BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

ORIGINAL APPLICATION No. 259 OF 2020 & 02 OF 2021 (SZ)
With
Original Application No.02 of 2021 (SZ)

In The Matter of:

Tribunal on its own motion Suo Motu based on the news item in The Indian Express, Newspaper dt. 09.12.2020, "Andhra town Eluru hit by „mystery" illness, Traces of lead, nickel in blood samples", News item in The Time of India, Newspaper Dt. 08.12.2020, "Heavy metal content in water Caused mysterious disease in Andhra Pradesh" & News item in NDTV, dt. 09.12.2020, "Lead, Nickel found in blood of people with Mystery illness in Andhra". .....Applicant (s)

Verses

The Chief Secretary of Govt. of Andhra Pradesh And Ors. ....Respondent (s)

With

Tribunal on its own motion Suo Motu based on the news item in The Hindu, edition dated 15.12.2020, "Kolleru (West Godavari Dt.) "Mystery illness raises Concerns over Kolleru Pollution". .....Applicant (s)

Verses

The Chief Secretary to Govt. of Andhra Pradesh, Andhra Pradesh and Ors. ....Respondent (s)

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K. Srinivas
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REPORT OF ANDHRA PRADESH POLLUTION CONTROL BOARD ON THE POLLUTION OF KOLLERU LAKE IN THE MATTER OF O. A. No. 259 / 2020 (SZ) WITH O. A. No. 02 / 2021 (SZ) IN COMPLIANCE WITH THE HON'BLE NGT, CHENNAI ORDERS DATED 07.06.2021 & 03.01.2022:

1. Preamble:

The Hon'ble NGT, Chennai in its order dated 07.06.2021 in the case of O. A. No. 259 / 2020 (SZ) with O. A. No. 02 / 2021 (SZ) directed Andhra Pradesh Pollution Control Board (APPCB):

….. *"11. When this was pointed out, the learned counsel appearing for the State departments submitted that they will come with a further action taken report or any plan for the State Government to improve the water quality in that lake. The APPCB should also file a factual report on the pollution of Kolleru lake caused by Industries, Agricultural operations & sewage discharge. They are expected to carry out the analysis scientifically by collecting the samples at (1) inlets and outlets of the Industrial zones which are ultimately draining into the Kolleru Lake, (2) confluence points of major drains into the Kolleru Lake – surface water samples and sediment samples to be tested, (3) in case any settling ponds have been established prior to the joining of the drains into the lake, then samples of both surface water and the sediments in the settling ponds should be tested. The APPCB is expected to undertake the study comprehensively and not resort to filing a report based on cursory studies. The report has to be approved by the Chairman prior to submission.*

17. The State of Andhra Pradesh is directed to give direction to the Irrigation Department to conduct studies as directed and submit a report to this Tribunal. As regards the Kolleru Lake is concerned, the Irrigation Department, Andhra Pradesh Pollution Control Board and the Forest Department are directed to submit a detailed report regarding the steps to be taken for improving the water quality in that lake.

18. The respective departments are directed to submit a report to this Tribunal on or before 28.07.2021 by e-filing in the form of Searchable PDF/ OCR Supportable PDF and not in the form of Image PDF along with necessary hardcopies to be produced as per Rules".

The copy of the Hon'ble NGT order dated 07.06.2021 is enclosed as *Annexure - 1.*

2. APPCB requests time for submission of report:

In this regard, APPCB has requested three months time for monitoring of water and sediment quality and various drains joining Kolleru lake and lake itself, vide letter dated 26.07.2021.

APPCB requested further three months time, vide letter dated 25.10.2021 to submit report on pollution of Kolleru lake as the three months period, August, September & October, being monsoon season with heavy rainfall in the catchment, the inlet drains and the lake with brimful water made it difficult the accessibility of the location for sampling of water and sediment.

Further, APPCB in its letter dated 21.12.2021, submitted that water quality monitoring of inlet drains and lake will be carried out post monsoon season upto January, 2022 and the comprehensive report on pollution of Kolleru lake will be submitted by 31.01.2022.

The Hon'ble NGT in its order, dated 03.01.2022 in the case of O. A. No. 259 / 2020 (SZ) with O. A. No. 02 / 2021 (SZ) directed Andhra Pradesh Pollution Control Board (APPCB):

….. *"8. They are directed to submit the respective reports to this Tribunal on or before 10.02.2022 by e-filing in the form of Searchable PDF/OCR Supportable PDF and not in the form of Image PDF along with necessary hardcopies to be produced as per Rules".*

The copy of the Hon'ble NGT order dated 03.01.2022 is enclosed as *Annexure - 2.*

3. Comprehensive report on pollution of Kolleru lake:

3.1 Introduction:

Kolleru lake is one of the largest fresh water Eco System (Wetland) in India of international importance recognized under Ramsar Convention (Iran 1971). The lake is located in between latitudes 16°13' and 16°45' North and longitudes 81°05' and 81°21' East and is about 35 kms away from the sea coast of Bay of Bengal. It is a naturally formed lake between the alluvial plains of river Godavari and river Krishna deltas and acts as a natural flood balancing reservoir. The lake with its variety of habitats supports rich biodiversity including some endangered species and supports livelihood of large population living in and around the wetland system.

The lake has been under tremendous pressure due to unsustainable developmental activities, particularly agriculture and aquaculture, which have led to concentration of

hydraulic structures, roads, bunds and other infrastructure within its basin. The area under cultivation within the lake increased since 1940, when British government granted pattas (title deeds) on payment of market value for land. In 1954, the government initiated cooperative farming in the region inducing formation of 93 farming societies on 850 sq km of the lake bed. The native paddy varieties were gradually replaced with shorter, high-yielding varieties that required application of high dosages of chemical fertilizers and pesticides. By 1969, almost entire lake was brought under cultivation and huge bunds were constructed to keep water out to protect the crops. As floods threatened cultivated areas almost every year, several control measures were also initiated during this period. However, the entire area was ravaged by a cyclone in 1969 which led to near complete destruction of agriculture. By the time flood control measures were completed, most of the people had become disillusioned with agriculture and had abandoned it. The roads and bridges that came up with agricultural development coupled with the increased demand for fish created a new livelihood opportunity and vast market for fish by 1978. Land use shifted to pisciculture which suddenly became profitable and by 1984, 5000 acres of government land within the lake bed was converted to fish tanks under the management of cooperative societies. Land was arbitrarily and haphazardly notified for pisciculture in total disregard to natural drainage Pattern. High profit margins subsequently induced contractors and private entrepreneurs into the Kolleru Lake area, who intensified aquaculture without adopting any environmental safeguards.

Realizing the rapid degradation of Kolleru Lake, Government of Andhra Pradesh constituted several committees to propose measures for its restoration. Most of these committees, however, suggested engineering solutions aimed at agriculture and fisheries development and flood control. The measures proposed aimed at diversion of water to the upstream reaches reducing flows to the lake. The report of the expert committee on floods of deltaic areas on Krishna, Godavari and Guntur districts by Mitra Committee in 1966 suggested construction of reservoirs at Budameru and Tammilaru for storage of flood waters (Mitra, 1966). Widening of Upputeru was proposed to drain the floodwaters with the lake levels controlled through construction of a regulator (Mitra, 1966; Sreeramakrishnaiah, 1987; Ramakrishnan, 1980). Pandurangam (1976) recommended construction of 71 tanks and necessary development to promote fisheries. Construction of roads, school buildings, hospitals,

electrification, and development of piggery, duckery and dairy farm for socioeconomic benefit were also recommended. Implementation of these recommendations have ultimately aggravated floods and led to overall degradation of wetland ecosystem.

3.2 Hydrology and drainage:

The lake spreads over an area of 2,25,250 acres up to +10' contour with rich biodiversity. Water spread area of Kolleru lake, contour-wise is as follows:

S. No.	Contour	Area in acres
1	Up to +10' contour MSL	2,25,250
2	Up to +7' Contour MSL	1,68,750
3	Up to +5' contour MSL	77,138
4	Up to +3' contour MSL	33,750

Source: *Department of Forest, Govt. of Andhra Pradesh report dated 02.11.2021.*

3.3 Catchment Area:

The total catchment area of Kolleru lake is eleven lakhs ninety thousand seven hundred and fifty acres (11,90,750). Out of which, the upland catchment area is eight lakhs fifty thousand seven hundred and fifty acres (8,50,750) and the remaining three lakhs forty thousand acres (3,40,000) is in delta area. The lake receives inflows from nearly 67 medium & minor drains in West Godavari District and 14 drains from Krishna District. Major of them are, Budameru, Tammileru (east & west), Mondikodu, Bulusuvagu, Tokalapalli drain, Jodi Kaluva, Pandikodu drain, Kovvali drain, Chandraiah drain, Narasannapalem drain, Polaraj drain, etc. It receives an inflow of 1,10,000 cusecs of water and discharges @ 13,900 cusecs per day at +7' contour level capacity on the lake mouth through a single outlet called Upputeru drain into Bay of Bengal.

3.4 Declaration of Kolleru Sanctuary:

Government of Andhra Pradesh has issued notification declaring Kolleru as a Wildlife Sanctuary, vide G. O. Ms. No.120, EFS&T (For.III) Dept., dated 04.10.1999 (*Annexure – 3*). The Kolleru Wildlife Sanctuary spread over nine (9) Mandals, i.e., seven (7) Mandals in West Godavari and two (2) Mandals in Krishna District with an extent of

30,855.20 hectares or 77,138 acres up to +5' contour. Out of this 14,861.33 acres is privately owned patta lands.

The area details of sanctuary, District and Mandal wise are as follows:

S. No.	District	Name of the Mandal	Area in Acres
1	West Godavari	Eluru	23,900
2		Unguturu	134
3		Pedapadu	789
4		Denduluru	586
5		Akiveedu	6,914
6		Nidamarru	6,838
7		Bhimadolu	20,323
		West Godavari District total	**59,484**
8	Krishna	Kaikalur	10,295
9		Mandavalli	7,359
		Krishna District Total	**17,654**
		Total	**77,138**

Source: *Department of Forest, Govt. of Andhra Pradesh report dated 02.11.2021.*

There are 122 villages inside the sanctuary area (46 bed villages and 76 belt villages) with a population of more than 3,00,000 people mostly dependent on the lake for their livelihood like capturing fish and traditional agriculture in the past upto 1980s.

3.5 Details of private patta lands owned by farmers:

Traditional agriculture in the privately owned lands is permitted as per G. O. Ms. No. 120, EFS & T (For.III) Dept., dated 04.10.1999. The details of patta lands owned by private owners having legal rights to practice traditional agriculture within the sanctuary area up to +5' contour is 14,861.33 acres out of the total sanctuary area of 77,138 acres. The details of patta lands, District and Mandal wise are as follows:

S. No.	District & Mandal	No. of villages	No. of Ryots	Extent of area in Acres involved
West Godavari District				
1	Eluru	7	399	823.61
2	Pedapadu	3	199	496.52
3	Denduluru	2	111	380.28
4	Bhimadolu	5	1,167	2,426.87
5	Nidamarru	11	4,126	6,150.63
6	Unguturu	1	30	146.46
7	Akiveedu	10	1,981	3,475.1
	Total	**39**	**8,013**	**13,899.47**

Krishna District				
1	Kaikaluru	10	125	571.45
2	Mandavalli	5	71	390.41
	Total	**15**	**196**	**961.86**
	Grand total	**54**	**8,209**	**14,861.33**

Source: *Department of Forest, Govt. of Andhra Pradesh report dated 02.11.2021.*

As per G. O. Ms. No. 120, dated 04.10.1999, and the judgment of Hon'ble High Court, dated 30.07.2001 and also as per the Hon'ble Supreme Court of India's orders in April, 2006 the owners of the agriculture lands can practice traditional agriculture without using pesticides and chemicals.

But, the farmers are demanding to permit them to use chemical fertilizers to get more yields, which is illegal not permitted. Otherwise, they are requesting to pay adequate compensation to their own lands.

The District Collectors, West Godavari and Krishna have indicated an amount of Rs. 625.48 Crores and Rs. 30.00 Crores to acquire an extent of 13,899.47 acres and 961.86 acres, respectively.

As per the directions of the Hon'ble Supreme Court of India, totally, 1,776 tanks (1,140 in West Godavari and 636 in Krishna Districts) covering an area of about 43,724 acres (28,949 acres in West Godavari and 15,775 acres in Krishna) have been demolished in Kolleru Wildlife Sanctuary up to +5' contour and completed by 15.06.2006. The demolition was carried out by the Revenue Department under the supervision of District Collectors of respective Districts (***Source:*** *Department of Forest, Govt. of Andhra Pradesh report dated 02.11.2021).*

3.6 Water quality monitoring of inlets, outlet & lake and status:

Andhra Pradesh Pollution Control Board (APPCB) has monitored water quality of Kolleru lake, its inlet streams / drains and the lone outlet, Upputeru during the period of six months from August, 2021 to January, 2022. Details of monitoring points along with GPS coordinates are as follows:

S. No.	Sampling Locations	Latitude	Longitude
I	**Lake Points:**		
1	Gudivakalanka, West Godavari District	16°39'21.84"N	81°12'03.18"E
2	Kokkirayalanka, West Godavari District	16°38'38.29"N	81°14'00.68"E
3	Chettunnapadu, West Godavari District	16°40'35.97"N	81°15'59.15"E
4	Pedaedlagadi, Krishna District	16°36'48.28"N	81°09'58.38"E

5	Chinaedlagadi, Krishna District	16°36'05.05"N	81°11'01.42"E
6	Kolleti kota, Krishna District	16°36'49.49"N	81°18'32.61"E
7	Circar canal, Krishna District	16°36'51.97"N	81°18'58.26"E
8	Srungavarappadu, Krishna District	16°39'03.25"N	81°17'57.29"E
9	Bird Life Sanctuary, Atapaka Village, Krishna District	16°34'15.51"N	81°13'52.35"E
II	**Inlets:**		
1	Mondikodu Grampachayat, West Godavari District	16°40'36.42"N	81°11'48.44"E
2	Jodi Kaluva, West Godavari District	16°38'24.85"N	81°15'56.04"E
3	Bulusuvagu, West Godavari District	16°47'51.96"N	81°14'02.66"E
4	Tokalapalli drain, West Godavari District	16°47'51.70"N	81°24'52.39"E
5	Pandikodu drain, West Godavari District	16°44'44.26"N	81°25'12.40"E
6	Kovvali drain, West Godavari District	16°43'47.92"N	81°09'43.25"E
7	East Tammileru, West Godavari District	16°43'20.42"N	81°07'30.58"E
8	West Tammileru, West Godavari District	16°41'40.65"N	81°05'27.29"E
9	Chandraiah drain, Krishna District	16°26'48.23"N	80°59'27.73"E
10	Budameru, Krishna District	16°30'38.27"N	80°57'31.55"E
11	Narasannapalem, Krishna District	16°33'45.55"N	80°57'23.53"E
12	Polaraj drain, Krishna District	16°33'49.64"N	81°11'28.40"E
13	Chandraiah drain at Polukonda Village, Krishna District	16°31'12.69"N	81°04'52.35"E
III	**Outlet:**		
1	Upputeru on road bridge Kaikaluru - Akivedu Highway	16°34'31.13"N	81°20'42.08"E
Maps showing the lake, inlet and outlet sampling points enclosed.			

