyzed and observed that proper chlorination is required as coliforms are present in the treated water of these Urban Local Bodies (ULBs). Other parameters are meeting the drinking water standards. Analysis reports are enclosed as **Annexure – III.**

As suggested by NEERI, Board conducted Ambient Air Quality Monitoring from 05.02.2021 to 06.02.2021 for Heavy Metals in Eluru city and also collected Surface and Ground water samples in the same locations to ascertain the presence of Mercury and analysis is under progress.

The Board collected the samples of drinking water supplied to the people of Pulla (V) located at a distance of about 25 km from Eluru city, wherein few mysterious disease cases were registered on 19.01.2021. As per the analysis, the samples are meeting the drinking water standards of IS10500:2012. Analysis report enclosed as **Annexure-IV**.

The Government has constituted a Multi–Disciplinary Committee headed by the Chief Secretary to government to investigate the source of episode. The committee recommended continuing the services of AIIMS (All India Institution of Medical Sciences) and IICT (Indian Institute of Chemical Technology) to investigate the source of episode on long-term basis and to suggest remedial measures to prevent re-occurrence of such incidents in future.

The Board has been monitoring the Kolleru lake on regular basis. As per the findings of the analysis of water of drains as well as Lake water, no pesticide residues beyond standards was observed. Further, no industrial discharges are allowed in to Kolleru Lake. The Hon'ble NGT disposed OA No.176 of 2019 on Kolleru Lake pollution on 05.01.2021 with observation that no further orders appears to be necessary. The Hon'ble NGT observed that there is an improvement in the water quality of Kolleru lake waters in respect of pH and Dissolved oxygen (DO) when compared to "CPCB primary water quality criteria for designated best uses of water, indicating the suitability of water in the lake for the propagation of Wildlife and Fisheries, as per the regular monitoring carried out by the Andhra Pradesh Pollution Control Board".

No industrial effluents are joining in to the Kolleru Lake and lake water is not the drinking water source to any village as it falls under Class-D as per CPCB Primary Water Quality criteria and is suitable for propagation of Wild Life & Fisheries only. Further, observed that the convulsion illness cases were registered in the month of December, 2020 in Eluru Town and its surrounding villages only and no cases were registered around the Kolleru lake area.

The above report is placed before the Hon'ble Tribunal for its kind consideration to pass appropriate directions.

JOINT CHIEF ENVIRONMENTAL ENGINEER
AP POLLUTION CONTROL BOARD
ZONAL OFFICE
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Joint Chief Environmental Engineer
A.P.POLLUTION CONTROL BOARD
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Annexure - 1

Mysterious Disease in Eluru, Andhra Pradesh - Hon'ble NGT order dt.18.12.2020 in O.A.No.259 of 2020

Kolleru Lake monitoring results for the period from 2010 – 2020

Annual average values of pH levels of Kolleru Lake from 2010-2020

I	Inlet drains of Kolleru Lake:	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	*Standards Lower limit	*Standards Upper limit
1	West Thammileru	7.80	7.55	7.32	7.53	7.15	---	---	---	---	7.40	7.61	6.0	8.5
2	Budameru drain	7.30	7.36	7.16	7.53	7.23	7.28	7.35	7.31	7.45	7.60	7.19		
3	Chendraiah drain	7.80	7.31	7.26	7.29	7.29	7.27	7.48	7.24	7.32	7.50	7.35		
4	Polaraju drain	7.60	7.46	7.38	7.63	7.63	7.55	7.57	7.64	7.49	7.40	7.52		
5	Narsannapalem drain	7.70	7.53	7.40	7.53	7.47	7.46	7.51	7.07	7.17	7.50	7.51		
6	East Thammileru	8.00	7.47	7.33	7.77	7.42	7.35	7.63	7.34	7.52	7.40	7.23		
7	Bulusu vagu drain	7.70	7.37	7.18	7.47	7.51	7.32	7.47	7.03	7.51	7.50	7.21		
8	Thokalapalli drain	8.10	7.48	7.26	7.68	7.28	7.52	7.61	7.68	7.65	7.60	7.33		
9	Pandikodu drain	7.30	7.28	7.23	7.69	7.23	7.53	7.54	7.29	7.52	7.40	7.17		
10	Kovvali drain	7.20	7.45	7.17	7.56	7.31	7.32	7.43	7.51	7.47	7.40	7.27		
11	Mondikodu drain	7.40	7.22	7.30	7.73	7.29	7.39	7.48	7.48	7.55	7.40	7.27		
II	**Lake Points:**													
1	Pedda edlagadi	8.20	7.45	7.37	7.47	7.43	7.58	7.52	7.21	7.44	7.50	7.47	6.0	8.5
2	Chinna edlagadi	7.90	7.59	7.51	7.52	7.98	7.74	7.42	7.63	7.63	7.60	7.57		
3	Circar canal	7.90	7.49	7.35	7.74	7.41	7.58	7.65	7.61	7.59	7.60	7.50		
4	Srungavarappadu drain	7.60	7.20	7.44	7.63	7.42	7.57	7.65	7.63	7.56	7.60	7.35		
5	Kolleti Kota	7.80	7.39	7.42	7.65	7.47	7.47	7.63	7.57	7.62	7.50	7.51		
6	Gudivaka lanka bridge	8.10	7.33	7.45	7.42	7.32	7.36	7.43	7.13	7.42	7.30	7.12		
7	Kokkiraya lanka bridge	7.90	7.47	7.25	7.63	7.49	7.30	7.44	7.26	7.54	7.30	7.34		
8	Chettunnapadu bridge	7.50	7.34	7.32	7.57	7.37	7.31	7.41	7.42	7.57	7.40	7.28		
III	**Outlet Point:**													
1	Upputeru (outlet)	7.70	7.40	7.44	7.06	7.42	7.63	7.58	7.57	7.51	7.60	7.32	6.0	8.5

***Standard:** CPCB classification for Water Quality Criteria for Designated Best Use.

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SENIOR ENVIRONMENTAL SCIENTIST
A.P.POLLUTION CONTROL BOARD
ZONAL LABORATORY,VIJAYAWADA

Annual average values of Total Dissolved Solids (TDS) of Kolleru Lake from 2010-2020

I	Inlet drains of Kolleru Lake:	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	*Standard	
													Desirable	Upper limit
1	West Thammileru	535	745	1099	698	485	---	---	---	---	622	554	500	2000
2	Budameru drain	635	1005	711	835	1176	731	637	716	950	928	664		
3	Chendraiah drain	475	416	827	865	726	674	730	759	791	828	537		
4	Polaraju drain	1040	765	1489	989	1287	3178	3821	2489	2142	2221	1614		
5	Narsannapalem drain	800	805	147	784	632	905	551	609	789	685	599		
6	East Thammileru	490	365	934	575	568	603	579	395	826	777	599		
7	Bulusu vagu drain	5265	880	1530	1680	1999	2343	2315	2180	1632	1658	1711		
8	Thokalapalli drain	302	215	772	698	771	736	417	296	830	548	383		
9	Pandikodu drain	604	435	831	1517	1191	1062	611	1041	647	894	734		
10	Kovvali drain	902	470	514	589	581	452	445	396	670	650	545		
11	Mondikodu drain	726	310	457	683	743	485	461	344	750	587	675		
II	**Lake Points:**													
1	Pedda edlagadi	1615	920	1116	972	1073	1670	1914	1731	1670	1485	1460	500	2000
2	Chinna edlagadi	640	1025	1775	1211	1176	3210	2792	4576	2159	2715	1844		
3	Circar canal	1000	912	1453	1353	1219	5167	5596	2439	2478	2963	1739		
4	Srungavarappadu drain	1005	630	1500	1357	1304	5349	5481	2320	2203	2199	1533		
5	Kolleti Kota	1005	1220	1417	1375	1256	5624	3770	3717	2060	2754	1641		
6	Gudivaka lanka bridge	1112	740	1358	1383	1688	2193	1634	976	1982	1853	1414		
7	Kokkiraya lanka bridge	726	1135	1347	1360	1781	3864	1082	2018	1907	2691	1463		
8	Chettunnapadu bridge	955	595	917	910	1599	3430	1889	1474	975	2344	1405		
III	**Outlet Point:**													
1	Upputeru (outlet)	1000	960	3509	2831	1443	4468	5808	2062	2179	1542	1733	500	2000

Note: All values are expressed in mg/lit

*** Standard:** IS 10500-2012; drinking water standards.

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SENIOR ENVIRONMENTAL SCIENTIST
A.P.POLLUTION CONTROL BOARD
ZONAL LABORATORY,VIJAYAWADA