Samples have been collected from the above mentioned lake points at nine (9) locations, inlet points at thirteen (13) locations and lone outlet, Upputeru for the period of six (6) months from August, 2021 to January, 2022 and analysed for important parameters in respect of organic, inorganic and bacteriological loads like, pH, Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD), Dissolved Oxygen (DO), Water Soluble Phosphates, Total Coli Form, Fecal Coli Form & toxic metals. Pesticide residues have been analyzed for the samples collected during August, 2021 & January, 2022.

Discussion on analysis results obtained during monitoring is as follows:

3.6.1 Lake water quality characteristics:

pH Values: pH value signifies whether water is acidic (<7.0) or alkaline (>7.0) or neutral (7.0) in nature. pH value of all the lake points collected during the six months period from August, 2021 to January, 2022 found to be neutral in nature in the range between 6.82 & 8.45, and are within the CPCB classification criteria for designated best use classes, A, B, C & D (Table – 1: pH values - Lake points). These neutral pH values at all the lake points shows that no effluents of acidic or alkaline nature are joining Kolleru lake.

Dissolved Oxygen (DO): Presence of **o**xygen in any water body in dissolved condition in optimum concentrations is very important for the survival of aquatic fauna. Contamination of any water body with domestic or industrial effluent will drastically affects the dissolved oxygen concentrations there by endangering the aquatic life.

The dissolved concentrations at various locations in the lake varies in the range between zero (nil) and 8.50 mg/lit (Table – 2: Dissolved Oxygen – Lake points). As per the CPCB classification criteria for designated best use, minimum 5.0 and 4.0 mg/lit of DO shall be present for the water to use as drinking water source (Class A & Class C) and 4.0 mg/lit of DO for propagation of wildlife and fisheries (Class D). DO values found to be < 4.0 mg/lit at Gudivakalanka during October, 2021; Kokkirayalanka during August, September & October, 2021; Chettunnapadu during August, 2021; Pedaedlagadi during August & October, 2021; Kolletikota, August, October & November, 2021 and Circar canal during November, 2021. Low concentrations of DO at these locations during the above said periods could be attributed to sudden gushing of domestic sewage contaminated inflow of storm water through various inlets into the lake thereby depleting the DO concentrations.

However, the DO concentration in the entire lake locations became saturated and stabilized to above 5.0 mg/lit during December, 2021 & January, 2022.

Total Dissolved Solids (TDS): Water soluble solids particularly salts in the form of anions and cations contributes to TDS in waters with high dissolved solids generally are of inferior palatability and may induce an unfavourable physiological reaction in the transient consumer.

TDS concentrations within the lake during the period of six months from August, 2021 to January, 2022 found to be in the range between 530 & 3880 mg/lit (Table – 3: Total Dissolved Solids – Lake points). On comparison with drinking water standards, the TDS concentrations at Gudivakalanka, September, 2021; Kokkirayalanka, Paedaedlagadi, Kolletikota, Circar canal & Srungavarappadu during January, 2022; Chinaedlagadi during August & September, 2021 & January, 2022 and Atapaka bird sanctuary during August, 2021 are exceeding the maximum permissible drinking water standard limit of 2000 mg/lit.

High concentrations of TDS in the lake could be attributed to the discharge of aqua culture pond effluents and domestic sewage with high TDS content into the lake through various inlets.

Chemical Oxygen Demand (COD): COD is used as a measurement of total organic pollution load, biodegradable & non-biodegradable in any wastewater or natural waters. COD concentrations in the lake found to be in the range between 4 to 156 mg/lit (Table – 4: Chemical Oxygen Demand – Lake points). No standards have been stipulated for the COD parameters either for drinking purpose or for other purposes like, propagation of wildlife & fisheries, irrigation, etc. However, high concentration of COD implies high concentration of organic pollution of that water body.

Higher concentrations of COD have been observed at various locations of the lake, which can be attributed to the joining of domestic sewage and aqua culture pond effluents in the lake through various inlets.

Bio-chemical Oxygen Demand (BOD): BOD parameter is a very important in respect of water pollution and indicates the concentration of organic load of a water or a wastewater, which is biodegradable in nature or amenable for bacteria for degradation.

BOD concentrations in the lake found to be in the range between 1.2 and 20.2 mg/lit (Table – 5: Bio-chemical Oxygen Demand (mg /l) – Lake points). As per the CPCB classification criteria for designated best use, BOD shall be < 2.0 and < 3.0 mg/lit in the water to use as drinking water source (Class A, B & Class C).

BOD values in the lake found to be > 3.0 mg/lit at Gudivakalanka during October, 2021 & January, 2022; Kokkirayalanka during January, 2022; Chettunnapadu & Chinaedlagadi during the entire six months period from August, 2021 to January, 2022; Pedaedlagadi during August, December, 2021 and January, 2022; Kolletikota during August, 2021 & January, 2022 and Circar canal & Srungavarappadu during January, 2022.

Further observed that the BOD concentrations are exceeding the standard limit of 3.0 mg/lit at all locations during January, 2022.

Phosphates (water soluble): Presence of phosphates in the water indicates that the water is contaminated with domestic sewage. Phosphate concentrations in the lake found to be in the range between 0.09 to 1.36 mg/lit (Table – 5: Phosphates (mg /l) – Lake points). No standards have been stipulated for the Phosphate parameter either for drinking purpose or for other purposes like, propagation of wildlife & fisheries, irrigation, etc.

Phosphate is present in almost all the locations of the lake in varying concentrations, which indicates that phosphate is finding its way in the lake through various inlets carrying domestic sewage. Phosphate is an ingredient in the detergents used in the households for washing cloths and utensils.

Total coliform & Fecal coliform: Total coliform bacteria in the lake found to be in the range between 7 and 460 MPN/100 ml. Fecal coliform bacteria in the lake found to be < 3 MPN / 100 ml.

Source of total and fecal form bacteria in the lake water is joining of domestic wastewater into the lake through various inlets.

Metals: Lake water has been tested for metals like, Iron, Manganese, Nickel, Total Chromium, Lead, Copper, Cadmium, Arsenic, Mercury and Zinc. These concentrations have been compared with that of the metal standards stipulated for drinking water (IS 10500:2012).

Iron concentration in the lake found to be in the range between 0.0015 and 1.41 mg/lit. All except at locations Chinaedlagadi during August, 2021 and Kolletikota &

Circar canal during January, 2022, the iron concentrations in the lake found to be within the stipulated acceptable standard limit of 0.3 mg/lit. for drinking water.

Manganese concentration in the lake found to be in the range between BDL and 0.33 mg/lit. All except at locations Chettunnapadu during August, 2021and Chinaedlagadi & Kolletikota during January, 2022, the manganese concentrations in the lake found to be within the stipulated acceptable standard limit of 0.1 mg/lit. for drinking water.

Nickel concentrations in the entire lake found to be within the stipulated acceptable standard limit of 0.02 mg/lit. for drinking water.

Total Chromium concentrations in the entire lake found to be within the stipulated acceptable standard limit of 0.05 mg/lit. for drinking water.

Lead concentrations in the entire lake found to be within the stipulated acceptable standard limit of 0.01 mg/lit. for drinking water.

Copper concentrations in the entire lake found to be within the stipulated acceptable standard limit of 0.05 mg/lit. for drinking water.

All except at locations Gudivakalanka, Kokkirayalanka & Chettunnapadu during September, 2021 and Chinaedlagadi, Kolletikota & Circar canal during October, 2021, 2022, the cadmium concentrations in the lake found to be within the stipulated acceptable standard limit of 0.003 mg/lit. for drinking water.

Arsenic concentrations in the entire lake found to be within the stipulated acceptable standard limit of 0.01 mg/lit. for drinking water.

Mercury concentrations in the entire lake found to be within the stipulated acceptable standard limit of 0.001 mg/lit. for drinking water.

Zinc concentrations in the entire lake found to be within the stipulated acceptable standard limit of 5.0 mg/lit. for drinking water.

Pesticides: Lake waters at these above said nine (9) lake points have been analyzed for Organochloro and organophosphorus pesticide residues like Alpha – BHC, Beta – BHC, Gamma – BHC, 4,4'- DDD, 4,4'- DDE, 4,4'- DDT, Aldrin, Dieldrin,

Endosulfan – I, Endosulfan Sulfate, Endrin, Heptachlor, Heptachlorapoxide, Methoxychlor, Endosulfan – II, Delta – BHC and Endrin Aldehyde for the samples collected during August, 2021, and found to be below detectable concentrations (0.05 mg / lit.). Lake waters and sediments have been analyzed for pesticide residues during January, 2022 through 3rd party reputed Environmental Laboratory, M/s. Vimta Labs Ltd., Hyderabad. Not found any pesticide residue in both water and sediments even in detectable concentrations (0.00002 mg / l).

3.6.2 Water quality characteristics of inlets:

3.6.2.1 Mondikodu drain – Lake inlet:

Water sample from this drain collected after confluence with East Tammileru river before joining the lake. Mondikodu drain carries domestic sewage from Denduluru and the villages along the drain. East Tammileru river carries domestic sewage of Eluru town and the villages along with the river. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 10.

pH value is found to be neutral in nature between 7.03 & 7.54; TDS found to be between 456 & 2639 mg / lit; Dissolved Oxygen found to be between 4.9 & 7.0 mg / lit; BOD found to be between 1.8 & 10 mg / lit; COD found to be between 12 & 68 mg / lit; Phosphates 0.02 & 0.76 mg / lit; Total coliform found to be between 15 & 440 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.2 Jodikaluva drain – Lake inlet:

This is a drain originates within the lake bed and carries domestic sewage and aquaculture pond effluents located at Gudivakalanka, Kokkirayalanka, Paidichintapadu, etc. villages and confluences with Kolleru lake. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 11.

pH value is found to be neutral in nature between 7.05 & 7.76; TDS found to be between 739 & 2432 mg / lit; Dissolved Oxygen found to be between 4.8 & 7.2 mg

/ lit; BOD found to be between 2.2 & 8.8 mg / lit; COD found to be between 24 & 60 mg / lit; Phosphates 0.70 & 1.74 mg / lit; Total coliform found to be between 15 & 470 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.3 Bulusuvagu drain – Lake inlet:

The objective of selection of the drain location is to verify discharges of effluents from M/s. Tirumala Milk Products Pvt. Ltd., M/s. Andhra Sugars Ltd., M/s. Naga Hanuman Solvent Oils Pvt. Ltd., etc. located upstream area. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 12.

pH value is found to be neutral in nature between 7.31 & 7.58; TDS found to be between 618 & 2673 mg / lit; Dissolved Oxygen found to be between 2.1 & 6.1 mg / lit; BOD found to be between 2.02 & 15 mg / lit; COD found to be between 20 & 104 mg / lit; Phosphates 0.02 & 1.16 mg / lit; Total coliform found to be between 11 & 460 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.4 Tokalapalli drain – Lake inlet:

The drain originates from the North side catchment of the lake and carries domestic sewage of villages located on its banks and aquaculture ponds. Tadepalligudem municipality is also located in the upstream catchment area to this drain. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 13.

pH value is found to be neutral in nature between 7.07 & 7.76; TDS found to be between 260 & 1302 mg / lit; Dissolved Oxygen found to be between 5.0 & 5.7 mg / lit; BOD found to be between 2.0 & 12.0 mg / lit; COD found to be between 10 & 84 mg / lit; Phosphates 0.03 & 0.41mg / lit; Total coliform found to be between 7 & 440 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.5 Pandikodu drain – Lake inlet:

The drain originates from North Eastern catchment of the lake and carries domestic sewage of various villages located in the vicinity and aquaculture pond effluents located upstream area of the lake. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 14.

pH value is found to be neutral in nature between 7.03 & 7.66; TDS found to be between 350 & 3054 mg / lit; Dissolved Oxygen found to be between 1.5 & 6.4 mg / lit; BOD found to be between 0.8 & 8.2 mg / lit; COD found to be between 16 & 56 mg / lit; Phosphates 0.03 & 0.80 mg / lit; Total coliform found to be between 11 & 380 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.6 Kovvali drain – Lake inlet:

The drain originates at Dendulru and carries domestic sewage & agriculture runoff from various villages located in the vicinity of the drain. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 15.

pH value is found to be neutral in nature between 7.12 & 7.96; TDS found to be between 350 & 912 mg / lit; Dissolved Oxygen found to be between 5.2 & 7.4 mg / lit; BOD found to be between 1.6 & 9.6 mg / lit; COD found to be between 12 & 68 mg / lit; Phosphates 0.02 & 0.89 mg / lit; Total coliform found to be between 15 & 440 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.7 East Tammileru River – Lake inlet:

Tammileru is a river originates in the upstream uplands of Eluru town and divides into East & West Tammileru rivulets and carries domestic sewage of Eluru town & villages and agriculture runoff and drains into Kolleru lake. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 16.

pH value is found to be neutral in nature between 7.17 & 7.75; TDS found to be between 368 & 789 mg / lit; Dissolved Oxygen found to be between 5.4 & 8.0 mg / lit; BOD found to be between 2.2 & 9.2 mg / lit; COD found to be between 16 & 60 mg / lit; Phosphates 0.05 & 0.70 mg / lit; Total coliform found to be between 20 & 380 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.8 West Tammileru River – Lake inlet:

West Tammileru is also carries domestic sewage of Eluru town & villages and agriculture runoff and drains into Kolleru lake. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 17.

pH value is found to be neutral in nature between 7.39 & 7.84; TDS found to be between 472 & 1008 mg / lit; Dissolved Oxygen found to be between 5.2 & 6.9 mg / lit; BOD found to be between 1.8 & 12 mg / lit; COD found to be between 16 & 88 mg / lit; Phosphates 0.03 & 0.8 mg / lit; Total coliform found to be between 15 & 460 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.9 Chandraiah drain – Lake inlet:

Chandraiah drain originates beyond Gudivada municipality and joins Kolleru lake from its South side. The drain carries domestic sewage of Gudivada town and villages located in the vicinity of the drain. The aquaculture pond effluents also join the drain before confluences with the lake. Water quality of the drain has been

monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 18.

pH value is found to be neutral in nature between 6.58 & 8.19; TDS found to be between 485 & 585 mg / lit; Dissolved Oxygen found to be between 3.5 & 6.8 mg / lit; BOD found to be between 0.8 & 4.0 mg / lit; COD found to be between 12 & 32 mg / lit; Phosphates 0.23 & 1.82 mg / lit; Total coliform found to be between 15 & 240 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.10 Budameru drain – Lake inlet:

Budameru is a rivulet originates from upstream catchment area of Vijayawada city and finally drained into Kolleru lake. Budameru rivulet carries domestic sewage generated from Vijayawada city and other villages located in its vicinity. It also carries aquaculture pond effluents located in its catchment before joining the lake. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 19.

pH value is found to be neutral in nature between 6.93 & 7.75; TDS found to be between 607 & 863 mg / lit; Dissolved Oxygen found to be between 3.0 & 5.6 mg / lit; BOD found to be between 1.4 & 8.6 mg / lit; COD found to be between 8 & 56 mg / lit; Phosphates 0.40 & 1.0 mg / lit; Total coliform found to be between 15 & 210 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.11 Narasannapalem (Arugolanu) drain – Lake inlet:

The drain mainly carries agriculture runoff, domestic sewage from various villages located within its vicinity and aquaculture pond effluents. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 20.

pH value is found to be neutral in nature between 7.17 & 7.74; TDS found to be between 553 & 675 mg / lit; Dissolved Oxygen found to be between 3.7 & 7.3 mg / lit; BOD found to be between 1.2 & 9.2 mg / lit; COD found to be between 8 & 60 mg / lit; Phosphates 0.37 & 0.92 mg / lit; Total coliform found to be between 15 & 460 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.12 Polaraju drain – Lake inlet:

The drain mainly carries agriculture runoff, domestic sewage from various villages located within its vicinity and aquaculture pond effluents and joins the lake at its Southern side. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 21.

pH value is found to be neutral in nature between 7.45 & 8.09; TDS found to be between 582 & 2710 mg / lit; Dissolved Oxygen found to be between 4.5 & 6.7 mg / lit; BOD found to be between 2.3 & 5.4 mg / lit; COD found to be between 28 & 40 mg / lit; Phosphates 0.53 & 1.13 mg / lit; Total coliform found to be between 7 & 240 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.13 Chandraiah drain at Polukonda Village – Lake inlet:

This is the second sampling point on this drain monitored for water quality. This point of sampling is located at Polukonda village just before confluence with lake. Water quality of the drain has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics have been depicted in the Table – 22.

pH value is found to be neutral in nature between 7.37 & 7.92; TDS found to be between 582 & 1016 mg / lit; Dissolved Oxygen found to be between 3.7 & 6.9 mg / lit; BOD found to be between 2.4 & 9.4 mg / lit; COD found to be between 27 &

64 mg / lit; Phosphates 0.40 & 0.99 mg / lit; Total coliform found to be between 11 & 120 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.2.14 Water quality characteristics of outlet:

Water quality of the lone outlet of Kolleru lake at Upputeru has been monitored for the period of six months from August, 2021 to January, 2022. The water characteristics of Upputeru are depicted at Table – 23.

pH value is found to be neutral in nature between 6.96 & 7.90; TDS found to be between 820 & 1860 mg / lit; Dissolved Oxygen found to be between 3.10 & 5.20 mg / lit; BOD found to be between 2.4 & 10.4 mg / lit; COD found to be between 28 & 76 mg / lit; Phosphates 0.54 & 1.0 mg / lit; Total coliform found to be between 11 & 210 MPN / 100 ml and Fecal coliform found to be < 3.0 MPN / 100 ml.

As far as metal concentrations are concerned, none of them have crossed the drinking water standard limits.

3.6.3 Water quality characteristics of Budameru:

As a part of monitoring of inlets of Kolleru lake, APPCB has carried out water quality monitoring of Budameru rivulet at eight (8) locations starting from Vijayawada city till its confluence with Kolleru lake during January, 2022. Water quality characteristics have been depicted at Table – 24.

pH value at all the locations is found to be neutral in nature between 6.93 & 7.34; TDS found to be between 627 to 903 mg / lit; Dissolved Oxygen found to be between zero (Nil) & 3.8 mg / lit; BOD found to be between 6.8 & 12.2 mg / lit; COD found to be between 56 & 88 mg / lit; Phosphates 0.09 & 1.18 mg / lit; Total coliform found to be between 1100 & > 2400 MPN / 100 ml and Fecal coliform found to be between 39 & 75 MPN / 100 ml.

Hence, the water following in the Budameru rivulet is not fit for drinking (Class 'A'& 'C'), bathing purpose (Class 'B'), Propogation of wildlife & fisheries (Class 'D') as per the CPCB classification criteria for designated best use.

Analysis results of the Kolleru lake inlets, drains and lone outlet - *Annexure – 4* & Analysis reports – *Annexure - 5*. CPCB classification of water quality criteria for designated best use – *Annexure – 6* & drinking water standards – IS 10500:2012 – *Annexure - 7*.

3.7 Interpretation of results:

3.7.1 The neutral pH value of all the locations of lake, inlets and outlet suggests that acidic or alkaline effluents are not joining the lake.

3.7.2 The analysis results of lake points obtained during the period of six months from August, 2021 to January, 2022 suggest that there is no consistency in the values of DO, BOD & TDS in the same location and varying place to place within the lake. This could be because of varying amounts of rain fall in the catchments of various inlet drains and varying amounts of organic and inorganic contaminants joining the lake.

3.7.3 DO values in the lake observed to be between zero (nil) & 8.40 mg/lit and BOD values found to be between 0.8 & 20.2 mg/lit. The low values of DO (<4.0 mg/lit), high values of BOD (>3.0 mg/lit) at certain times at certain locations and presence of water soluble phosphates within the lake is attributed to the joining of untreated domestic sewage and aqua culture pond effluents into the lake through various inlet streams and drains. Domestic sewage is entering the lake mainly from Vijayawada city through Budameru rivulet, Eluru town through East & West Tammileru rivulets and Gudivada town through Chandrayya drain. Apart from these major Urban Local Bodies, Domestic sewage from various villages located in the vicinity of these inlet drains and effluents of thousands of aqua culture ponds located in the periphery and within the lake are also responsible for low DO and high BOD contents in the lake.

3.7.4 However, these domestic and aqua culture pond effluents are either getting diluted with rain water during monsoon season or getting self purified while flowing in the drains.

3.7.5 Low values of DO (<4.0 mg/lit) and high values of BOD (>3.0 mg/lit) at times and at certain locations as observed during the six months period monitoring rendering the lake water unfit for potable purpose (Class A & C), bathing purpose Class B and propagation of wildlife and fisheries (Class D).

3.7.6 Growth of water hyacinth within the lake portions indicate that the lake is enriched with plant nutrients like Nitrogen & Phosphorous. However, it is a good sign that lake water does not contain appreciable amount of toxic metal and the concentrations of metals are not exceeding the acceptable and permissible standard of drinking water (IS: 10500:2012).

3.7.7 Further, the lake water or the lake sediments does not contain the organocloro or organo phosphorous pesticide residues even in detectable concentrations. May be because of dilution affect and flushing out these contaminants through flooding during monsoon season.

4. Observations made during water quality monitoring of Kolleru lake and its inlets:

4.1 The three months August, September & October being monsoon season and continued the rainy season upto 1st week of December, 2021, the lake and all the inlets found to be with full of water to its brim.

4.2 Dumping of Municipal Solid Waste along and inside into the inlet drains of the lake was observed wherever the villages and towns are located.

4.3 Discharge of domestic sewage from towns & villages into the inlet drains of the lake was observed at several locations. Photographs pertaining to discharge of domestic sewage & dumping of Municipal Solid Waste into the Budameru rivulet, one of the main feeder channel for Kolleru lake at various locations staring from Vijayawada city till its confluence with Kolleru lake attached (**Photographs – 26 to 30**).

4.4 Discharge of untreated domestic sewage into the lake by almost all the bed villages and peripheral villages polluting the lake water (**Photograph – 4**). These villages have not been provided with sewage treatment systems of any kind.

4.5 Dumping of Municipal Solid Waste and Construction & Demolition Waste into the lake or all along the roads at village points were observed (**Photographs – 2, 3, 4, 5, 6, 7, 8 & 23**).

4.6 Some of the bed & peripheral villages have been provided with compost making sheds. But, they are found kept unused for the said purpose (**Photograph – 1**).

4.7 Heavy growth of water hyacinth on the lake water was observed at Chinayedlagadi, Pedayedlagadi, Gudivakalanka, Kokkirayalanka, Chettunnapadu and Kolleti kota, which indicates that the water at these locations is enriched with plant nutrients like

Nitrogen & Phosphorous through domestic sewage & aquaculture pond discharges into the lake various drains (**Photographs – 20 to 23**).

4.8 Traditional methods of fishing using mavus and nets of size which does not cause damage to seed but catches the fish of harvestable size was observed. Ordinary boats without motors for the movement of people within the lake were observed at certain locations.

4.9 It was observed that thousands of aquaculture ponds located on almost all sides of the lake and at villages located within the lake at Gudivakalanka, Kokkirayalanka, Chettunnapadu, Penchikalamarru, Kolleti kota, etc. It is also difficult to ascertain whether these aquaculture ponds within the bed and periphery of the lake are authorized ones.

4.10 None of these aquaculture ponds have systems for treatment of spent effluents before discharging into the various drains leading into Kolleru lake.

5. Sources of pollution identified:

During the monitoring of six months period from August, 2021 to January, 2022, it was observed that mainly:

5.1 The domestic sewage originating from Vijayawada city through Budameru rivulet which is one of the main feeder channel to Kolleru lake. Untreated domestic sewage is joining the Budameru at several locations starting from Vijayawada city till the confluence point with the lake (**photographs - 26 to 30**).

Vijayawada Municipal Corporation generates about 149 MLD of sewage and has treatment facilities to treat 130 MLD located at Ramalineshnagar, Ajithsingh nagar and Jakkampudi. Further, STP having a capacity of 20 MLD is under construction at Jakkampudi.

5.2 Eluru town, which is the district head quarter for West Godavari district generates about 26 MLD domestic sewage and all the domestic sewage is finding its way into the East & West Tammileru rivulets and finally joins Kolleru lake. Presently, the Eluru Urban Local Body is constructing one STP with a capacity to treat 5 MLD domestic sewage.

5.3 Gudivada town which generates about 10 MLD domestic sewage is also does not have treatment facilities at its disposal. The domestic sewage generated by this town is

finding its way into the Kolleru lake through the Chandrayya drain.

5.4 Thousands of aqua culture ponds are located in the periphery surrounding the lakes all sides and within the lake area does not have treatment systems for treatment of aqua culture pond effluents and all these untreated effluents are finding their way into the lake through various drains.

5.5 There are 122 villages inside the sanctuary area (46 bed villages and 76 belt villages) and none of the village is having treatment systems for treatment of domestic sewage and the same is finding its way into the Kolleru lake. Some of the villages are provided with compost making sheds, but, none of the sheds have been put into use (**Photograph - 1**).

5.6 Apart from Vijayawada, Eluru and Gudivada ULBs, there are several villages located in the vicinity of various inlet drains and the domestic sewage generated by this villages is also finding its way into the lake.

6. Industrial pollution – status:

No industrial effluents are joining either into the inlet drains of Kolleru lake or directly into the lake. APPCB is not issuing consents / permissions to any industry to discharge untreated / treated effluents outside the industry premises or into any drains / channels within the 10 kms radius from +5 contour of Kolleru wildlife sanctuary.

APPCB is also not permitting any new industry establishment to set up within the 10 km radius from +5 contour of Kolleru wildlife sanctuary.

7. Water quality management of Kolleru lake - Wetland International-South Asia (WISA), 2008 Plan:

The Integrated Management Plan for Kolleru Wildlife Sanctuary was prepared by Wetland International-South Asia (WISA), 2008 under an assignment from Forest Department, Government of Andhra Pradesh has made certain recommendations to improve the water quality of Kolleru lake:

7.1 Domestic sewage generated by the towns and villages is joining the lake directly or indirectly through various inlet channels resulting in near eutrophic conditions in the lake seriously jeopardizing its natural assimilation. Development of domestic sewage management system in these towns and villages including located in the lake bed and allowing only properly treated water to enter the lake to maintain the water quality to

its designated best use.

7.2 Management of municipal solid and construction & demolition wastes in and around urban local bodies and villages including located in the lake bed as per the relevant rules of the Environment (Protection) Act, 1986.

7.3 Providing low-cost sanitation systems for the public living in the peripheral and lake bed villages.

7.4 Control of diffused pollution through wetland technology for the removal of contaminants from the water in order to decrease the possibility of detrimental impacts on humans and aquatic ecosystem. Many contaminants, including a wide variety of organic compounds and metals, are toxic to humans and other organisms.

Source: *Department of Forest, Govt. of Andhra Pradesh report dated 02.11.2021.*

8. Azeez Committee report on the proposal for downsizing the Kolleru Wildlife Sanctuary (+5 to +3 feet contour), 2011:

Ministry of Environment and Forest (MoEF), Government of India (GoI) constituted this committee to look into the issue of downsizing the Kolleru Wildlife Sanctuary (+5 to +3 feet contour). Recommendations of Azeez Committee on Pollution management of Kolleru Lake:

8.1 Identify area of major pollution sources (e.g., Rechacode, Budameru side – 'A' and make appropriate means for treatment of the effluents before they reach Kolleru lake. Also to consider diverting the effluents away from the Kolleru lake.