Annual average values of Dissolved Oxygen (DO) of Kolleru Lake from 2010-2020

I	Inlet drains of Kolleru Lake:	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	*Standard		
													Class A	Class B	Class C
1	West Thammileru	1.1	4.6	3.8	5.6	2.6	---	---	---	---	5.7	5.5	6.0	5.0	4.0
2	Budameru drain	2.6	2.9	2.6	2.0	3.8	3.7	6.6	6.8	6.0	5.6	5.6			
3	Chendraiah drain	1.8	2.8	2.3	2.0	1.8	4.0	6.5	6.8	5.8	5.7	5.6			
4	Polaraju drain	1.6	2.4	1.9	3.5	4.8	6.9	6.5	7.1	6.0	5.8	5.6			
5	Narsannapalem drain	4.1	2.8	3.3	1.9	3.1	4.6	6.7	6.8	6.0	5.8	5.6			
6	East Thammileru	3.2	6.8	4.8	6.1	4.9	5.6	6.7	7.0	5.8	5.8	5.6			
7	Bulusu vagu drain	5.8	5.7	5.0	4.4	3.6	6.7	6.7	7.3	5.8	5.8	5.6			
8	Thokalapalli drain	8.6	3.8	4.9	5.3	5.1	7.5	6.8	6.8	5.8	5.7	5.7			
9	Pandikodu drain	3.8	3.5	3.7	4.5	3.6	4.3	6.2	7.1	6.0	5.7	5.6			
10	Kovvali drain	7.2	1.6	5.3	5.6	4.8	6.1	6.8	7.1	5.8	5.9	5.7			
11	Mondikodu drain	6.1	5.0	4.3	6.2	4.1	6.4	6.8	6.9	5.8	5.9	5.6			
II	**Lake Points:**														
1	Pedda edlagadi	0.6	2.8	2.7	4.2	2.9	4.6	6.9	7.0	5.9	5.7	5.0	6.0	5.0	4.0
2	Chinna edlagadi	0.8	2.0	2.2	1.1	1.3	5.0	5.8	6.7	5.8	5.7	5.6			
3	Circar canal	3.2	2.5	2.8	3.5	4.3	5.8	7.0	6.9	6.1	5.8	5.5			
4	Srungavarappadu drain	2.1	2.1	2.8	2.9	4.0	5.6	6.4	6.9	6.0	5.8	5.6			
5	Kolleti Kota	2.4	2.3	2.8	3.6	4.0	4.4	6.5	6.8	6.1	5.8	5.6			
6	Gudivaka lanka bridge	0.8	2.8	2.3	2.8	2.4	4.4	6.8	7.1	6.0	5.9	5.5			
7	Kokkiraya lanka bridge	2.2	2.4	1.8	2.5	3.0	4.2	6.4	7.0	5.9	5.9	5.9			
8	Chettunnapadu bridge	0.2	2.2	1.9	1.6	1.8	5.9	6.4	7.0	5.9	5.8	5.7			
III	**Outlet Point:**														
1	Upputeru (outlet)	3.1	2.4	2.4	3.3	3.8	5.8	6.6	7.0	6.0	5.2	5.6	6.0	5.0	4.0

Note: All values are expressed in mg/lit.

***Standard:** CPCB classification for Water Quality Criteria for Designated Best Use.

K Seeniwoy

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Annual average values of Chemical Oxygen Demand of Kolleru Lake from 2010-2020											
I	**Inlet drains of Kolleru Lake:**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
1	West Thammileru	51	42	27	19	24	---	---	---	---	19	12
2	Budameru drain	31	20	28	21	26	33	20	26	28	24	14
3	Chendraiah drain	38	28	25	22	21	35	28	20	25	17	14
4	Polaraju drain	36	40	26	21	28	105	50	35	28	30	19
5	Narsannapalem drain	24	28	26	20	21	41	17	21	22	15	15
6	East Thammileru	23	16	25	20	19	21	18	15	24	20	13
7	Bulusu vagu drain	68	32	27	29	33	49	32	29	30	28	17
8	Thokalapalli drain	18	36	23	16	21	24	14	13	19	18	10
9	Pandikodu drain	21	20	32	27	27	43	18	19	21	20	12
10	Kovvali drain	36	28	28	18	19	20	15	13	24	22	15
11	Mondikodu drain	42	36	30	19	20	20	20	14	20	19	13
II	**Lake Points:**											
1	Pedda edlagadi	26	36	27	24	29	54	42	29	56	22	19
2	Chinna edlagadi	38	24	33	24	31	90	35	45	27	28	19
3	Circar canal	54	28	25	25	27	311	53	37	26	31	17
4	Srungavarappadu drain	45	40	26	24	30	111	52	32	27	29	17
5	Kolleti Kota	56	32	29	25	27	113	47	36	23	32	16
6	Gudivaka lanka bridge	65	32	27	30	27	80	36	19	28	24	16
7	Kokkiraya lanka bridge	74	48	23	27	30	140	19	25	25	32	19
8	Chettunnapadu bridge	72	28	26	23	28	103	35	27	26	29	17
III	**Outlet Point:**											
1	Upputeru (outlet)	36	32	27	28	34	51	43	28	26	32	16

Note: All vaues are expressed in mg/lit.

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A.P.POLLUTION CONTROL BOARD
ZONAL LABORATORY,VIJAYAWADA

Annual average values of Bio-chemical Oxygen Demand (BOD) of Kolleru Lake from 2010-2020

I	Inlet drains of Kolleru Lake:	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	*Standard	
													Class A	Class B & C
1	West Thammileru	6.1	0.7	1.7	1.8	3.9	---	---	---	---	3.5	12.0	2.0	3.0
2	Budameru drain	6.5	1.2	1.7	2.9	2.9	6.0	4.2	3.1	5.8	4.3	1.4		
3	Chendraiah drain	7.2	1.1	1.4	3.4	3.8	4.9	4.7	2.4	5.4	1.7	1.5		
4	Polaraju drain	6.8	1.0	1.8	2.6	2.6	21.9	12.3	4.0	5.6	4.6	2.0		
5	Narsannapalem drain	5.8	1.1	1.8	3.4	3.2	5.4	2.7	3.0	4.5	2.1	1.5		
6	East Thammileru	5.6	0.8	1.7	1.5	2.1	3.4	3.8	2.1	5.0	3.7	1.5		
7	Bulusu vagu drain	7.0	0.9	1.7	3.0	2.7	7.3	8.0	3.8	6.5	4.6	1.8		
8	Thokalapalli drain	2.2	0.8	1.5	1.4	1.8	4.4	3.1	1.9	3.9	3.3	2.6		
9	Pandikodu drain	6.8	1.2	2.3	2.8	2.7	7.6	4.4	2.5	4.6	3.3	1.3		
10	Kovvali drain	3.2	1.1	2.0	1.7	2.1	2.8	3.4	1.8	5.1	4.0	1.3		
11	Mondikodu drain	2.8	0.8	2.0	1.4	2.5	3.1	3.8	1.9	4.2	3.6	1.3		
II	**Lake Points:**													
1	Pedda edlagadi	5.6	1.1	1.5	2.6	3.9	8.8	7.9	3.9	5.6	3.4	1.8	2.0	3.0
2	Chinna edlagadi	7.9	1.2	2.1	4.1	4.5	9.1	7.4	5.7	5.9	4.1	2.1		
3	Circar canal	11.0	1.2	1.5	2.9	2.9	20.1	12.4	4.2	5.0	4.2	1.7		
4	Srungavarappadu drain	10.6	1.1	1.8	3.2	2.7	19.0	12.2	3.7	5.7	4.5	1.7		
5	Kolleti Kota	11.2	1.1	1.8	2.9	3.1	19.4	11.8	4.1	4.1	4.3	1.7		
6	Gudivaka lanka bridge	10.8	1.1	1.6	3.8	3.9	12.7	8.9	2.6	5.0	4.4	2.2		
7	Kokkiraya lanka bridge	11.8	1.0	1.4	3.5	3.7	19.9	5.2	3.3	5.3	5.1	2.1		
8	Chettunnapadu bridge	13.0	1.2	1.7	4.0	4.1	17.1	7.1	3.4	5.5	4.3	1.8		
III	**Outlet Point:**													
1	Upputeru (outlet)	6.6	1.2	1.9	3.2	2.9	8.6	11.2	3.2	5.2	4.3	1.9	2.0	3.0

***Standard:** CPCB classification for Water Quality Criteria for Designated Best Use.

Note: All values are expressed in mg/lit.

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Annual average values of Nitrate of Kolleru Lake from 2010-2020

I	Inlet drains of Kolleru Lake:	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	* Standard
1	West Thammileru	0.08	0.15	1.17	0.52	0.75	---	---	---	---	---	2.03	10
2	Budameru drain	0.31	0.80	1.12	0.68	0.78	1.07	1.70	3.22	3.21	---	2.91	
3	Chendraiah drain	0.10	0.39	0.96	0.66	0.73	1.65	1.34	2.92	2.59	---	1.82	
4	Polaraju drain	0.01	0.27	1.11	0.67	0.59	1.97	3.11	2.75	2.67	---	2.30	
5	Narsannapalem drain	0.12	0.37	1.07	0.67	0.67	1.20	1.86	1.99	2.08	---	2.00	
6	East Thammileru	0.15	0.27	1.17	0.52	0.57	1.90	1.80	1.10	3.06	---	2.16	
7	Bulusu vagu drain	0.03	0.26	1.24	0.65	0.62	1.76	2.75	2.53	2.25	---	2.25	
8	Thokalapalli drain	0.05	0.22	1.37	0.51	0.64	1.26	0.82	1.27	1.31	---	1.64	
9	Pandikodu drain	0.16	0.19	1.57	0.67	0.62	1.10	0.80	1.18	1.40	---	2.28	
10	Kovvali drain	0.15	0.37	1.58	0.49	0.57	1.24	0.64	1.04	1.53	---	1.80	
11	Mondikodu drain	0.12	0.31	1.32	0.53	0.51	1.39	0.75	1.11	2.00	---	1.63	
II	**Lake Points:**												
1	Pedda edlagadi	0.10	0.12	1.37	0.70	0.81	1.27	2.67	1.96	3.21	---	2.28	10
2	Chinna edlagadi	0.12	0.17	1.03	0.74	0.77	1.43	2.83	3.35	3.60	---	2.32	
3	Circar canal	0.01	0.16	0.96	0.69	0.73	1.47	4.43	3.07	2.93	---	2.01	
4	Srungavarappadu drain	0.02	0.18	0.89	0.73	0.74	1.04	3.66	2.75	2.79	---	2.10	
5	Kolleti Kota	0.01	0.24	0.89	0.61	0.73	1.42	2.56	2.78	2.81	---	2.14	
6	Gudivaka lanka bridge	0.03	0.21	1.33	0.69	0.84	1.50	0.92	1.95	2.12	---	1.87	
7	Kokkiraya lanka bridge	0.04	0.51	1.22	0.68	0.85	2.73	1.09	1.75	3.36	---	2.69	
8	Chettunnapadu bridge	0.06	0.23	1.16	0.65	0.85	11.09	3.77	2.39	3.20	---	3.00	
III	**Outlet Point:**												
1	Upputeru (outlet)	0.01	0.14	1.14	0.65	0.71	1.97	2.56	2.10	2.18	---	2.25	10

*** Standard:** IS 10500-2012; drinking water standards.

Note: All values are expressed in mg/lit.

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Annaul average values of Phosphates of Kolleru Lake from 2010-2020

I	Inlet drains of Kolleru Lake:	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	West Thammileru	3.23	1.16	0.90	0.76	2.88	---	---	---	---	---	0.69
2	Budameru drain	2.00	1.82	0.99	1.75	1.72	0.44	0.14	0.15	0.76	---	0.97
3	Chendraiah drain	10.13	0.76	1.27	1.44	2.26	0.90	0.36	0.03	0.60	---	0.47
4	Polaraju drain	1.61	1.85	0.33	1.83	1.84	0.98	0.52	0.13	1.28	---	1.12
5	Narsannapalem drain	2.14	1.24	0.68	1.66	1.52	0.91	0.03	0.22	1.64	---	0.57
6	East Thammileru	1.71	1.34	0.25	0.57	0.97	0.66	0.24	0.33	0.52	---	0.73
7	Bulusu vagu drain	1.13	0.65	0.46	1.23	1.66	0.90	0.05	0.07	0.98	---	0.52
8	Thokalapalli drain	0.96	1.16	0.53	0.87	1.07	0.58	0.04	0.04	----	---	0.17
9	Pandikodu drain	2.66	0.86	0.53	0.94	1.21	0.48	0.32	0.11	0.26	---	0.40
10	Kovvali drain	3.38	0.76	0.54	0.63	1.27	0.29	0.04	0.08	0.25	---	0.43
11	Mondikodu drain	0.42	0.82	0.40	0.62	1.11	0.38	0.05	0.04	0.14	---	0.47
II	**Lake Points:**											
1	Pedda edlagadi	5.60	1.18	0.68	0.92	2.31	0.68	0.46	0.07	1.03	---	1.29
2	Chinna edlagadi	3.12	4.80	0.79	2.41	2.53	1.39	0.66	0.32	1.78	---	1.30
3	Circar canal	5.11	2.38	1.77	1.55	1.87	0.74	0.87	0.10	0.57	---	1.12
4	Srungavarappadu drain	4.62	2.48	1.55	1.45	2.09	0.61	0.71	0.13	0.87	---	0.95
5	Kolleti Kota	5.20	2.26	0.82	1.51	2.12	0.76	1.02	0.02	0.60	---	0.93
6	Gudivaka lanka bridge	3.19	0.12	0.54	1.58	2.53	1.34	0.05	0.04	0.46	---	0.60
7	Kokkirava lanka bridge	4.84	1.46	0.44	1.56	2.50	1.35	0.09	0.06	0.37	---	0.92
8	Chettunnapadu bridge	3.05	1.28	0.58	1.76	2.82	1.14	0.83	0.05	0.73	---	1.07
III	**Outlet Point:**											
1	Upputeru (outlet)	4.34	1.35	0.92	1.56	2.18	1.34	0.55	0.07	0.58	---	1.13

Note: All values are expressed in mg/lit.

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Annual average values of Total Coliform of Kolleru Lake from 2010-2020

I	Inlet drains of Kolleru Lake:	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	*Standard		
													Class A	Class B	Class C
1	West Thammileru	2700	2600	2550	2450	1200	---	---	---	---	1377	460	50	500	5000
2	Budameru drain	2700	2700	2450	2650	1438	----	----	----	----	1243	654			
3	Chendraiah drain	2200	2600	2300	2500	1213	----	----	----	----	1090	837			
4	Polaraju drain	2700	3300	2600	2800	1771	----	----	----	----	1172	931			
5	Narsannapalem drain	2200	2600	2200	2400	1229	----	----	----	----	1096	1123			
6	East Thammileru	1400	2200	2100	2000	963	----	----	----	----	1218	915			
7	Bulusu vagu drain	1300	1400	1500	1600	2163	----	----	----	----	1173	966			
8	Thokalapalli drain	1400	1700	1800	1700	1150	----	----	----	----	1232	808			
9	Pandikodu drain	2200	1400	1502	1450	1438	----	----	----	----	1242	1088			
10	Kovvali drain	1100	1700	1750	1680	1025	----	----	----	----	1207	909			
11	Mondikodu drain	1700	1200	1250	1150	1063	----	----	----	----	1109	1121			
II	**Lake Points:**														
1	Pedda edlagadi	3300	2700	2800	2500	1471	----	----	----	----	1148	1064	50	500	5000
2	Chinna edlagadi	2700	3400	3500	3200	1388	----	----	----	----	965	964			
3	Circar canal	2100	2700	2750	2800	1838	----	----	----	----	995	972			
4	Srungavarappadu drain	2600	2600	2650	2700	1788	----	----	----	----	1083	901			
5	Kolleti Kota	3000	3400	3500	3600	1775	----	----	----	----	935	884			
6	Gudivaka lanka bridge	1700	1400	1800	1500	2063	----	----	----	----	1250	959			
7	Kokkiraya lanka bridge	1400	1200	1300	1250	1850	----	----	----	----	1160	1226			
8	Chettunnapadu bridge	2100	1200	1500	1300	1738	----	----	----	----	922	885			
III	**Outlet Point:**														
1	Upputeru (outlet)	3000	2600	2700	2800	2075	----	----	----	----	1224	1163	50	500	5000

***Standard:** CPCB classification for Water Quality Criteria for Designated Best Use.

Note: All values are expressed in MPN/100 ML.