8.2 Appropriate treatment plants need to be established to clean up water flowing to all streams carrying pollutants from various sources. In case found necessary, the stream Budameru may be diverted from the lake to empty into the sea directly through another drain or Krishna river.

8.3 Industrial waste waters entering Chandraiah drain joining Kolleru Lake should be diverted to the sea through Mullapudi drain.

8.4 Industries should be enforced to install Effluent Treatment Plants (ETP). It is also to be ensured that the ETPs functions properly. Stringent action should be taken including closure of the polluting industries and penalization, if cleaning their effluents is not affected.

8.5 There should be continuous monitoring of water quality of the lake, preferably with cooperation from the locals.

8.6 The Municipalities also should be forced to manage their wastes, to build ETPs and to execute scientific means to dispose of their solid wastes. Appropriate measures should be taken to force the three municipalities to build and operate ETPs for treatment of sewerage entering the lake.

8.7 Local authorities of the towns and villages along the drains and channels should be compelled to provide collection and treatment systems for sewage by extending financial help.

8.8 Discharges from the fishponds above +5 contour should be stopped and the farms may be forced to build and operate ETPs for treating their water, at their own cost. In case of failure, action should be taken to demolish the fishponds.

Source: *Department of Forest, Govt. of Andhra Pradesh report dated 02.11.2021.*

9. Recommendations:

The following recommendations have been submitted to improve and maintain the water quality of Kolleru lake Class A category of CPCB specified criteria for designated best use with the characteristics, pH between 6.5 and 8.5; dissolved oxygen 6.0 mg/lit or more BOD; 2.0 mg/lit or less and Total Coliform 50 MPN/100 ml or less:

9.1 Municipal corporations, Vijayawada & Eluru and Municipality, Gudivada shall ensure that no domestic sewage or the municipal solid waste is discharged / dumped in the Budameru, East & West Tammileru rivulets and Chandrayya drain. These ULBs shall provide facilities for interception & diversion of entire domestic sewage and treatment. Only treated sewage shall either be disposed into the respective streams or shall be utilized for gardening or industrial purposes – Action to be initiated by the concerned ULBs and MA&UD Department.

9.2 Provision of treatment facilities for domestic sewage, domestic solid waste and construction & demolition waste in all the villages located in the vicinity of various inlet streams & drains and in the 122 bed & peripheral villages of Kolleru lake to ensure that only treated domestic sewage joins the lake – Action to be initiated by the district Panchayat offices and PR&RD Department.

9.3 Provision of treatment facilities for the aqua culture pond effluents to ensure that only

treated effluents only joins the Kolleru lake. Creation of awareness among the aquaculture formers on the use of feed and antibiotics to ensure prevention of excessive usage – Action to be initiated by the Fisheries Department.

9.4 To ensure no industrial effluent (treated or untreated) is discharged into the inlet streams & drains or into the lake – Action to be initiated by APPCB.

9.5 Continue to monitor water quality of all the inlet streams / drains, lake points and outlet for the characteristics including toxic metals and pesticide residues in future also – Action to be initiated by APPCB.

9.6 Creation of awareness among the farmers on the use of fertilizers and pesticides to ensure prevention of excessive use and usage of banned pesticides in the lake catchment. Inventorisation of pesticides (organo-chloro, organo-phosphorus, carbamates, etc.) and fertilizers used in the catchment of Kolleru lake – Action to be initiated by the Agriculture Department.

9.7 As there were allegations that the lake is subjected to encroachments, drawing of clear cut lake boundary on the field upto its +5 contour for identification of unauthorized encroachments of the Kolleru wildlife sanctuary and for identification of unauthorized establishments of aqua culture ponds and for their removal – Action to be initiated by Forest Department.

9.8 The subject of improvement of water quality of Kolleru lake involves various Stakeholder Departments like, MA&UD, PR&RD, EFS&T, Fisheries and Agriculture. Hence, it is suggested to constitute a team with the officials from the above Stakeholder Departments to formulate action plan for improvement of water quality of the lake to Class 'A' level.

Date: 15.02.2022,

Place: Vijayawada.

K. Srinivas

K. Srinivas
Joint Chief Environmental Scientist (FAC)
Andhra Pradesh Pollution Control Board
Vijayawada.

Item No. 12 & 13:

BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

Original Application No.259 of 2020 (SZ)
With
Original Application No.02 of 2021 (SZ)

(Through Video Conference)

IN THE MATTER OF

Tribunal on its own motion
Suo Motu based on the news item in
The Indian Express, Newspaper dt. 09.12.2020,
"Andhra town Eluru hit by 'mystery' illness,
Traces of lead, nickel in blood samples",
News item in The Time of India, Newspaper
Dt. 08.12.2020, "Heavy metal content in water
Caused mysterious disease in Andhra Pradesh" &
News item in NDTV, dt. 09.12.2020,
"Lead, Nickel found in blood of people with
Mystery illness in Andhra"

...Applicant(s)

Versus

The Chief Secretary of Govt. of Andhra Pradesh

And Ors.

…Respondent(s)

With

Tribunal on its own motion
Suo Motu based on the news item in
The Hindu, edition dated 15.12.2020,
"Kolleru (West Godavari Dt.) "Mystery illness raises
Concerns over Kolleru Pollution"

...Applicant(s)

Versus

The Chief Secretary to Govt. of Andhra Pradesh,

Andhra Pradesh and Ors.

…Respondent(s)

Date of hearing: 07.06.2021.

CORAM:

HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER

HON'BLE MR. Dr. K. SATYAGOPAL, EXPERT MEMBER

O.A. No.259/2020:

For Applicant(s): Suo Motu by Court.

For Respondent(s): Mrs. Madhuri Donti Reddy for R1 to R7.

O.A. No.02/2021:

For Applicant(s): Suo Motu by Court.

For Respondent(s): Mrs. Madhuri Donti Reddy for R1 to R8.

ORDER

1. The above two cases have been Suo Motu registered by this Tribunal on the basis of the newspaper reports published in The Indian Express dated, 09.12.2020 and also in The Times of India dated, 08.12.2020 under the caption ***"Andhra Town Eluru hit by 'mystery' illness, traces of Lead, Nickel in blood samples"***, ***"Heavy metal content in water caused mysterious disease in Andhra Pradesh"*** respectively and a news item

published in NDTV dated 09.12.2020 under the caption ***"Lead, Nickel found in blood of people with mystery illness in Andhra Pradesh"*** and also in The Hindu dated 15.12.2020 under the caption ***"Mystery illness raises concerns over Kolleru Pollution"***.

2. Further, this Tribunal also considered the directions given by the Principal Bench of National Green Tribunal, New Delhi in ***O.A. No.176 of 2019 (A.P. Chandrashekar Vs. State of Andhra Pradesh & Ors.)*** dated, 05.01.2021 in respect of the alleged pollution in Kolleru Lake and on the basis of the report submitted by the District Magistrate, Machilipatnam of Krishna District, the Principal Bench had disposed of the matter and it is not known as to whether the recommendations made by the District Magistrate in that case has been implemented or not.

3. Since the learned counsel appearing for the State respondents in both the cases submitted that the State of Andhra Pradesh had already appointed a high level committee to go into the question and certain reports have been obtained and on that basis, steps will be taken to redress the issue, this Tribunal has not appointed any separate committee to go into the question.

4. When the matter came up for hearing today through Video Conference, Mrs. Madhuri Donti Reddy represented respondents 1 to 7 in O.A. No.259/2020 and respondents 1 to 8 in O.A. No.02/2021.

5. In O.A. No.259/2020, the Andhra Pradesh Pollution Control Board had submitted a status report dated 12.01.2021 which reads as follows:-

"Report submitted by Andhra Pradesh Pollution Control Board in pursuance to the order dated 16.12.2020 in O.A. No.259 of 2020 passed by the Hon'ble National Green Tribunal, Southern Bench, Chennai.

Introduction: The present report is submitted in pursuance to the order dt. 16.12.2020 of this Hon'ble Tribunal in O.A. No. 259 of 2020, whereby SUO - MOTU notice was issued to the Andhra Pradesh Pollution Control Board "APPCB" hereinafter and the Board was directed to file a report.

The Chairman, Andhra Pradesh Pollution Control Board (APPCB) is respondent No. 4.

The APPCB is primarily submitting the present report submitting the following:

Details of the incident:

An unusual incident occurred in Eluru town on the evening of 05.12.2020, leading to sudden hospitalization of people residing in the region, exhibiting symptoms of convulsions, vomiting, drowsiness etc.

II. Monitoring conducted by APPCB & its inferences:

1. APPCB officials carried out ambient air quality monitoring on 06.12.2020 at the following locations to assess the ambient air concentrations of PM_{10}, SO_2, NO_2, Ammonia and Heavy metals.

a) Sanivarapupeta, Eluru municipality

b) Dakshinapuveedhi, Eluru municipality

c) Vangayagudem, Eluru municipality

The analysis results are enclosed as Annexure - I. The following inferences were drawn from the results:

The ambient air concentrations of PM_{10}, SO_2, NO_2 & NH_3 were observed to be within the limits of NAAQ Standards.

Heavy metal concentrations of Lead, Nickel and Arsenic in particulate matter were also within the limit of NAAQS.

2. APPCB officials also carried out Surface Water

sampling on 06.12.2020 from the following locations, to assess the quality of the surface water, which are the primary sources of drinking water supply to Eluru town.

a) Reservoir (Godavari Water) (Water supply for Eluru Municipality) near Denduluru

b) Pampulacheruvu Outlet, Eluru Municipality

c) Kotadibba Water Tank, Eluru Municipality

d) J.P. Colony Water Tank, Eluru Municipality

e) Gandhi Colony Water Tank, Eluru Municipality

f) Panchyathi Water Tank, ZP High School, Sanivarapupeta, Eluru

g) Ashok Chakaram Road, 6B - 11-20, Eluru

h) Ashok Chakaram Road, 6A - 12 -20, Eluru

i) D.No.6A - 11-21, Vadiragudem, Eluru

j) D.No.6A - 11-31, Vadiragudem, Eluru

k) Krishna Canal, near Pampala Cheruvu

l) Pond - 1 of Pampala Cheruvu

m) Pond - 2 of Pampala Cheruvu

The analysis results are enclosed as Annexure - II. The following inferences were drawn from the results:

<u>Physicochemical analysis:</u>

The analysis results for physico - chemical parameters viz., pH, Dissolved oxygen, COD, TDS, Chlorides, Hardness, Calcium, Magnesium, Alkalinity, Phosphates, Sulphates, Fluoride, Nitrates and Ammonia were observed to be normal.

<u>Heavy metal analysis:</u>

Heavy metal analysis was carried out for Nickel, Arsenic, Lead, Chromium, Iron, Copper, Zinc and Cadmium and the results are within norms except Iron reported to be 2.18 mg/lt at pond - 2 of Pampula cheruvu against the standard of 0.3 mg/lt.

3. As per the instructions of the Administration, West Godavari District and Commissioner, Health & Family Welfare, Govt. of AP, the officials of APPCB again collected surface water samples on 08.12.2020 from the following locations for the complete analysis of physicochemical parameters, heavy metals, Bacteriological and pesticides.

a) Eluru Canal (Godavari Water) near Denduluru (V & M)

b) Reservoir (Godavari Water- Water supply from Eluru Municipal Corporation), near Denduluru (V & M)

c) Intake well of water treatment plant (Godavari water) of Eluru Municipal Corporation

d) Treated water sample collected before chlorination

e) Treated water sample collected after chlorination

f) Treated water sample collected Kotadibba water tank

g) H/o Sri Vemula Gopiah, D.No: 6A-11-31, Vadiragudem, 5th Division

h) Krishna Canal, Near Postal Colony

i) Pond - 1 of Pampula Cheruvu, Eluru Municipal Corporation

j) Pond - 2 of Pampula Cheruvu, Eluru Municipal Corporation.

The analysis results are enclosed as Annexure - III. The following inferences were drawn from the results:

Physicochemical analysis:

The analysis results for physico - chemical parameters viz., pH, Turbidity, Dissolved oxygen, COD, TDS, Chlorides, Hardness, Calcium, Magnesium, Alkalinity, Phosphates, Sulphates, Fluoride, Nitrates and Ammonia were observed to be normal.

Heavy metal analysis:

Heavy metal analysis was carried out for Nickel, Arsenic, Lead, Chromium, Iron, Copper, Zinc, Cadmium, Mercury, Barium, Aluminium, Manganese and Silver.

Concentration The concentration of Lead in Kotadibba water tank (overhead tanks) was observed to be 0.0174 mg / l which is slightly higher than the standard of 0.010 mg/l.

The concentration of Mercury in Eluru canal was observed to be 0.0011 mg/l which is slightly higher than the standard of 0.0010 mg / l.

Organo Chlorine Pesticides:

Analysis was carried out for residues of Organochlorine pesticide namely Alpha - BHC, Beta - BHC, Gamma - BHC, 4,4'

- DDD, 4,4'DDE, 4,4'DDT, Aldrin, Dieldrin, Endosulphan - 1, Endosulphan Sulphate, Endrin, Heptachlor, Heptachlor Epoxide, Methoxychlor, Endosulphon II, Delta - BHC and Endrin aldehyde.

No traces of organochlorine pesticides were detected in surface water samples.

Bacteriological Analysis:

Analysis was carried out for the presence of T-Coli & F - Coli bacteria.

In treated water samples, the T - Coli & F - Coli bacteria were absent.

4. APPCB officials carried out simultaneous sampling of Ground Water at the following locations during the visit of NEERI officials on 12.12.2020.

a) H/o D.No.6A-11-17, Dakshinapuveedhi.

b) Near Varasiddi Vinayaka Temple, Kothapeta.

c) H/o S. Nageswararao, Thurupuveedhi.

d) H/o D.No.38-5-7, Padmaraveedhi.

e) Near Graveyard, Tangellamudi, Thurupuveedhi.

f) H/o D.No.2-11-7 / 2, S. Satyanarayana house.

g) H/o D.No.17-3-4, Md. Saleem house, Vangayagudem.

h) At DFC Food Court, RR Peta.

i) Agri gold Apartment, Pathebadh.

j) H/o D.No.21-379, Ponangi.

The analysis results are enclosed as Annexure - IV. The following inferences were drawn from the results:

Physicochemical analysis:

The analysis results for physico - chemical parameters viz., pH, Turbidity, TDS, Chlorides, Hardness, Calcium, Magnesium, Alkalinity, Phosphates, Sulphates, Fluoride, Nitrates and Ammonia were observed to be normal.