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ANALYSIS REPORT

Sample No. : **2019 – 12 – W – 115 to 120**

Sample location/Address : Kolleru Lake samples, West Godavari District

Sample Source : W- 115: West Tammileru Upstream of Bridge
W- 116: West Tammileru Bridge
W- 117: West Tammileru Downstream of Bridge
W- 118: Gudivakalanka Upstream of Bridge
W- 119: Gudivakalanka Bridge
W- 120: Gudivakalanka Downstream of Bridge

Sample collected on : 11.12.2019

Sample submitted on : 12.12.2019

Sample collected by : Analyst (OS), Regional Office, Eluru

No	Parameters	W-115	W-116	W-117	W-118	W-119	W-120
1.	Alpha – BHC	BDL	BDL	BDL	BDL	BDL	BDL
2.	Beta– BHC	BDL	BDL	BDL	BDL	BDL	BDL
3.	Gamma – BHC	BDL	BDL	BDL	BDL	BDL	BDL
4.	4,4' – ODD	BDL	BDL	BDL	BDL	BDL	BDL
5.	4,4' – DDE	BDL	BDL	BDL	BDL	BDL	BDL
6.	4,4' – DDT	BDL	BDL	BDL	BDL	BDL	BDL
7.	Aldrin	BDL	BDL	BDL	BDL	BDL	BDL
8.	Dieldrin	BDL	BDL	BDL	BDL	BDL	BDL
9.	Endosulfan – I	BDL	BDL	BDL	BDL	BDL	BDL
10.	Endosulfan Sulfate	BDL	BDL	BDL	BDL	BDL	BDL
11.	Endrin	BDL	BDL	BDL	BDL	BDL	BDL
12.	Heptachlor	BDL	BDL	BDL	BDL	BDL	BDL
13.	Heptachlorapoxide	BDL	BDL	BDL	BDL	BDL	BDL
14.	Methoxychlor	BDL	BDL	BDL	BDL	BDL	BDL
15.	Endosulfan – II	BDL	BDL	BDL	BDL	BDL	BDL
16.	Delta – BHC	BDL	BDL	BDL	BDL	BDL	BDL
17.	Endrin Aldehyde	BDL	BDL	BDL	BDL	BDL	BDL

Note: - BDL: Below Detectable Limit (< 0.01 ppb)

M. Ravi

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16

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ANALYSIS REPORT

Sample No.	:	**2020 – 10 – W – 107 to 116**
Sample location/Address	:	Kolleru Lake water samples, West Godavari District.
Sample Source	:	W-107: Gudivakalanaka
		W-108: Kokkirayalanaka
		W-109: Chettunnapadu
		W-110: Bulusuvagu
		W-111: Tokalapalli drain
		W-112: Pandikodu drain
		W-113: Mondikodu
		W-114: Kovvali drain
		W-115: East Tammileru
		W-116: West Tammileru
Sample collected on	:	08.10.2020
Sample submitted on	:	09.10.2020
Sample collected by	:	Analyst (OS), Regional Office, Eluru

S.No.	Parameter	W 107	W 108	W 109	W 110	W 111	W 112	W 113	W 114	W 115	W 116	Drinking Water Specification IS: 10500:2012
1.	Alpha – BHC	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.01
2.	Beta– BHC	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.04
3.	Gamma – BHC	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2.0
4.	4,4' – DDD	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.0
5.	4,4' – DDE	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.0
6.	4,4' – DDT	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.01	1.0
7.	Aldrin	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.03
8.	Dieldrin	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.03
9.	Endosulfan – I	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.4
10.	Endosulfan Sulfate	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	--
11.	Endrin	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	--
12.	Heptachlor	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	--
13.	Heptachlorepoxide	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.017	BDL	0.016	--
14.	Methoxychlor	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	--
15.	Endosulfan – II	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.4
16.	Delta – BHC	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.04
17.	Endrin Aldehyde	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	--

Note: - All values are expressed in µg/l
BDL: Below Detectable Limit (< 0.01 µg/l)

M Rani 4/4/20

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Water & Waste Water Test Report

Report No	2101W015	**Report Date**	12.02.2021
Sample code	Y2101164 & 165	**Test Completion Date**	22.01.2021
Sample Collected date	09.01.2021	**Sample Received Date**	11.01.2021
Sample Collected by	Project Analyst, RO - Eluru.		
Name & Address of the Customer	Environmental Engineer, RO – Eluru.		
Sample Reference	Samples collected from various ULBs.		
Description of Sample	Y2101164 – Inlet of water treatment plant-1(8 MLD) of Eluru Municipal Corporation (Source: Raw water from Eluru canal from Godavari River). Y2101165 – Outlet of water treatment plant-1(8 MLD) of Eluru Municipal Corporation.		

S.No	Parameter (s) / Name of Test	Test Method	Units	Sample Code		IS 10500:2012 Standard
				Y2101 164	Y2101 165	
1	pH	APHA (23rd Edition) 4500 – H+B:2017	pH Units	7.16	7.04	6.5 - 8.5
2	Electrical Conductivity	APHA (23rd Edition) 2510-B: 2017	µS/cm	350	349	1000
3	Total Suspended Solids	APHA (23rd Edition) 2540-D: 2017	mg/L	BDL	BDL	Absent
4	Total Dissolved Solids	APHA (23rd Edition) 2540 – C:2017	mg/L	224	218	500
5	Chemical Oxygen Demand (COD)	APHA (23rd Edition) 5220-B: 2017	mg/L	BDL	BDL	Absent
6	Biochemical Oxygen Demand (BOD) For 3days @ 27°C	IS 3025 (Part 44): 1993	mg/L	BDL	BDL	Absent
7	Dissolved Oxygen	APHA (23rd Edition) 4500-OC: 2017	mg/L	6.5	6.6	.....
8	Alkalinity	APHA (23rd Edition) 2320-B: 2017	mg/L	100	94	200
9	Total Hardness	APHA (23rd Edition) 2340-C: 2017	mg/L	120	108	200
10	Calcium (Ca2+)	APHA (23rd Edition) 3500-Ca B: 2017	mg/L	32	29	75
11	Magnesium (Mg2+)	APHA (23rd Edition) 3500-Mg B: 2017	mg/L	10	9	30
12	Nitrates as NO_3-N	APHA (23rd Edition) 4500-NO_3-B: 2017	mg/L	0.76	0.42	10
13	Fluoride	APHA (23rd Edition) 4500-F & D: 2017,	mg/L	0.48	0.36	1
14	Total Coliform	APHA (23rd Edition) 9221-B : 2017	MPN/ 100ml	150	75	Shall not be detectable in any 100ml sample
15	Fecal Coliform	APHA (23rd Edition) 9221-E : 2017	MPN/ 100ml	<3	<3	Shall not be detectable in any 100ml sample
16	Ammonical Nitrogen (NH_3-N)	APHA (23rd Edition) 4500-NH_3-C: 2017	mg/L	BDL	BDL	0.5
17	Chlorine (Residual)	APHA (23rd Edition) 4500-Cl-B: 2017	mg/L	BDL	BDL	0.2

BDL – Below Detectable Limit.

Note:

- The contents of the report shall not be reproduced either in full or in part without prior written consent of the issuing authority.
- The results relate only to the items tested.

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Water & Waste Water Test Report

Report No	2101W016	**Report Date**	12.02.2021
Sample code	Y2101166 & 167	**Test Completion Date**	22.01.2021
Sample Collected date	09.01.2021	**Sample Received Date**	11.01.2021
Sample Collected by	Project Analyst, RO - Eluru.		
Name & Address of the Customer	Environmental Engineer, RO – Eluru.		
Sample Reference	Samples collected from various ULBs.		
Description of Sample	Y2101166 – Inlet of water treatment plant-2(30 MLD) of Eluru Municipal Corporation (Source: Raw water from Eluru canal from Godavari River). Y2101167 – Outlet of water treatment plant-2(30 MLD) of Eluru Municipal Corporation.		