Heavy metal analysis:

Heavy metal analysis was carried out for Nickel, Arsenic, Lead, Chromium, Iron, Copper, Zinc, Cadmium, Mercury Barium, Aluminium, Manganese and Silver.

The concentration of Manganese in Turupuveedhi was

observed to be 1.495 mg/l which is higher than the standard of 0.1 mg/1.

The concentration of Mercury in RR Peta was observed to be 0.0012 mg / l which is slightly higher than the standard of 0.0010 mg / 1.

Organochlorine Pesticides:

Analysis was carried out for residues of Organochlorine pesticide namely Alpha - BHC, Bela - BHC, Gamma - BHC, 4,4' - DDD, 4,4'DDE 4,4' DDT, Aldrin, Dieldrin, Endosulphan - 1 Endosulphan Sulphate, Endrin Heptachlor, Heptachlor Epoxide, Methoxychlor, Endosulphon - II, Delta - BHC and Endrin aldehyde.

No traces of organochlorine pesticides were detected in surface water samples.

III. Study conducted by CSIR - NEERI, Hyderabad and its inferences:

APPCB entrusted the study of air and water quality in and around the affected areas of Eluru to CSIR - NEERI, Hyderabad. The CSIR - NEERI carried out the studies during the period from 10.12.2020 to 12.12.2020. The CSIR - NEERI submitted the report on 21.12.2020, which is enclosed as Annexure - V.

The CSIR - NEERI in their report stated that:

Ambient Air Quality:

In the ambient air quality study it is found that the concentrations of particulate matter were found to be high and exceeding the NAAQS largely in the study area. Higher values of particulate matter may be due to vehicular traffic, re - suspended road dust, burning of solid waste, windblown dust and agricultural and construction activities. Gaseous pollutants are found to be very low and not significant.

The heavy metals in the particulate matter are found to be higher in terms of arsenic, boron, copper and zinc.

The arsenic concentrations in the particulate matter are exceeding the NAAQS at all locations except at Pattebada. Higher levels of these may be due to vehicle transportation, waste incineration or burning, oil and coal

combustion, sewage sludge incineration, and construction activities.

Ground and Surface water Quality:

The overall water quality for Surface and Ground water is satisfactory. In terms of heavy metals, Iron and Manganese were found to be slightly higher than BIS Standards for Drinking which may be due to geological Origin.

Presence of Mercury in Surface and Ground water is alarming and it needs deeper scientific study to ascertain the reasons for high levels of Mercury

Organochlorine pesticides like Alpha - HCH, Beta - HCH. Gamma - HCH, Delta - HCH, Aldrin, Dicofol, Alpha endosulfan, pp - DDE pp '- DDD Beta - Endosulfan, Endosulfan Sulfate, Heptachlor. Heptachlor epoxide were analyzed in groundwater and surface water samples and the concentration of all compounds were observed to be below detectable level. Similarly, organophophate pesticides and herbicides including Phorate, Dimethoate, Fluchloralin, Parathion Methyl, Alachlor, Malathion, Chloropyrifos, Pendimethalin, Butachlor, Profenofos, Quinalfos and Ethion were analyzed and found below detectable levels in all samples except for choloropyrifos in ground water.

Soil Quality:

The texture of most of the soil sample collected is sandy clay loam with moderately fine texture ranging moderate to strong Alkaline pH. The soils are having low CEC with Normal ESP.

The heavy metal concentrations in the study area are below Screening and response levels as per MoEF & CC Guidance Document for assessment and remediation of Contaminated sites in India.

Organochlorine and organophosphate pesticides concentration in soil samples were observed to be below detectable level.

Remarks:

1. As mentioned in the news papers the suspected cause for the incident reported by the All India Institute of Medical

Sciences (AIMS) 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 / 1.

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 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 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. (Annexure - VI)

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.

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

6. It is seen from the remarks that high level mercury was found in certain areas as per the report submitted by the CSIR, NEERI and other heavy metal concentrations were also found in the surface and ground water.

7. The Andhra Pradesh Pollution Control Board also filed another status report dated Nil e-filed on 17.02.2021 and received on 19.02.2021, wherein, they have reported as follows:-

> ***"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 acresupto +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*
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 "KolleruWildlife 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. Action taken by APPCB:

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) Bulusuvagu 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) Gudivakalanka bridge.

2) Kokkirayalanka 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 were meeting the drinking water standards of ISI0500:2012. 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 Chennai Technology) to investigate the source of episode on long term basis and to suggest remedial measures to prevent reoccurrence 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 pesticides residues beyond standards was observed. Further, no industrial discharges are allowed in to Kolleru Lake. The Hon'ble NGT disposed O.A. 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 and 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 into 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 Wildlife & 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."

8. It is very surprising to see from the report that no industrial effluents are joining in Kolleru Lake though large number of reports have alleged that industrial effluents are being discharged into the lake. It is also reported that the lake water is not the drinking water source to any of the villages, as it falls under Class - D as per CPCB Primary Water Quality criteria and it is suitable for propagation of wildlife and fisheries only. It is also mentioned in the report that no cases were registered around the Kolleru lake area.

9. It may be mentioned here that water bodies are intended for using it not only for the drinking purpose but also for irrigation purpose. It is understood that Kolleru Lake is one of the largest fresh water lake in

Andhra Pradesh. If that be the case, the authorities are expected to maintain the lake and improve the water quality into either Category - A or Category - B, instead of keeping in the Category - D.

10. Nothing is mentioned in the report regarding the steps taken by the authorities for improving the water quality, when it is the biggest fresh water body available in the Andhra Pradesh and it is also mentioned in the report itself that it is one of the largest fresh water ecosystem (wet land) in India of international importance recognized under the Ramsar Convention. If that be the case, there is a responsibility cast on the authorities to take steps to improve the water quality and make use of the same for drinking and irrigation purposes as well, so as to protect the water body and quality of the water.

11. When this was pointed out, the learned counsel appearing for the State departments submitted that they will come with a further action taken report or any plan for the State Government to improve the water quality in that lake. The APPCB should also file a factual report on the pollution of Kolleru lake caused by Industries, Agricultural operations & sewage discharge. They are expected to carry out the analysis scientifically by collecting the samples at (1) inlets and outlets of the Industrial zones which are ultimately draining into the Kolleru Lake, (2) confluence points of major drains into the Kolleru Lake – surface water samples and sediment

samples to be tested, (3) in case any settling ponds have been established prior to the joining of the drains into the lake, then samples of both surface water and the sediments in the settling ponds should be tested. The APPCB is expected to undertake the study comprehensively and not resort to filing a report based on cursory studies. The report has to be approved by the Chairman prior to submission.

12. As regards the report of the committee is concerned, the State of Andhra Pradesh has filed a report of the multi disciplinary committee dated Nil e-filed on 30.03.2021 and received on 31.03.2021 wherein, after making lot of discussion, source of the outbreak and recommendations have been made which reads as follows:-

> *"SOURCE OF THE OUTBREAK*
>
> *According to the experts, toxins are likely to be the most probable cause of this outbreak Among the toxins, the pesticides are most likely to present similar encephalopathy. Among pesticides also, organo - chlorides are most likely to be the cause of the outbreak.*
>
> *From the epidemic curve with a sudden onset on 4 December and steep rise, peaking was observed between 5th and 7th December. Subsequently the cases started declining from the 8th onwards. There was no case reported from 130 December onwards. After analyzing the above epidemic curve, case sheets of the patients, reports from different labs and inputs from different expert agencies involved, it can be categorized as a point source outbreak which was non-propagative in nature. It was a case of acute exposure to a substance rather being a chronic one. It is indicative of a common single exposure*

source. Another important observation is that whatever was the source is no more there in the system as no case has been reported 13th December onwards.

The likely source of such kind of encephalopathy can be water, milk, vegetables and fruits. Nickel was found in Milk, but nickel cannot cause such encephalopathy and hence can be ruled out. The source cannot be meat or fish as 87% of the patients did not consume non vegetarian food in the last couple of days prior to the incident. Vegetables like tomato and brinjal have been found with Metribuzin (herbicide). But had it been the source, the geographical expanse would not have been confined to urban area alone. It would have spread to rural areas as well. So vegetables can be the source only if some contamination occurred after the arrival of the vegetables to the market in Eluru and the vegetables got contaminated after the stock arrived in the market.

Coming to the likelihood of water being the source of contamination. None of the agencies have reported the presence of organo - chlorines in the water samples taken from the source, reservoir and the storage tank. So the central water supply was clean. The water samples collected from the households had some presence of Triazophos (organo phosphate compound) but the concentration was not too high and also the control samples also found the presence of Triazophos. Thus, contamination of water locally being the source cannot be substantiated or ruled out either. This requires a detailed study of the water supply system of Eluru municipal corporation over the next few months to arrive at a conclusion.

Thus there is a need of involving reputed national Institutions like AIIMS, IICT, NEERI on a long term basis to find out the exact source and also to prevent the event from reoccurring. The teams will make a deep - dive to unearth the most likely source of the episode. It would require systematic sampling of all likely culprits from origin to human consumption.

Since water test results from all agencies indicated that there is no presence of heavy metals or pesticides beyond the allowed limits, it can be safely said that the present water supply is potable and safe for Human Consumption.

RECOMMENDATIONS

The Committee, after several rounds of in depth deliberations, arrived at several recommendations which can be broadly categorized as short term action strategies and long term preventive strategy.

The preventive strategy will involve following:

1. Involving reputed national Institutions like AIIMS, IICT, NEERI on a long - term basis by the District Administration. The teams will make a deep - dive to understand further the nature of the episode. It would require systematic sampling of all likely sources from origin to human consumption. Water food air and sail analysis on a long term basis need to be done with a proper research design and sample design. Data collected needs to be analyzed to arrive at a long term strategy. The study must go beyond the Eluru city and shall include the west Godavari and East Godavari districts due to the similar nature of topography irrigation and agro climatic conditions. Teams from AIIMS, New Delhi, IICT Hyderabad, PHFI with its Indian Institute of Public Health, Hyderabad would conduct these studies which shall be assisted by the District Collectors.

2. A Multidisciplinary Health and Environment Monitoring Framework need to be developed for these studies. A Monitoring cell for this purpose will be opened under the aegis of EFS & T department with representation (not below the cadre of Joint Director) from department of Health, Agriculture, Environment, Animal Husbandry and Municipal administration. All line departments shall give necessary assistance to this multi-agency, multi-disciplinary team.

3. A high level committee under the Chairpersonship of Chief Secretary to the government may be set up with senior officers from department of Health, Agriculture, Environment, Animal Husbandry, Irrigation and Municipal administration.

4. This high level committee shall get action plans prepared by all the line departments for monitoring water, food, air, soil, Agriculture, Aquaculture residues etc. on a regular basis. Further, the implementation of these action plans shall be monitored by the High level committee constituted.

5. Surveillance plan of action for identifying source of heavy metals in blood in Eluru Municipal Corporation area needs to be developed by the municipal department in co - ordination with the Andhra Pradesh Pollution Control Board. A statistical database with periodical updating needs to be developed for items like water supply including both surface and ground water at all possible tapping points. All food sources shall also be closely monitored for heavy metals. Further industrial sources including sewerage and solid waste management practices of the Eluru corporation shall be closely monitored for finding out and eradicating presence of heavy metal in the human beings in Eluru area. This activity shall be coordinated by the AP Pollution Control Board.

6. A broad study of the entire West Godavari district with regards to above parameters is required for a comparative study with Eluru Municipal Corporation area. If required both districts of East and West Godavari shall be included in these studies. The AP Pollution Control Board shall undertake this study in coordination with Municipal corporation, Eluru.

7. Since the pesticides are likely to contribute to such episodes, it is very crucial that the banned compounds like DDT, DDE Endosulfan should not reach up to the agricultural fields. Strict implementation by the regulatory authorities is required for this. Department of Agriculture is advised to submit a detailed action plan within one month to achieve this goal.

8. Promotion of organic and nature - based farming should find key place in the agricultural policy. ZBNF wing of agriculture department to identify all villages in and around Eluru Municipal Corporation area for promoting agriculture of vegetables following the organic farming methods. Dedicated outlets to be opened in Eluru Municipal Corporation area for marketing and sale of the organically grown products. Department of Agriculture should also submit a detailed action plan for this within one month.

9. Surveillance plan of action for monitoring the quality of milk needs to be developed by the Animal Husbandry department within one month.

10. Usage of Chemicals for Aqua farming in areas surrounding the Eluru city needs to be reduced in the long run by the fisheries department. Surveillance plan of action for monitoring the aquaculture in the west Godavari district to identify and stop usage of any banned products needs to be developed by the fisheries department within one month.

11. Setting up of state of art labs at Vizag, Guntur and Tirupati under the aegis of Health Department. These labs should have the capacity to detect all kinds of organo - chlorines and organo - phosphates in all mediums like water, food, blood, serum etc. They should also be able to detect all kinds of heavy metals especially lead, nickel, and mercury etc. in all mediums like blood, blood serum, water milk and vegetables etc. Further each district also should have one lab for water and food analysis. Samples from different sources, establishments and locations in the entire state need to be randomly checked periodically in these labs. A scientific matrix of sampling needs to be evolved so that regular surveillance on food materials and water is maintained in the district labs. Regional labs should have advanced facilities at par with research institute labs for testing blood and serum.

12. Irrigation Department should take up detailed study to identify possible sources of contaminants / Pollutants in Eluru canal at the earliest.

The steps to be taken up in the short term for immediate action are detailed below

1. Irrigation Department should take up cleaning of the Eluru Canal immediately and also submit an action plan ensuring prevention of car wash and battery residues in the Eluru Canal within one month.

2. The municipal water supply management forms the cornerstone. Regular testing along with documentation needs to be ensured. While the water samples tested by the MA & UD indicated that the water supplied by Eluru Municipal Corporation is safe and as per standard, periodic checking must be ensured to rule out any contaminants. Similar system must be brought in place for all municipal water supply systems in the State.

3. The municipal water quality needs to be checked for more parameters like organo - chlorines and organo - phosphates on a periodical basis. Currently the water samples are checked for certain parameters like TDS etc. only.

4. Stand - alone RO units should also be checked for presence of heavy metals in water used by Institute for Preventive Medicine (IPM), AP Vijayawada.

5. Solid Waste management in Eluru needs to be analyzed for any likelihood of heavy metals leeching into the soil and then reaching to the human food chain through ground water. This task shall be taken up by the Municipal Administration and Urban Development (MA & UD) department.

6. Periodical inspections of prominent Rythu-bazaars and market places and sample collection for heavy metals and

pesticides presence should be taken up by the Marketing department.

7. Entire distribution network including pumps, ESLR's and pipelines should be thoroughly checked for material integrity and the same should be done on a regular basis in future. Steps should be taken to keep the entire system under positive pressure at all times in the future. This should be done by the Municipal Administration and Urban Development (MA&UD) department.

8. Testing of pesticides/ weedicides/ fertilizers etc. being used in the district must be taken up by Agriculture Department to ensure proper quality."

13. Certain short term and long term measures were also provided to meet the situation and also identified the possible source of contaminants/pollutants in Eluru canal, as certain heavy organo-chlorines and organo-phosphates and other heavy metals like Mercury, Lead and Nickel. As the presence of heavy metals shows that either it should have been caused through food chain or through water, that is the reason why the irrigation department was directed to conduct a detailed study to identify the possible sources of contamination especially organo-chlorides and also to take up cleaning of the Eluru Canal immediately and also submit an action plan ensuring prevention of car wash and battery residues in the Eluru Canal within one month. Certain directions have been given to other departments as well, so as to restrict/prevent pollution either to the water or to the soil which has caused on account of mysterious disease found in that area.

14. It is also mentioned in the recommendation that the municipal water quality needs to be checked for more parameters like organo-chlorines and organo-phosphates on a periodical basis. Apart from that, they are also directed to monitor the level of heavy metals like Lead, Mercury and Nickel as well by conducting analysis and resort to the remedial measures to remove those metals from the water.

15. As regards the Solid Waste Management Rules, 2016 is concerned, they have not mentioned anything about the existing legacy waste and what are all the steps taken by them to dispose of the legacy waste, if any, in a scientific manner as provided under the Solid Waste Management Rules, 2016.

16. When this was pointed out, the learned counsel appearing for the State of Andhra Pradesh submitted that they will come with a detailed further report regarding the study, if any, done on the basis of the recommendations and also the remedial measures, if any, taken to mitigate the circumstances.

17. The State of Andhra Pradesh is directed to give direction to the Irrigation Department to conduct studies as directed and submit a report to this Tribunal. As regards the Kolleru Lake is concerned, the Irrigation Department, Andhra Pradesh Pollution Control Board and the Forest Department are directed to submit a detailed report regarding the steps to be

taken for improving the water quality in that lake.

18. The respective departments are directed to submit a report to this Tribunal on or before 28.07.2021 by e-filing in the form of Searchable PDF/ OCR Supportable PDF and not in the form of Image PDF along with necessary hardcopies to be produced as per Rules.

19. The Registry is directed to communicate this order to the official respondents including the Principal Chief Conservator of Forest & Head of Forest Force, State of Andhra Pradesh and Chief Secretary, Principal Secretaries for Environment and Irrigation of State of Andhra Pradesh, Andhra Pradesh Pollution Control Board by e-mail immediately for their information and submission of report as directed.

20. For consideration of further reports, post on 28.07.2021.

Sd/-
.....J.M.
(Justice K. Ramakrishnan)

Sd/-
.....E.M.
(Dr. K. Satyagopal)

O.A. No. 259/2020,
O.A. No.02/2021,
07th June, 2021. Mn.

Item No. 13 & 14:

BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

Original Application No.259 of 2020 (SZ)
With
Original Application No.02 of 2021 (SZ)

(Through Video Conference)

IN THE MATTER OF

Tribunal on its own motion
Suo Motu based on the news item in
The Indian Express, Newspaper dt. 09.12.2020,
"Andhra town Eluru hit by 'mystery' illness,
Traces of lead, nickel in blood samples",
News item in The Time of India, Newspaper
Dt. 08.12.2020, "Heavy metal content in water
Caused mysterious disease in Andhra Pradesh" &
News item in NDTV, dt. 09.12.2020,
"Lead, Nickel found in blood of people with
Mystery illness in Andhra"

...Applicant(s)

Versus

The Chief Secretary of Govt. of Andhra Pradesh

And Ors.

…Respondent(s)

With

Tribunal on its own motion
Suo Motu based on the news item in
The Hindu, edition dated 15.12.2020,
"Kolleru (West Godavari Dt.) "Mystery illness raises
Concerns over Kolleru Pollution"

...Applicant(s)

Versus

The Chief Secretary to Govt. of Andhra Pradesh,

Andhra Pradesh and Ors.

…Respondent(s)

Date of hearing: 03.01.2022.

CORAM:

HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER

HON'BLE Dr. SATYAGOPAL KORLAPATI, EXPERT MEMBER

O.A. No.259/2020:

For Applicant(s): Suo Motu by Court.

For Respondent(s): Mrs. Madhuri Donti Reddy for R1 to R7.

O.A. No.02/2021:

For Applicant(s): Suo Motu by Court.

For Respondent(s): Mrs. Madhuri Donti Reddy for R1 to R8.

ORDER

1. As per order dated 26.10.2021, this Tribunal had considered the request made by the Andhra Pradesh Pollution Control Board, District Collector and other departments and also considered the latest newspaper report

published in Eenadu Daily dated 25.10.2021 regarding large scale encroachment into the Kolleru Lake and directed the authorities to file an independent report regarding the same. This Tribunal had also directed the Forest Department to file an independent report regarding these aspects and posted the case to 23.12.2021 for that purpose. On 23.12.2021, the case was adjourned to today by notification.

2. We have received the letter dated 21.12.2021 sent by the District Collector, West Godavari, Eluru addressed to the Registrar, National Green Tribunal, Southern Zone, Chennai supposed to be the report which was sought for from him. This Tribunal, in several occasions directed the parties to file a proper report, instead of sending in the letter form through their counsel. When this was pointed out, the learned counsel appearing for the State of Andhra Pradesh submitted that they will rectify the same and file a proper report regarding the same.

3. We have also received the report submitted by the Principal Chief Conservator of Forests and Head of Forest Force signed on 14.12.2021, e-filed on 02.01.2022 which reads as follows:-

REPORT FILED BY THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS AND HEAD OF FOREST FORCE, ANDHRA PRADESH BEFORE THE NATIONAL GREEN TRIBUNAL, SOUTHERN ZONE, CHENNAI IN O.A. NO.259(SZ) OF 2020& 02/2021 (SZ)

1. SUO MOTO cases were registered by the Hon'ble National Green Tribunal (Southern Zone), Chennai, based on the Newspaper reports published in the Times of India, dated.08.12.2020; Indian Express, dated.09.12.2020 and in the Hindu, dt. 15.12.2020, under the captions "***heavy metal content in water caused mysterious disease in Andhra Pradesh***", "***Andhra town Eluru hit by 'mystery' illness, traces of Lead, Nickel in blood samples***", and "***mystery illness raises concerns over Kolleru pollution***" respectively and a news item telecasted in NDTV, dated.09.12.2020 under the caption "***Lead, Nickel found in Blood of people with a mystery illness in Andhra Pradesh***".

2. It is respectfully submitted that the Hon'ble NGT (SZ), Chennai in their order dt.26.10.2021, directed to implead the Prl. Chief Conservator of Forests & Head of Forest Force, Andhra Pradesh and also the District Forest Officer, West Godavari District as additional respondents 9 and 10 in O.A. No. 2 of 2021. Consequent to the notification of a part of Kolleru Lake as a Wildlife Sanctuary by the Government of Andhra Pradesh, the Kolleru Wildlife Sanctuary has been under the administrative control of the Andhra Pradesh Forest Department. Hence, the Prl. Chief Conservator of Forests & Head of Forest Force, Andhra Pradesh is impleaded as 9th respondent.

3. It is respectfully submitted that, Kolleru Lake is one of the largest freshwater ecosystems (Wetland) in India of International importance recognized under the Ramsar Convention (Iran 1971) in the year 2002. Out of the total area of the lake which is up to +10 feet MSL contour (Ac. 2,25,250), only up to +5 feet MSL contour (Ac.77,138) has been declared as Wildlife Sanctuary in the year 1999. Further, as per the direction of the Hon'ble Supreme Court of India in I.A. no. WP(C) no.202 of 1995, a total of 1776 no. of tanks (1140 in West Godavari district + 636 in Krishna district) covering an area of about 43,724 acres (28,949 acres in West Godavari + 15,775 acres in Krishna) have been demolished under "Operation Kolleru" within the notified area of Kolleru Wildlife Sanctuary, up to +5' contour. After operation Kolleru, the sanctuary lands were consolidated by the Revenue Department of West Godavari and Krishna Districts and handed over to the Forest Department.

4. There are mainly three categories of lands that exist inside the Sanctuary area *viz.*, Government, D-Patta, and Ziroyati lands. The area of the Ziroyati land i.e., Ac.14,861.33 is with individual farmers. The D-Pattas granted inside the Sanctuary area were cancelled at the time of notification. Traditionally, the villagers were practicing either agriculture or aquaculture activities in the area. After the "Operation Kolleru 2006", the Revenue Department from both the Districts i.e. West Godavari and Krishna has consolidated the area, village-wise and handed it over to

the Forest Department. But, the survey did not take place to demarcate the physical boundary of the Sanctuary, which runs along the +5 feet MSL contour as per the notification. During "Operation Kolleru-2006", the aquaculture tank bunds inside the Wildlife Sanctuary were partially demolished and the villagers again resorted to aquaculture activities by strengthening the partially demolished bunds. The encroachments are seasonal in nature. During monsoon season, the area within the +5 feet contour of MSL is generally flooded and once the water level recedes post-monsoon, the villagers try to repair the bunds of old tanks and start aquaculture activities. The Ziroyati lands are yet to be acquired by the Government from the farmers by paying suitable compensation. Though the D-Patta lands were cancelled at the time of notification, the farmers claim that they still have rights over those lands.

5. There is a lot of pressure from local villagers to carry out aquaculture activities and several complex issues involved from paying compensation to downsizing the Sanctuary boundary. Forest Department is making concerted efforts in protecting the sanctuary area despite all hurdles. So far, 544 cases have been registered related to encroachment, mainly for aquaculture in all the categories of the lands since 2006-07 and the cases are under trial in various courts. The details of cases registered from 2006-07 to 2021-22 (up to 31-10-2021) are given below;

ABSTRACT OF ENCROACHMENT CASES REGISTERED FROM 2006-07 TO 2021-22 (up to 31-10-2021) IN KOLLERU WLS

Year of Encroachment Case booked	No. of cases booked	The extent of Encroachment (Acres)		
		Govt.	Ziroyati	Total
2006-07	3	0	3.03	3.03
2007-08	1	0	0	0
2008-09	11	170.00	258.71	428.71
2009-10	23	307.95	471.31	779.26
2010-11	36	321.61	355.24	676.85
2011-12	11	182.21	40.88	223.09
2012-13	18	237.83	122.45	360.28
2013-14	5	28.62	22.53	51.15
2014-15	19	586.80	193.88	780.68
2015-16	33	361.37	33.48	394.85
2016-17	74	737.83	172.51	910.34
2017-18	95	2329.59	244.69	2574.28
2018-19	55	2428.97	25.71	2454.68
2019-20	46	1665.47	95.27	1760.74
2020-21	65	1305.45	1009.33	2314.78
2021-22	59	1204.12	825.24	2029.36
TOTAL::	**554**	**11867.82**	**3874.26**	**15742.08**

6. However, in some areas cases were registered multiple times since aquaculture activities were attempted in the same location every year. Accordingly, the area has been reconciled and arrived to an extent of 9522.10 Acres. (Govt. land: 6680.73 Acres. Zeroyati land: 2841.37 Acres.). District -wise particulars are given below and a map is enclosed depicting the encroachments based on the cases registered so far.

ABSTRACT OF AREA UNDER ENCROACHMENT BASED ON CASES REGISTERED FROM 2006-07 TO 2020-21 IN KOLLERU WLS

Sl. no.	District	Mandal	Area of the Mandal (Acres)	Extent of Encroachment (Acres)		
				Govt. Land	Zeroyati Land	Total
1	West Godavari	Eluru	23900	2052.24	303.51	**2355.75**
2		Denduluru	586	0	158.54	**158.54**
3		Pedapadu	789	0	179.20	**179.20**
4		Nidamarru	6838	0	495.08	**495.08**
5		Unguturu	134	0	30.81	**30.81**
6		Bhimadole	20323	1617.69	834.28	**2451.97**
7		Akiveedu	6914	580.150	517.37	**1097.520**
		Total	**59484**	**4250.08**	**2518.79**	**6768.87**
1	Krishna	Kaikaluru	10295	2539.63	308.66	**2848.29**
2		Mandavalli	7359	71.02	13.92	**84.94**
		Total	**17654**	**2430.65**	**322.58**	**2753.23**
	WLS TOTAL		**77138**	**6680.73**	**2841.37**	**9522.10**

Activities taken up by the Forest Department in the Sanctuary area:

7. The Sanctuary area is generally managed based on the prescriptions provided in the approved Management Plan. The previous Integrated Management Plan for Kolleru Wildlife Sanctuary was prepared by WISA (Wetlands International-South Asia):2008 for a period of 5 years under an assignment from the Forest Department, Government of Andhra Pradesh. The present Management Plan for Kolleru WLS is being prepared by involving Bombay Natural History Society (BNHS), Mumbai and it is under progress.

8. Forest Department is implementing various activities through State and Central schemes. The main activities implemented broadly in the Sanctuary area are Protection, Wildlife Habitat Improvement, Ecotourism, Development of bird congregation sites and infrastructure development etc., Overall, an amount of Rs.30 crore(approx.) has been spent in the sanctuary area from 2006-07 to 2020-21. Some of the important State and Central schemes being implemented currently in the sanctuary are CAMPA, BIOSAP, 04-Sanctuaries, 06-Development of National Parks & Sanctuaries, Centrally Sponsored Schemes - Conservation of Natural Resources & Aquatic Ecosystems etc., A brief note in this regard is annexed hereto.

9. The important activities being taken by Forest Department in the Sanctuary area are;

1. Protection: Establishment of base camps, strike force, check posts for regular patrolling, collecting intelligence, preventing encroachment activities, checking vehicle movement that carries fertilizers, chemicals, and fish feed into Sanctuary area etc. Presently 5 base camps, 1 strike force and 6 check posts are functioning from various locations in the Sanctuary area.