S.No	Parameter (s) / Name of Test	Test Method	Units	Sample Code		IS 10500:2012 Standard
				Y2101 166	Y2101 167	
1	pH	APHA (23rd Edition) 4500 – H+B:2017	pH Units	7.50	7.32	6.5 - 8.5
2	Electrical Conductivity	APHA (23rd Edition) 2510-B: 2017	µS/cm	340	330	1000
3	Total Suspended Solids	APHA (23rd Edition) 2540-D: 2017	mg/L	BDL	BDL	Absent
4	Total Dissolved Solids	APHA (23rd Edition) 2540 – C:2017	mg/L	220	208	500
5	Chemical Oxygen Demand	APHA (23rd Edition) 5220-B: 2017	mg/L	BDL	BDL	Absent
6	Biochemical Oxygen Demand (BOD) For 3days @ 27˚C	IS 3025 (Part 44): 1993	mg/L	BDL	BDL	Absent
7	Dissolved Oxygen	APHA (23rd Edition) 4500-OC: 2017	mg/L	6.7	6.3	.....
8	Alkalinity	APHA (23rd Edition) 2320-B: 2017	mg/L	102	96	200
9	Total Hardness	APHA (23rd Edition) 2340-C: 2017	mg/L	144	140	200
10	Calcium (Ca2+)	APHA (23rd Edition) 3500-Ca B: 2017	mg/L	30	29	75
11	Magnesium (Mg2+)	APHA (23rd Edition) 3500-Mg B: 2017	mg/L	17	17	30
12	Nitrates as NO_3-N	APHA (23rd Edition) 4500-NO_3-B: 2017	mg/L	0.69	0.46	10
13	Fluoride	APHA (23rd Edition) 4500-F & D: 2017,	mg/L	0.51	0.42	1
14	Total Coliform	APHA (23rd Edition) 9221-B : 2017	MPN/ 100ml	120	64	Shall not be detectable in any 100ml sample
15	Fecal Coliform	APHA (23rd Edition) 9221-E : 2017	MPN/ 100ml	<3	<3	Shall not be detectable in any 100ml sample
16	Ammonical Nitrogen (NH_3-N)	APHA (23rd Edition) 4500-NH_3-C: 2017	mg/L	BDL	BDL	0.5
17	Chlorine (Residual)	APHA (23rd Edition) 4500-Cl-B: 2017	mg/L	BDL	BDL	0.2

BDL – Below Detectable Limit.

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Water & Waste Water Test Report

Report No	2101W017	**Report Date**	12.02.2021
Sample code	Y2101168 & 169	**Test Completion Date**	22.01.2021
Sample Collected date	09.01.2021	**Sample Received Date**	11.01.2021
Sample Collected by	Project Analyst, RO - Eluru.		
Name & Address of the Customer	Environmental Engineer, RO – Eluru.		
Sample Reference	Samples collected from various ULBs.		
Description of Sample	Y2101168 – Inlet of water treatment plant of Bhimavaram Municipality (Source: Raw water from Gostanadi & Velpuru canal from Godavari River). Y2101169 – Outlet of water treatment plant of Bhimavaram Municipality.		

S.No	Parameter (s) / Name of Test	Test Method	Units	Sample Code		IS 10500:2012 Standard
				Y2101 168	Y2101 169	
1	pH	APHA (23rd Edition) 4500 – H+B:2017	pH Units	7.46	7.10	6.5 - 8.5
2	Electrical Conductivity	APHA (23rd Edition) 2510-B: 2017	µS/cm	342	399	1000
3	Total Suspended Solids	APHA (23rd Edition) 2540-D: 2017	mg/L	BDL	BDL	Absent
4	Total Dissolved Solids	APHA (23rd Edition) 2540 – C:2017	mg/L	216	248	500
5	Chemical Oxygen Demand	APHA (23rd Edition) 5220-B: 2017	mg/L	BDL	BDL	Absent
6	Biochemical Oxygen Demand (BOD) For 3days @ 27 ° C	IS 3025 (Part 44): 1993	mg/L	BDL	BDL	Absent
7	Dissolved Oxygen	APHA (23rd Edition) 4500-OC: 2017	mg/L	4.1	5.7	.....
8	Alkalinity	APHA (23rd Edition) 2320-B: 2017	mg/L	104	102	200
9	Total Hardness	APHA (23rd Edition) 2340-C: 2017	mg/L	116	128	200
10	Calcium (Ca2+)	APHA (23rd Edition) 3500-Ca B: 2017	mg/L	26	30	75
11	Magnesium (Mg2+)	APHA (23rd Edition) 3500-Mg B: 2017	mg/L	13	13	30
12	Nitrates as NO_3-N	APHA (23rd Edition) 4500-NO_3-B: 2017	mg/L	0.12	0.50	10
13	Fluoride	APHA (23rd Edition) 4500-F & D: 2017,	mg/L	0.34	0.41	1
14	Total Coliform	APHA (23rd Edition) 9221-B : 2017	MPN/ 100ml	150	89	Shall not be detectable in any 100ml sample
15	Fecal Coliform	APHA (23rd Edition) 9221-E : 2017	MPN/ 100ml	<3	<3	Shall not be detectable in any 100ml sample
16	Ammonical Nitrogen (NH_3-N)	APHA (23rd Edition) 4500-NH_3-C: 2017	mg/L	BDL	BDL	0.5
17	Chlorine (Residual)	APHA (23rd Edition) 4500-Cl-B: 2017	mg/L	BDL	BDL	0.2

BDL – Below Detectable Limit.

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Water & Waste Water Test Report

Report No	2101W018	**Report Date**	12.02.2021
Sample code	Y2101170 & 171	**Test Completion Date**	22.01.2021
Sample Collected date	09.01.2021	**Sample Received Date**	11.01.2021
Sample Collected by	Project Analyst, RO - Eluru.		
Name & Address of the Customer	Environmental Engineer, RO – Eluru.		
Sample Reference	Samples collected from various ULBs.		
Description of Sample	Y2101170 – Inlet of water treatment plant of Palakole Municipality (Source: Raw water from Nidadavole-Mogalturu canal from Godavari River). Y2101171 – Outlet of water treatment plant of Palakole Municipality.		

S.No	Parameter (s) / Name of Test	Test Method	Units	Sample Code		IS 10500:2012 Standard
				Y2101 170	Y2101 171	
1	pH	APHA (23rd Edition) 4500 – H+B:2017	pH Units	7.38	7.31	6.5 - 8.5
2	Electrical Conductivity	APHA (23rd Edition) 2510-B: 2017	µS/cm	246	207	1000
3	Total Suspended Solids	APHA (23rd Edition) 2540-D: 2017	mg/L	BDL	BDL	Absent
4	Total Dissolved Solids	APHA (23rd Edition) 2540 – C:2017	mg/L	156	130	500
5	Chemical Oxygen Demand	APHA (23rd Edition) 5220-B: 2017	mg/L	BDL	BDL	Absent
6	Biochemical Oxygen Demand (BOD) For 3days @ 27°C	IS 3025 (Part 44): 1993	mg/L	BDL	BDL	Absent
7	Dissolved Oxygen	APHA (23rd Edition) 4500-OC: 2017	mg/L	6.6	6.3	.....
8	Alkalinity	APHA (23rd Edition) 2320-B: 2017	mg/L	94	92	200
9	Total Hardness	APHA (23rd Edition) 2340-C: 2017	mg/L	116	92	200
10	Calcium (Ca2+)	APHA (23rd Edition) 3500-Ca B: 2017	mg/L	22	18	75
11	Magnesium (Mg2+)	APHA (23rd Edition) 3500-Mg B: 2017	mg/L	15	12	30
12	Nitrates as NO_3-N	APHA (23rd Edition) 4500-NO_3-B: 2017	mg/L	0.49	0.34	10
13	Fluoride	APHA (23rd Edition) 4500-F & D: 2017,	mg/L	0.54	0.38	1
14	Total Coliform	APHA (23rd Edition) 9221-B : 2017	MPN/ 100ml	150	75	Shall not be detectable in any 100ml sample
15	Fecal Coliform	APHA (23rd Edition) 9221-E : 2017	MPN/ 100ml	<3	<3	Shall not be detectable in any 100ml sample
16	Ammonical Nitrogen (NH_3-N)	APHA (23rd Edition) 4500-NH_3-C: 2017	mg/L	BDL	BDL	0.5
17	Chlorine (Residual)	APHA (23rd Edition) 4500-Cl-B: 2017	mg/L	BDL	BDL	0.2

BDL – Below Detectable Limit.

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Water & Waste Water Test Report

Report No	2101W019	**Report Date**	12.02.2021
Sample code	Y2101172 & 173	**Test Completion Date**	22.01.2021
Sample Collected date	09.01.2021	**Sample Received Date**	11.01.2021
Sample Collected by	Project Analyst, RO - Eluru.		
Name & Address of the Customer	Environmental Engineer, RO – Eluru.		
Sample Reference	Samples collected from various ULBs.		
Description of Sample	Y2101172 – Inlet of water treatment plant of Narasapuram Municipality (Source: Raw water from Narasapuram canal from Godavari River). Y2101173 – Outlet of water treatment plant of Narasapuram Municipality.		

S.No	Parameter (s) / Name of Test	Test Method	Units	Sample Code		IS 10500:2012 Standard
				Y2101172	Y2101173	
1	pH	APHA (23rd Edition) 4500 – H+B:2017	pH Units	7.22	7.20	6.5 - 8.5
2	Electrical Conductivity	APHA (23rd Edition) 2510-B: 2017	µS/cm	281	274	1000
3	Total Suspended Solids	APHA (23rd Edition) 2540-D: 2017	mg/L	BDL	BDL	Absent
4	Total Dissolved Solids	APHA (23rd Edition) 2540 – C:2017	mg/L	177	170	500
5	Chemical Oxygen Demand	APHA (23rd Edition) 5220-B: 2017	mg/L	BDL	BDL	Absent
6	Biochemical Oxygen Demand (BOD) For 3days @ 27° C	IS 3025 (Part 44): 1993	mg/L	BDL	BDL	Absent
7	Dissolved Oxygen	APHA (23rd Edition) 4500-OC: 2017	mg/L	7.8	7.4	.....
8	Alkalinity	APHA (23rd Edition) 2320-B: 2017	mg/L	100	74	200
9	Total Hardness	APHA (23rd Edition) 2340-C: 2017	mg/L	108	104	200
10	Calcium (Ca2+)	APHA (23rd Edition) 3500-Ca B: 2017	mg/L	29	21	75
11	Magnesium (Mg2+)	APHA (23rd Edition) 3500-Mg B: 2017	mg/L	13	9	30
12	Nitrates as NO_3-N	APHA (23rd Edition) 4500-NO_3-B: 2017	mg/L	0.71	0.22	10
13	Fluoride	APHA (23rd Edition) 4500-F & D: 2017,	mg/L	0.37	0.37	1
14	Total Coliform	APHA (23rd Edition) 9221-B : 2017	MPN/ 100ml	120	89	Shall not be detectable in any 100ml sample
15	Fecal Coliform	APHA (23rd Edition) 9221-E : 2017	MPN/ 100ml	<3	<3	Shall not be detectable in any 100ml sample
16	Ammonical Nitrogen (NH_3-N)	APHA (23rd Edition) 4500-NH_3-C: 2017	mg/L	BDL	BDL	0.5
17	Chlorine (Residual)	APHA (23rd Edition) 4500-Cl-B: 2017	mg/L	BDL	BDL	0.2

BDL – Below Detectable Limit.

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Water & Waste Water Test Report

Report No	2101W020	**Report Date**	12.02.2021
Sample code	Y2101174 & 175	**Test Completion Date**	22.01.2021
Sample Collected date	09.01.2021	**Sample Received Date**	11.01.2021
Sample Collected by	Project Analyst, RO - Eluru.		
Name & Address of the Customer	Environmental Engineer, RO – Eluru.		
Sample Reference	Samples collected from various ULBs.		
Description of Sample	Y2101174 – Inlet of water treatment plant of Tanuku Municipality (Source: Raw water from Gostanadi & Velpuru canal from Godavari River). Y2101175 – Outlet of water treatment plant of Tanuku Municipality.		

S.No	Parameter (s) / Name of Test	Test Method	Units	Sample Code		IS 10500:2012 Standard
				Y2101 174	Y2101 175	
1	pH	APHA (23rd Edition) 4500 – H+B:2017	pH Units	7.10	7.08	6.5 - 8.5
2	Electrical Conductivity	APHA (23rd Edition) 2510-B: 2017	µS/cm	199	190	1000
3	Total Suspended Solids	APHA (23rd Edition) 2540-D: 2017	mg/L	BDL	BDL	Absent
4	Total Dissolved Solids	APHA (23rd Edition) 2540 – C:2017	mg/L	126	124	500
5	Chemical Oxygen Demand	APHA (23rd Edition) 5220-B: 2017	mg/L	BDL	BDL	Absent
6	Biochemical Oxygen Demand (BOD) For 3days @ 27˚C	IS 3025 (Part 44): 1993	mg/L	BDL	BDL	Absent
7	Dissolved Oxygen	APHA (23rd Edition) 4500-OC: 2017	mg/L	7.2	7.6	.....
8	Alkalinity	APHA (23rd Edition) 2320-B: 2017	mg/L	96	92	200
9	Total Hardness	APHA (23rd Edition) 2340-C: 2017	mg/L	94	88	200
10	Calcium (Ca2+)	APHA (23rd Edition) 3500-Ca B: 2017	mg/L	19	18	75
11	Magnesium (Mg2+)	APHA (23rd Edition) 3500-Mg B: 2017	mg/L	10	13	30
12	Nitrates as NO_3-N	APHA (23rd Edition) 4500-NO_3-B: 2017	mg/L	0.35	0.29	10
13	Fluoride	APHA (23rd Edition) 4500-F & D: 2017,	mg/L	0.29	0.23	1
14	Total Coliform	APHA (23rd Edition) 9221-B : 2017	MPN/ 100ml	150	64	Shall not be detectable in any 100ml sample
15	Fecal Coliform	APHA (23rd Edition) 9221-E : 2017	MPN/ 100ml	<3	<3	Shall not be detectable in any 100ml sample
16	Ammonical Nitrogen (NH_3-N)	APHA (23rd Edition) 4500-NH_3-C: 2017	mg/L	BDL	BDL	0.5
17	Chlorine (Residual)	APHA (23rd Edition) 4500-Cl-B: 2017	mg/L	BDL	BDL	0.2

BDL – Below Detectable Limit.

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Water & Waste Water Test Report

Report No	2101W021	**Report Date**	12.02.2021
Sample code	Y2101176 & 177	**Test Completion Date**	22.01.2021
Sample Collected date	10.01.2021	**Sample Received Date**	11.01.2021
Sample Collected by	Project Analyst, RO - Eluru.		
Name & Address of the Customer	Environmental Engineer, RO – Eluru.		
Sample Reference	Samples collected from various ULBs.		
Description of Sample	Y2101176 – Inlet of water treatment plant of Tadepalligudem Municipality (Source: Raw water from Eluru canal from Godavari River). Y2101177 – Outlet of water treatment plant of Tadepalligudem Municipality.		

S.No	Parameter (s) / Name of Test	Test Method	Units	Sample Code		IS 10500:2012 Standard
				Y2101 176	Y2101 177	
1	pH	APHA (23rd Edition) 4500 – H+B:2017	pH Units	7.33	7.34	6.5 - 8.5
2	Electrical Conductivity	APHA (23rd Edition) 2510-B: 2017	µS/cm	272	201	1000
3	Total Suspended Solids	APHA (23rd Edition) 2540-D: 2017	mg/L	BDL	BDL	Absent
4	Total Dissolved Solids	APHA (23rd Edition) 2540 – C:2017	mg/L	174	132	500
5	Chemical Oxygen Demand	APHA (23rd Edition) 5220-B: 2017	mg/L	BDL	BDL	Absent
6	Biochemical Oxygen Demand (BOD) For 3days @ 27˚C	IS 3025 (Part 44): 1993	mg/L	BDL	BDL	Absent
7	Dissolved Oxygen	APHA (23rd Edition) 4500-OC: 2017	mg/L	7.5	6.9	.....
8	Alkalinity	APHA (23rd Edition) 2320-B: 2017	mg/L	92	86	200
9	Total Hardness	APHA (23rd Edition) 2340-C: 2017	mg/L	112	96	200
10	Calcium (Ca2+)	APHA (23rd Edition) 3500-Ca B: 2017	mg/L	24	19	75
11	Magnesium (Mg2+)	APHA (23rd Edition) 3500-Mg B: 2017	mg/L	13	12	30
12	Nitrates as NO_3-N	APHA (23rd Edition) 4500-NO_3-B: 2017	mg/L	0.46	0.41	10
13	Fluoride	APHA (23rd Edition) 4500-F & D: 2017,	mg/L	0.50	0.34	1
14	Total Coliform	APHA (23rd Edition) 9221-B : 2017	MPN/ 100ml	150	75	Shall not be detectable in any 100ml sample
15	Fecal Coliform	APHA (23rd Edition) 9221-E : 2017	MPN/ 100ml	<3	<3	Shall not be detectable in any 100ml sample
16	Ammonical Nitrogen (NH_3-N)	APHA (23rd Edition) 4500-NH_3-C: 2017	mg/L	BDL	BDL	0.5
17	Chlorine (Residual)	APHA (23rd Edition) 4500-Cl-B: 2017	mg/L	BDL	BDL	0.2

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Water & Waste Water Test Report

Report No	2101W022	**Report Date**	12.02.2021
Sample code	Y2101178 & 179	**Test Completion Date**	22.01.2021
Sample Collected date	10.01.2021	**Sample Received Date**	11.01.2021
Sample Collected by	Project Analyst, RO - Eluru.		
Name & Address of the Customer	Environmental Engineer, RO – Eluru.		
Sample Reference	Samples collected from various ULBs.		
Description of Sample	Y2101178 – Inlet (Raw water from Venkayya & Weyyuru canal from Godavari River) of Akiveedu Municipality. Y2101179 – Outlet (Only after chlorination of water) of Akiveedu Municipality.		