2. Habitat improvement: The activities like desilting of drains, demolition of old bunds, removal of water hyacinth and other weeds, formation of mounds, planting trees for bird nesting, installation of artificial perching stands, releasing fish fingerlings (food for aquatic birds) etc., are being taken up to create a favourable environment for the wildlife to survive.

3. Research & Monitoring: Regular censuses are being conducted to enumerate different bird species and their population. Research related to tagging of birds was conducted earlier by BNHS. Presently through M.S. Swaminathan Research Foundation (MSSRF), a study is being conducted on Socio-economic and livelihood assessment of communities living in and around Kolleru WLS.

4. Ecotourism: The ecotourism facility at Aatapaka and Madhavapuram in the sanctuary caters to visitors and acts as a Conservation Education Centre. Presently facilities like Environmental Education Centre, watchtower, boating are being maintained by the department. These facilities are being managed by local communities under the supervision of the Forest Department.

5. Awareness creation: Regular village level awareness programmes are being taken up and competitions for school and college students are being conducted during World Wetland Day, World Environment Day and Wildlife Week etc., mainly for gaining their support in the protection and conservation of this wetland.

10. Further, Forest Department is not only implementing various developmental activities but also constantly monitoring the sanctuary area and taking strict actions against the illegal activities despite all hurdles. The seasonal encroachments in the Sanctuary area mostly for aquaculture have been tackled by registering offence cases, demolishing the bunds, conducting village level programmes. The department is taking the best possible efforts to prevent and remove all kinds of encroachments in the sanctuary area.

11. It is respectfully submitted that, the Map of Kolleru Wildlife Sanctuary depicting encroachments along with a report in the form of Searchable PDF/OCR supportable PDF is enclosed herewith. Necessary hard copies are also enclosed herewith which are as follows;

- Note on schemes under implementation (ANNEXURE - I).
- A detailed note on Kolleru Wildlife Sanctuary is also enclosed herewith for kind perusal (ANNEXURE – II).
- Map of Kolleru Wild Life Sanctuary (ANNEXURE – III).

This is submitted for kind information.

14.12.21

Prl. Chief Conservator of Forests &
Head of Forest Force
Andhra Pradesh

ANNEXURE - I

Brief Note on schemes being implemented in Kolleru Wildlife Sanctuary

Andhra Pradesh Forest department is implementing various activities through State and Central schemes. The main activities implemented broadly in the sanctuary area are Protection, Wildlife Habitat Improvement, Ecotourism, Development of bird congregation sites and infrastructure development etc. Overall, an amount of Rs.30 crore (approx.) has been spent in the sanctuary area from 2006-07 to 2020-21.

The Scheme-wise activities being taken up by the Andhra Pradesh Forest Department in the sanctuary area are broadly as follows;

1. CAMPA:

a. Wildlife Habitat Improvement in protected areas

i. Boundary Demarcation by the erection of stone monoliths/cairns

b. Water Resource Management in Protected Areas

ii. Construction of water conservation structures

iii. Development and maintenance of Check dams

c. Forest & Wildlife Protection

iv. Construction of boundary pillars

2. BIOSAP

v. Habitat Improvement

3. 04-Sanctuaries:

d. Habitat Improvement and Protection

vi. Maintenance of existing bird roosting stands

4. Vanavihari (Eco-tourism):

vii. Maintenance of EECs

Centrally Sponsored Schemes

5. Conservation of Natural Resources & Aquatic Ecosystems

e. Sustainable resource development and livelihood improvement

viii. Release of fish seed (fingerlings) into Kolleru WLS at strategic points

14.12.21

Prl. Chief Conservator of Forests &
Head of Forest Force,
Andhra Pradesh

ANNEXURE –II

NOTE ON KOLLERU LAKE & KOLLERU WILDLIFE SANCTUARY

BACKGROUND:

1. Kolleru Lake is one of the largest freshwater ecosystems (Wetland) in India of international importance recognized under the Ramsar Convention (Iran 1971) in the year 2002. It is a naturally formed lake between the alluvial plains of river Godavari and Krishna deltas and acts as a natural flood balancing reservoir. The lake with its variety of habitats supports rich biodiversity including some endangered species and supports the livelihoods of a large population living in and around the wetland system.

History:

2. The lake has been under tremendous pressure due to unsustainable developmental activities, particularly agriculture and aquaculture, which have led to the construction of hydraulic structures, roads, bunds and other infrastructure within its basin. The area under cultivation within the lake increased since 1940 when the British government granted *pattas* (title deeds) on payment of market value for the land. In 1954, the government initiated cooperative farming in the region inducing the formation of 93 farming societies on 850 sq. km. of the lake bed. The native paddy varieties were gradually replaced with shorter, high-yielding varieties that required the application of high dosages of chemical fertilizers and pesticides. By 1969, almost the entire lake was brought under cultivation and huge bunds were constructed to keep water out to protect the crops. As floods threatened cultivated areas almost every year, several control measures were also initiated during this period. However, the entire area was ravaged by a cyclone in 1969 which led to the near-complete destruction of agriculture. By the time flood control measures were completed, most of the people had become disillusioned with agriculture and had abandoned it. The roads and bridges that came up with agricultural development coupled with the increased demand for fish created a new livelihood opportunity and vast market for fish by 1978. Land use shifted to pisciculture which suddenly became profitable and by 1984, 5000 acres of government land within the lake bed was converted to fish tanks under the management of cooperative societies. The land was arbitrarily and haphazardly notified for pisciculture in total disregard to natural drainage patterns. High-profit margins subsequently induced contractors and private entrepreneurs into the Kolleru Lake area, who intensified aquaculture without adopting any environmental safeguards.

3. Realizing the rapid degradation of Kolleru Lake, the Government of Andhra Pradesh constituted several committees to propose measures for its restoration. Most of these committees, however, suggested engineering solutions aimed at agriculture and fisheries development and flood control. The measures proposed were aimed at the diversion of water to the upstream reaches reducing flows to the lake. The report of the expert committee on floods of deltaic areas on Krishna, Godavari and Guntur Districts by the Mitra Committee in 1966 suggested the construction of reservoirs at Budameru and Tammileru for storage of floodwaters (Mitra, 1966). Widening of Upputeru was proposed to drain the floodwaters with the lake levels controlled through the construction of a regulator (Mitra, 1966; Sreeramakrishnaiah, 1987; Ramakrishnan, 1980). Pandurangam (1976) recommended the construction of 71 tanks and necessary development to promote fisheries. Construction of roads, school buildings, hospitals, electrification and development of piggery, duckery, and dairy farms for socio-economic benefit were also recommended.

Area:

4. The Kolleru lake spreads over an area of 2,25,250 acres up to +10 feet contour MSL with rich biodiversity. The water spread area of Kolleru lake is as follows:

Up to +10 feet contour MSL	2,25,250 acres
Up to +7 feet Contour MSL	1,68,750 acres
Up to +5 feet contour MSL	77,138 acres
Up to +3 feet contour MSL	33,750 acres

Declaration of Kolleru wildlife sanctuary:

5. Govt. have issued a draft preliminary notification declaring Kolleru lake as a Wildlife Sanctuary vide G.O.Ms.No.76, EFS&T (For.III) Dept, dated. 25-9-1995. Later, the Govt. have issued a final notification of the sanctuary vide G.O.Ms.No. 120, EFS&T (For.III) Dept., dated.4-10-1999. The Kolleru Wildlife Sanctuary spreads over 9 Mandals, i.e., 7 Mandals in West Godavari and 2 Mandals in Krishna District with an extent of 30,855.20 ha or 77,138 acres up to +5 feet contour MSL. Out of this, 14861.33 Acres are privately owned Patta lands.

The sanctuary area details are as follows:

Sl. no.	District	Name of the Mandal	Area in Acres
1	West Godavari	Eluru	23900
2		Unguturu	134
3		Pedapadu	789
4		Denduluru	586
5		Akiveedu	6914
6		Nidamarru	6838
7		Bhimadolu	20323
	West Godavari district total		**59484**
8	Krishna	Kaikaluru	10295
9		Mandavalli	7359
	Krishna District Total		**17654**
	Total		**77138**

Status of WPs filed in the Hon'ble High Court of Andhra Pradesh:

6. Aggrieved by the notification orders issued by Government, several hundreds of illegal fish tank owners and other groups have filed several writ-petitions in Hon'ble High Court challenging the notification issued in 1999. After hearing all the writ-petitions, the Hon'ble High Court has bunched all the writ-petitions and treated them as a single case proclaimed the judgment on 30-7-2001, declaring the final notification issued by the State Govt. vide G.O.Ms.No.120 as valid and issued the following directions to the Government of A.P.;

- The final notification issued is valid.
- The Govt. should take all the steps to bring back Kolleru to its pristine glory.
- No pisciculture/aqua-culture/shrimp culture should be permitted inside the sanctuary except traditional methods of fishing and traditional agriculture in their Patta lands, till such time their agriculture lands are acquired by Government.
- All encroachments within Kolleru sanctuary up to +5' contour should be removed.

Page 10 of 20

- Government should take adequate steps in stoppage of effluents into Kolleru lake.

Steps taken by Govt. of A.P after the Hon'ble High Court orders, dt.30.7.2001:

7. In order to implement the Hon'ble High Court orders, the Government have taken several steps. Taskforce teams were formed to prevent illegal encroachments. The Forest Department has removed 54 illegal fish tanks and faced threats and very difficult situations. Motivation camps were conducted to educate the local people on the adverse effects of floods like crop damages, deterioration of water quality, dangerous effects of pollution due to excessive usage of chemical fertilizers, feed, and pesticides by the illegal fish tank owners, etc. A total of 731 cases were booked for habitat destruction etc., from 30-7-2001 to 17.11.2005. Pollution control measures were taken by monitoring the water quality in 19 stations.

PIL filed by NGO (Nallamalai Foundation) before the CEC:

8. As the matter stands at this stage, the Executive Director, Nallamalai Foundation (NGO) filed an IA No.381/2005 before the Central Empowered Committee (CEC), constituted by the Hon'ble Supreme Court of India in W.P. (C) No.202/95 and 171/96 praying for the direction to the State Govt. on;

1. Immediate eviction of all encroachments in the sanctuary.
2. To expedite the acquisition of private Patta lands.
3. Cancellation of D-Form pattas (2,882 acres). (These D-Form pattas were cancelled by the Collector, West Godavari District on 11.8.2005 and 20.10.2005, and by the District Collector, Krishna on 10.1.2002 and 21.2.2002).
4. To bring back the Kolleru Lake to its pristine glory.

9. Hon'ble CEC has called for objections and conducted several hearings at New Delhi and also in Hyderabad wherein all the people representatives, several illegal fish tank owners, a large number of advocates have presented their cases before the committee and filed their affidavits during January-March, 2006. After the final hearing, the CEC has submitted its report to the Hon'ble Supreme Court of India during the month of March 2006.

Directions of the CEC of Hon'ble Supreme Court of India:

10. While dealing with a petition in IA No.1486-1487, Dt.20.3.2006, the Central Empowered Committee appointed by the Hon'ble Supreme Court of India, vide Para No.54 of their report; issued the following directions;

a. Use or transportation of inputs for pisciculture such as chemical fertilizer, farmyard manure, poultry manure, DOB, oil cakes etc., shall not be allowed in Kolleru Wildlife Sanctuary.
b. All fish tanks constructed inside the sanctuary shall be demolished in a time-bound manner starting from the big to the smaller ones. The tanks of an area of more than 100 acres (cumulative) shall be demolished within a period of 15 days and the remaining tanks shall be demolished by 31st May 2006.

Judgment of Hon'ble Supreme Court of India and action taken by the Govt. of A.P:

11. Aggrieved by the order of the CEC, the Kolleru Food Industries have filed a Writ Petition No.1486-1487 before the Hon'ble Supreme Court of India and the Supreme Court in their judgment Dt:10.04.2006 have upheld the directions issued by the CEC. As per the direction of the Hon'ble Supreme Court of India, under "Operation Kolleru" totally, 1776 tanks (1140 in West Godavari + 636 in Krishna district) covering an area of about 43,724 acres (28,949 acres in West Godavari + 15,775 acres in Krishna) have been demolished in Kolleru wildlife sanctuary up to +5' contour. The demolition work has been taken up and completed by 15.6.2006 as per the orders of the Hon'ble Supreme Court and CEC. The demolition was carried out by the revenue department under the supervision of District Collectors.

Post "Operation Kolleru-2006"

12. After the completion of "Operation Kolleru" in 2006, the revenue department from both the districts consolidated the lands falling up to +5 feet contour MSL and handed them over to the forest department for management. The Kolleru Wildlife Sanctuary is under the administrative control of the Wildlife Management Division, Eluru. Unlike the regular reserve forest blocks, the boundary of the sanctuary is described in terms of +5 feet MSL contour line in the notification. Through G.O no.144, EFS&T (For.II) dept., dt.15.11.2006 staff were recruited on a contract basis under various categories to effectively manage the sanctuary area.

Details of private Patta lands owned by farmers:

13. Traditional agriculture in privately owned lands is permitted as per G.O. Ms.No.120, EFS & T (For.III) Dept., dt.4.10.1999. The Patta lands owned by private owners having legal rights to practice traditional agriculture within the sanctuary area up to +5' contour is 14,861.33 acres out of the total sanctuary area of 77,138 acres. The details are given below:

Sl. no.	Name of the Mandal	No. of villages	No. of Ryots	The Extent of area (Acres)
	West Godavari Dist.			
1.	Eluru	7	399	823.61
2.	Pedapadu	3	199	496.52
3.	Denduluru	2	111	380.28
4.	Bhimadolu	5	1167	2426.87
5.	Nidamarru	11	4126	6150.63
6.	Unguturu	1	30	146.46
7.	Akiveedu	10	1981	3475.1
	Total	**39**	**8013**	**13899.47**
	Krishna District			
1.	***Kaikaluru***	10	125	571.45
2.	***Mandavalli***	5	71	390.41
	Total	**15**	**196**	**961.86**
	Grand total	**54**	**8209**	**14861.33**

14. As per G.O.Ms.No.120, dated.4.10.1999 and the judgment of the Hon'ble High Court, dated.30.7.2001 and also as per the Hon'ble Supreme Court of India's orders in April 2006, the owners of the agriculture lands can practice traditional agriculture without using pesticides and chemicals. But the farmers are agitating to permit them to use chemical fertilizers to get more yields, which is illegal. Otherwise, they are requesting to pay adequate compensation to their lands.