S.No	Parameter (s) / Name of Test	Test Method	Units	Sample Code		IS 10500:2012 Standard
				Y2101 178	Y2101 179	
1	pH	APHA (23rd Edition) 4500 – H+B:2017	pH Units	7.20	7.18	6.5 - 8.5
2	Electrical Conductivity	APHA (23rd Edition) 2510-B: 2017	µS/cm	864	805	1000
3	Total Suspended Solids	APHA (23rd Edition) 2540-D: 2017	mg/L	BDL	BDL	Absent
4	Total Dissolved Solids	APHA (23rd Edition) 2540 – C:2017	mg/L	545	498	500
5	Chemical Oxygen Demand	APHA (23rd Edition) 5220-B: 2017	mg/L	BDL	BDL	Absent
6	Biochemical Oxygen Demand (BOD) For 3days @ 27 ° C	IS 3025 (Part 44): 1993	mg/L	BDL	BDL	Absent
7	Dissolved Oxygen	APHA (23rd Edition) 4500-OC: 2017	mg/L	5.9	6.2	.....
8	Alkalinity	APHA (23rd Edition) 2320-B: 2017	mg/L	116	112	200
9	Total Hardness	APHA (23rd Edition) 2340-C: 2017	mg/L	192	188	200
10	Calcium (Ca2+)	APHA (23rd Edition) 3500-Ca B: 2017	mg/L	35	32	75
11	Magnesium (Mg2+)	APHA (23rd Edition) 3500-Mg B: 2017	mg/L	26	25	30
12	Nitrates as NO_3-N	APHA (23rd Edition) 4500-NO_3-B: 2017	mg/L	0.94	0.47	10
13	Fluoride	APHA (23rd Edition) 4500-F & D: 2017,	mg/L	0.60	0.52	1
14	Total Coliform	APHA (23rd Edition) 9221-B : 2017	MPN/ 100ml	150	89	Shall not be detectable in any 100ml sample
15	Fecal Coliform	APHA (23rd Edition) 9221-E : 2017	MPN/ 100ml	<3	<3	Shall not be detectable in any 100ml sample
16	Ammonical Nitrogen (NH_3-N)	APHA (23rd Edition) 4500-NH_3-C: 2017	mg/L	BDL	BDL	0.5
17	Chlorine (Residual)	APHA (23rd Edition) 4500-Cl-B: 2017	mg/L	BDL	BDL	0.2

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Water & Waste Water Test Report

Report No	2101W023	**Report Date**	12.02.2021
Sample code	Y2101180 & 181	**Test Completion Date**	22.01.2021
Sample Collected date	10.01.2021	**Sample Received Date**	11.01.2021
Sample Collected by	Project Analyst, RO - Eluru.		
Name & Address of the Customer	Environmental Engineer, RO – Eluru.		
Sample Reference	Samples collected from various ULBs.		
Description of Sample	Y2101180 – Inlet (Borewell water) Nidadavole Municipality. Y2101181 – Outlet (Only after chlorination of Borewell water) of Nidadavole Municipality.		

S.No	Parameter (s) / Name of Test	Test Method	Units	Sample Code		IS 10500:2012 Standard
				Y2101 180	Y2101 181	
1	pH	APHA (23rd Edition) 4500 – H+B:2017	pH Units	7.26	7.22	6.5 - 8.5
2	Electrical Conductivity	APHA (23rd Edition) 2510-B: 2017	µS/cm	935	890	1000
3	Total Suspended Solids	APHA (23rd Edition) 2540-D: 2017	mg/L	5.1	4.6	Absent
4	Total Dissolved Solids	APHA (23rd Edition) 2540 – C:2017	mg/L	596	552	500
5	Chemical Oxygen Demand	APHA (23rd Edition) 5220-B: 2017	mg/L	BDL	BDL	Absent
6	Biochemical Oxygen Demand (BOD) For 3days @ 27˚C	IS 3025 (Part 44): 1993	mg/L	BDL	BDL	Absent
7	Dissolved Oxygen	APHA (23rd Edition) 4500-OC: 2017	mg/L	6.4	6.8	.....
8	Alkalinity	APHA (23rd Edition) 2320-B: 2017	mg/L	314	316	200
9	Total Hardness	APHA (23rd Edition) 2340-C: 2017	mg/L	324	292	200
10	Calcium (Ca2+)	APHA (23rd Edition) 3500-Ca B: 2017	mg/L	78	75	75
11	Magnesium (Mg2+)	APHA (23rd Edition) 3500-Mg B: 2017	mg/L	31	25	30
12	Nitrates as NO_3-N	APHA (23rd Edition) 4500-NO_3-B: 2017	mg/L	1.98	1.38	10
13	Fluoride	APHA (23rd Edition) 4500-F & D: 2017,	mg/L	0.78	0.74	1
14	Total Coliform	APHA (23rd Edition) 9221-B : 2017	MPN/ 100ml	89	47	Shall not be detectable in any 100ml sample
15	Fecal Coliform	APHA (23rd Edition) 9221-E : 2017	MPN/ 100ml	<3	<3	Shall not be detectable in any 100ml sample
16	Ammonical Nitrogen (NH_3-N)	APHA (23rd Edition) 4500-NH_3-C: 2017	mg/L	BDL	BDL	0.5
17	Chlorine (Residual)	APHA (23rd Edition) 4500-Cl-B: 2017	mg/L	BDL	BDL	0.2

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Water & Waste Water Test Report

Report No	2101W024	**Report Date**	12.02.2021
Sample code	Y2101182 & 183	**Test Completion Date**	22.01.2021
Sample Collected date	10.01.2021	**Sample Received Date**	11.01.2021
Sample Collected by	Project Analyst, RO - Eluru.		
Name & Address of the Customer	Environmental Engineer, RO – Eluru.		
Sample Reference	Samples collected from various ULBs.		
Description of Sample	Y2101182 – Inlet (Borewell water) Kovvur Municipality. Y2101183 – Outlet (Only after chlorination of Borewell water) of Kovvur Municipality.		

S.No	Parameter (s) / Name of Test	Test Method	Units	Sample Code		IS 10500:2012 Standard
				Y2101182	Y2101183	
1	pH	APHA (23rd Edition) 4500 – H+B:2017	pH Units	6.99	7.06	6.5 - 8.5
2	Electrical Conductivity	APHA (23rd Edition) 2510-B: 2017	µS/cm	263	308	1000
3	Total Suspended Solids	APHA (23rd Edition) 2540-D: 2017	mg/L	BDL	BDL	Absent
4	Total Dissolved Solids	APHA (23rd Edition) 2540 – C:2017	mg/L	189	163	500
5	Chemical Oxygen Demand	APHA (23rd Edition) 5220-B: 2017	mg/L	BDL	BDL	Absent
6	Biochemical Oxygen Demand (BOD) For 3days @ 27˚C	IS 3025 (Part 44): 1993	mg/L	BDL	BDL	Absent
7	Dissolved Oxygen	APHA (23rd Edition) 4500-OC: 2017	mg/L	6.6	6.0	.....
8	Alkalinity	APHA (23rd Edition) 2320-B: 2017	mg/L	138	120	200
9	Total Hardness	APHA (23rd Edition) 2340-C: 2017	mg/L	156	116	200
10	Calcium (Ca2+)	APHA (23rd Edition) 3500-Ca B: 2017	mg/L	38	35	75
11	Magnesium (Mg2+)	APHA (23rd Edition) 3500-Mg B: 2017	mg/L	14	7	30
12	Nitrates as NO_3-N	APHA (23rd Edition) 4500-NO_3-B: 2017	mg/L	0.22	0.26	10
13	Fluoride	APHA (23rd Edition) 4500-F & D: 2017,	mg/L	0.43	0.37	1
14	Total Coliform	APHA (23rd Edition) 9221-B : 2017	MPN/ 100ml	89	47	Shall not be detectable in any 100ml sample
15	Fecal Coliform	APHA (23rd Edition) 9221-E : 2017	MPN/ 100ml	<3	<3	Shall not be detectable in any 100ml sample
16	Ammonical Nitrogen (NH_3-N)	APHA (23rd Edition) 4500-NH_3-C: 2017	mg/L	BDL	BDL	0.5
17	Chlorine (Residual)	APHA (23rd Edition) 4500-Cl-B: 2017	mg/L	BDL	BDL	0.2

BDL – Below Detectable Limit.

Note:

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- The results relate only to the items tested.

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Water & Waste Water Test Report

Report No	2101W025	**Report Date**	12.02.2021
Sample code	Y2101184 & 185	**Test Completion Date**	22.01.2021
Sample Collected date	10.01.2021	**Sample Received Date**	11.01.2021
Sample Collected by	Project Analyst, RO - Eluru.		
Name & Address of the Customer	Environmental Engineer, RO – Eluru.		
Sample Reference	Samples collected from various ULBs.		
Description of Sample	Y2101184 – Inlet (Borewell water) Jangareddygudem Municipality. Y2101185 – Outlet (Only after chlorination of Borewell water) of Jangareddygudem Municipality.		

S.No	Parameter (s) / Name of Test	Test Method	Units	Sample Code		IS 10500:2012 Standard
				Y2101 184	Y2101 185	
1	pH	APHA (23rd Edition) 4500 – H+B:2017	pH Units	7.10	7.03	6.5 - 8.5
2	Electrical Conductivity	APHA (23rd Edition) 2510-B: 2017	µS/cm	756	742	1000
3	Total Suspended Solids	APHA (23rd Edition) 2540-D: 2017	mg/L	4.6	4.0	Absent
4	Total Dissolved Solids	APHA (23rd Edition) 2540 – C:2017	mg/L	476	468	500
5	Chemical Oxygen Demand	APHA (23rd Edition) 5220-B: 2017	mg/L	BDL	BDL	Absent
6	Biochemical Oxygen Demand (BOD) For 3days @ 27°C	IS 3025 (Part 44): 1993	mg/L	BDL	BDL	Absent
7	Dissolved Oxygen	APHA (23rd Edition) 4500-OC: 2017	mg/L	7.4	7.2	.....
8	Alkalinity	APHA (23rd Edition) 2320-B: 2017	mg/L	212	190	200
9	Total Hardness	APHA (23rd Edition) 2340-C: 2017	mg/L	288	284	200
10	Calcium (Ca2+)	APHA (23rd Edition) 3500-Ca B: 2017	mg/L	96	83	75
11	Magnesium (Mg2+)	APHA (23rd Edition) 3500-Mg B: 2017	mg/L	19	19	30
12	Nitrates as NO_3-N	APHA (23rd Edition) 4500-NO_3-B: 2017	mg/L	8.37	7.51	10
13	Fluoride	APHA (23rd Edition) 4500-F & D: 2017,	mg/L	0.92	0.95	1
14	Total Coliform	APHA (23rd Edition) 9221-B : 2017	MPN/ 100ml	89	64	Shall not be detectable in any 100ml sample
15	Fecal Coliform	APHA (23rd Edition) 9221-E : 2017	MPN/ 100ml	<3	<3	Shall not be detectable in any 100ml sample
16	Ammonical Nitrogen (NH_3-N)	APHA (23rd Edition) 4500-NH_3-C: 2017	mg/L	BDL	BDL	0.5
17	Chlorine (Residual)	APHA (23rd Edition) 4500-Cl-B: 2017	mg/L	BDL	BDL	0.2

BDL – Below Detectable Limit.

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ANALYSIS REPORT

Sample No. : **2021 – 01 – W – 292 to 297**

Sample location/Address : Water Tank Samples, Panchyat Water at houses in Pulla (V), West Godavari District.

Sample Source :

W-292: Sample collected from Eluru Canal, NH-5 Road, Chebrolu

W-293: Sample collected from Eluru Canal, NH-5 Road, Kikaram

W-294: Sample collected from Eluru Canal, NH-5 Road, Pulla (Source of Drinking water for Pulla Village)

W-295: Sample collected from water reservoir pond (Inlet) at Pulla (V), Bhimadolu (M), West Godavair District

W-296: Water sample collected from water tank Oultet (Filter water) at Pulla (V), Bhimadolu (M), West Godavair District

W-297: Water sample collected from bore well water at Pulla (V), Bhimadolu (M), West Godavair District

Sample collected on : 20.01.2021

Sample submitted on : 21.01.2021

Sample collected by : Assistnat Environmental Engineer & Analyst (OS), Regional Office, Eluru

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ANALYSIS REPORT

Sl. No.	Parameter	W-292	W-293	W-294	W-295	W-296	W-297	Dri Acc
Physico Chemical Parameters:								
1.	pH	7.05	7.21	7.24	6.76	6.77	7.61	
2.	Dissolved Oxygen	5.7	4.5	4.7	7.2	4.3	2.4	
3.	Chemical Oxygen Demand	4.8	6.0	8.4	6.4	< 2.0	< 2.0	
4.	Total Dissolved Solids	184	176	232	216	288	1396	
5.	Chlorides (as Cl^-)	24.4	34.2	39.1	39.1	48.9	322.8	
6.	Total Hardness (as $CaCO_3$)	160	120	100	112	120	572	
7.	Total Alkalinity (as $CaCO_3$)	96	104	100	76	96	404	
8.	Phosphates (as PO_4^{3-})	0.23	0.04	0.04	0.04	0.02	0.01	
9.	Sulphates (as SO_4^{2-})	14.3	13.7	14.6	47.5	62.0	163.1	
10.	Fluorides (as F^-)	0.42	0.38	0.51	0.28	0.30	0.38	
11.	Nitrates (as NO_3)	2.92	1.85	1.94	1.63	7.43	20.76	
12.	Calcium (as Ca^{+2})	19.2	16.0	19.2	16.0	33.6	118.4	
13.	Magnesium (as Mg^{+2})	27.2	19.4	12.6	17.5	8.7	67.0	
14.	Ammonical Nitrogen (as NH_3-N)	0.19	0.12	0.25	0.40	BDL	BDL	
Heavy Metals:								
1.	Nickel (as Ni)	0.0002	0.0002	0.0002	0.0001	0.0001	0.0007	
2.	Arsenic (as As)	0.0003	0.0004	0.0002	0.0003	0.0001	<0.0001	
3.	Lead (as Pb)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
4.	Chromium (as Cr)	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	
5.	Iron (as Fe)	0.0078	0.0084	0.0089	0.0072	0.0116	0.0545	
6.	Copper (as Cu)	0.0007	0.0003	0.0003	0.0001	0.0003	0.0032	
7.	Zinc (as Zn)	0.0002	0.0001	0.0002	0.0001	<0.0001	0.0002	
8.	Cadmium (as Cd)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
9.	Mercury (as Hg)	<0.0001	<0.0001	0.0001	0.0005	<0.0001	0.0007	

Note: - All values are expressed in mg/l except pH

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Sl. No	Parameters	W-294	W-295	W-296	Limit
Pesticides:					
1.	Alpha – BHC	<0.01	<0.01	<0.01	0.01 µg/l
2.	Beta– BHC	<0.01	<0.01	<0.01	0.04 µg/l
3.	Gamma – BHC	<0.01	<0.01	<0.01	2.0 µg/l
4.	4,4' – DDD	<0.01	<0.01	<0.01	1.0 µg/l
5.	4,4' – DDE	<0.01	<0.01	<0.01	1.0 µg/l
6.	4,4' – DDT	<0.01	<0.01	<0.01	1.0 µg/l
7.	Aldrin	<0.01	<0.01	<0.01	0.03 µg/l
8.	Dieldrin	<0.01	<0.01	<0.01	0.03 µg/l
9.	Endosulfan – I	<0.01	<0.01	<0.01	0.4 µg/l
10.	Endosulfan Sulfate	<0.01	<0.01	<0.01	0.4 µg/l
11.	Endrin	<0.01	<0.01	<0.01	–
12.	Heptachlor	<0.01	<0.01	<0.01	–
13.	Heptachlorapoxide	<0.01	<0.01	<0.01	–
14.	Methoxychlor	<0.01	<0.01	<0.01	–
15.	Endosulfan – II	<0.01	<0.01	<0.01	0.4 µg/l
16.	Delta – BHC	<0.01	<0.01	<0.01	0.04 µg/l
17.	Endrin Aldehyde	<0.01	<0.01	<0.01	–

Note: 1. The pesticide results are expressed in µg/l
2. the limits mentioned are Drinking water specification IS10500:2012.

Remarks: Analysis was carried out on GC-MS for Organochloro pesticides (17 compounds) mentioned above. Pesticide analysis was carried out for the samples 294,295 and 296.

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