15. The Dist. Collector, West Godavari indicated Rupees Six Hundred Twenty-Five Crore Forty-Eight lakh (Rs.625.48 crore) and the Dist. Collector, Krishna has indicated Rupees Thirty crore (Rs.30.00 crore) to acquire an extent of 13,899.47 acres and 961.86 acres respectively. Accordingly, the Govt. have proposed to pay the total compensation of rupees Six hundred fifty five crore and forty eight lakh (Rs.655.48 crore) for paying compensation to the agriculture landowners to an extent of 14,861.33 acres from accumulated Compensatory Afforestation Management & Planning Agency (CAMPA) and requested Hon'ble Minister for Environment, Forests & Climate Change to consider this proposal. But the Union Minister, MoEF & CC, GoI in National Board for Wildlife Meeting held by him on 22-12-2009 has decided and informed that CAMPA funds cannot be used for acquisition of private lands and the question of payment of compensation to the farmers from CAMPA funds cannot be considered.

A.P. State Legislative Assembly resolution on 04.09.2008:

16. The A.P Legislative Assembly on 4-9-2008 had adopted a resolution to request the National Board of Wildlife, GoI and the Central Empowered Committee for reduction of the boundary of Kolleru Wildlife Sanctuary from +5 feet contour to +3 feet contour to mitigate the problems of the farmers.

17. The Ministry of Environment, Forests & Climate Change, GoI has been addressed accordingly vide EFS&T Lr.No.5876/For.II (2) 2006, dated. 17.10.2008 to place the matter before the National Board for Wildlife. The issue was discussed in the 17th meeting of the Standing Committee of the National Board for Wildlife on 22.12.2009 and the Chairman decided to visit the site. Hon'ble Union Minister for Environment, Forests & CC visited the Kolleru WLS along with the public representatives on 27.2.2010 and announced that a committee will be formed to look into the problems of the people and environmental issues. The Government of India have constituted a 7-member committee vide GoI F.No.6-118/2008/WL-1, Dt: 29.4.2010 headed by Dr. P. A. Azeez, SACON. The Committee has visited the Kolleru lake from 20th to 25th September 2010 and the report was submitted to the Government of India in April 2011.

18. The committee was not in agreement with the proposed reduction of the area from +5 feet contour to +3 feet contour as this would seriously affect the conservation of wildlife especially the migratory birds. The committee felt that it is not advisable to reduce the sanctuary area as it would not be a viable solution for socio-economic and ecological issues confronting the stakeholders and local communities dependent on the lake. The committee has stressed the need for appropriate relocation and rehabilitation policy to be adopted in acquiring the private lands below the +5 feet MSL contour level. The GoI has accepted the committee report and directed the State Government to implement the recommendations of the Committee vide F.No.6-118/2008/WL-I, Dt: 6.6.2012.

19. While is so, the Government of India have formulated the Wetlands (Conservation & Management) Rules, 2010 under the Environment (Protection) Act, 1986 (the same are amended subsequently in 2017). According to these rules, the entire Kolleru Lake up to +10 feet contour MSL (901 sq.km) will be under the purview of the Wetlands (Conservation & Management) Rules, 2010. Consequent to this and because of severe public opposition, the Government of Andhra Pradesh in letter No.10295/For-II (2)/2010-2, dt: 29.01.2011, has requested the Government of India to drop the proposals of bringing the entire lake under the purview of Wetlands (Conservation & Management) Rules, 2010 and also requested that these rules may be applied to the areas in Kolleru lake which remain underwater for most of the period of the year (up to +3 contour level).

A.P State Legislative Assembly Resolution on 23.12.2014:

20. The Andhra Pradesh Legislative Assembly have adopted the following resolution on 23.12.2014. "Kolleru Lake has been declared as Wildlife Sanctuary up to +5 feet Contour vide G.O. Ms.No.120, EFST&T (For.III) Dept., dated 04.10.1999 over an area of 30,855.20 Hectares, which includes 14,861.33 acres of Ziroyathi lands of which 13,899.47 acres is in West Godavari District 961.86 acres in Krishna District.

21. That these farmers are not getting adequate income from traditional agriculture without utilizing chemical fertilizers as per GO.Ms.No.120 EFS&T (For-III) Dept., dt.04.10.1999. The compensation proposed to be paid for acquiring these lands will cause a heavy financial burden on the state exchequer.

22. This House resolved to request the National Board for Wildlife, Government of India and the "Central Empowered Committee" to recommend for reduction of the boundary of Kolleru Wildlife Sanctuary from +5 feet Contour to +3 feet Contour to mitigate the problems of the farmers.

23. The above-said resolution was placed before State Board for Wildlife Andhra Pradesh. The State Board for Wildlife in its meeting held on 13.08.2015 recommended the reduction of the boundary of Kolleru Wildlife Sanctuary from +5 feet Contour to +3 feet Contour to the National Board for Wildlife.

24. The Standing Committee of the National Board for Wildlife in its 35th meeting held on 18th Aug 2015 discussed the proposal for boundary alteration of Kolleru Wildlife Sanctuary. The Standing Committee decided to constitute a Working Group to study all aspects of the matter. The Working Group will include member Prof R.Sukumar, representative of Wildlife Institute of India, a nominee of Wildlife Division of the Ministry and a representative of the State Forest Department of Andhra Pradesh. The Group visited the Kolleru Wildlife Sanctuary area during the second week of December 2015 and brainstormed on all aspects of the proposal and to suggest viable options, including rationalization of boundaries of the Sanctuary, for conservation of the wetland and the Sanctuary while ensuring that no hardships are caused to the bonafide owners of the lands in the area.

25. Further, in the Standing Committee of National Board for Wildlife in its 37th Meeting held on 26-02-2016, Chairman requested Dr. Sukumar and the site inspection team to interact with the state Government of Andhra Pradesh and finalize the report with the recommendations for the part of the Sanctuary area, which is suitable for de-notification, which would cater to the needs of the local and owners while preserving the Kolleru Bird Sanctuary.

26. Further, in the 40th Meeting of Standing Committee of National Board for Wildlife held on 3rd January 2017, member Dr.Sukumar, described the recommendations made in the report,

- No compromise with the ecological balance by a drastic reduction in sanctuary area as per Andhra Pradesh State Assembly Resolution.
- Deletion of private Ziroyati lands from the sanctuary, i.e., approx. 5533.3 ha located inside the north-eastern boundary of Kolleru WLS except major rivers/streams flowing within this area retaining 10 m on either side of the stream/river by the government to ensure the environmental water flow into sanctuary.
- Based on the authentic information on the extent of lands assigned to Scheduled Castes and Backward Class communities, the genuine D-Patta

cooperative societies be accommodated adjoining the Ziroyati lands to be deleted. Their process of rehabilitation should be ensured that these lands do not fall into the hands of 'Benami' owners.

- The government should be prepared to invest resources in R&R to resolve the rehabilitation cost of remaining Ziroyati landowners.
- The above actions may be started after the compilation of reliable data on the actual boundary of Kolleru WLS and the preparation of an integrated management plan.
- Within the rationalized boundaries of sanctuary, the important areas of bird congregation should be declared as core zones free of human disturbances and the rest buffer areas can be used for traditional fishing without the construction of bunds.
- Ecologically Sensitive Zone (ESZ) should be declared up to the present boundary or may be extended to a distance recommended by experts on wetland ecology.

27. Further, the Standing Committee of the National Board for Wildlife in its 48th meeting held on 27.03.2018 recommended for deletion of Ac.19797.69 cents (Approx. Ac.20000 cents) of private Ziroyati lands and D-Patta lands as per the resolution passed by the Government of Andhra Pradesh. Hon'ble CEC addressed the Chief Secretary, A.P vide letter dated 25.07.2018 (F.No.2-77/CEC/SC/2018-Pt.VI) advised no further action may be taken to implement the decision of the Standing Committee of National Board for Wildlife taken at its meeting held on 27.03.2018.

Encroachment status within Kolleru WL Sanctuary (up to +5 feet contour):

28. There are mainly three categories of the lands that exist inside the sanctuary area (Government, D-Patta & Ziroyati). Traditionally the villagers are practicing either agriculture or aquaculture activities in the area. The D-Patta lands were cancelled at the time of notification. After the "Operation Kolleru-2006", the revenue department from both the districts consolidated the area village-wise and handed it over to the forest department. The survey did not take place to demarcate the sanctuary boundary and as per the notification, the boundary of the sanctuary runs along the +5 feet of contour MSL. During "Operation Kolleru-2006" the aquaculture tank bunds inside the Wildlife Sanctuary were only partially demolished and the villagers again resorted to aquaculture activities by strengthening the partially demolished bunds. The encroachments are seasonal in nature, during monsoon season the area within +5 feet of contour MSL generally flooded and once the water level recedes post-monsoon, the villagers will try to repair the bunds of old tanks and start aquaculture activities. The Ziroyati lands are yet to be acquired by Government from the farmers by paying compensation. Though the D-Patta lands were cancelled at the time of notification, the farmers feel that still they have rights over those lands.

29. There is a lot of pressure from local villagers to carry out aquaculture activities and several complex issues involved from paying compensation to downsizing the sanctuary boundary. The Forest Department is taking concerted efforts in protecting the sanctuary area despite all hurdles. So far 544 cases have been registered related to encroachment in all the categories of the land since 2006-07 and the cases are under trial in various courts. The details of cases booked from 2006-07 to 2021-22 (up to 31-10-2021) are given below.

ABSTRACT OF ENCROACHMENT CASES REGISTERED FROM 2006-07 TO 2021-22 (up to 31-10-2021) IN KOLLERU WLS

Year of Encroachment Case booked	No. Cases booked	The Extent of Encroachment (Acres)		
		Govt.	Ziroyati	Total
2006-07	3	0	3.03	3.03
2007-08	1	0	0	0
2008-09	11	170.00	258.71	428.71
2009-10	23	307.95	471.31	779.26
2010-11	36	321.61	355.24	676.85
2011-12	11	182.21	40.88	223.09
2012-13	18	237.83	122.45	360.28
2013-14	5	28.62	22.53	51.15
2014-15	19	586.80	193.88	780.68
2015-16	33	361.37	33.48	394.85
2016-17	74	737.83	172.51	910.34
2017-18	95	2329.59	244.69	2574.28
2018-19	55	2428.97	25.71	2454.68
2019-20	46	1665.47	95.27	1760.74
2020-21	65	1305.45	1009.33	2314.78
2021-22	59	1204.12	825.24	2029.36
TOTAL:	**554**	**11867.82**	**3874.26**	**15742.08**

30. However, in some areas cases were registered multiple times since aquaculture activities were attempted in the same location every year. Accordingly, the area has been reconciled and arrived to an extent of 9522.10 Acres. (Govt land: 6680.73 Acres. Ziroyati land: 2841.37 Acres.). District-wise particulars are given below and the map is enclosed depicting the encroachment based on the cases registered so far.

ABSTRACT OF AREA UNDER ENCROACHMENT BASED ON CASES REGISTERED FROM 2006-07 TO 2020-21 IN KOLLERU WLS

Sl. no.	District	Mandal	Area of the Mandal (Acres)	Extent of Encroachment (Acres)		
				Govt. Land	Ziroyati Land	Total
1	West Godavari	Eluru	23900	2052.24	303.51	**2355.75**
2		Denduluru	586	0	158.54	**158.54**
3		Pedapadu	789	0	179.20	**179.20**
4		Nidamarru	6838	0	495.08	**495.08**
5		Unguturu	134	0	30.81	**30.81**
6		Bhimadole	20323	1617.69	834.28	**2451.97**
7		Akiveedu	6914	580.150	517.37	**1097.520**
		Total	**59484**	**4250.08**	**2518.79**	**6768.87**

1	Krishna	Kaikaluru	10295	2539.63	308.66	**2848.29**
2		Mandavalli	7359	71.02	13.92	**84.94**
		Total	**17654**	**2430.65**	**322.58**	**2753.23**
	WLS TOTAL		**77138**	**6680.73**	**2841.37**	**9522.10**

Activities have been taken up by the Forest department in the sanctuary area:

31. Forest Department is implementing various activities through state and central schemes. The main activities implemented broadly in the sanctuary area are Protection, wildlife habitat improvement, ecotourism, development of bird congregation site, infrastructure development, etc. Overall, an amount of Rs.30 crore (approx.) has been spent in the sanctuary area from 2006-07 to 2020-21. Some of the important state and central schemes being implemented currently in the sanctuary are CAMPA, BIOSAP, 04-Sanctuaries, 06-Development of National Park & Sanctuaries, Centrally Sponsored Schemes - Conservation of Natural Resources & Aquatic Ecosystem etc.,

32. The important activities being taken by Forest Department in the sanctuary area are;

1. **Protection:** Establishment of base camps, strike force, check posts for regular patrolling, collecting intelligence, preventing encroachment activities, checking vehicle movement that carries fertilizers, chemicals, and fish feed into sanctuary area etc. Presently 5 base camps,1 strike force, and 6 check posts are functioning from various locations in the sanctuary area.
2. **Habitat improvement:** The activities like desilting drains, demolition of old bunds, removal of water hyacinth and other weeds, formation of mounds, planting of trees for bird nesting, installation of artificial perching stands, releasing fish fingerlings (food for aquatic birds) etc., are being taken up to create a favourable environment for the wildlife to survive.
3. **Research & Monitoring:** Regular census is being conducted to enumerate different bird species and their population. Research related to tagging of birds was conducted earlier by BNHS. Presently through MS Swaminathan Research Foundation (MSSRF), a study is being conducted on Socio-economic and livelihood assessment of communities living in and around Kolleru WLS.
4. **Ecotourism:** The ecotourism facility at Aatapaka and Madhavapuram in the sanctuary caters to the visitors and acts as a Conservation Education Centre. Presently facilities like Environmental Education Centre, watch tower, boating are being maintained by the department. These facilities are being managed by local communities under the supervision of the forest department.
5. **Awareness creation:** Regular village level awareness programmes are being taken up and competitions for school and college students are being conducted during world wetland day, world environment day, wildlife week etc., mainly for gaining their support in the protection and conservation of this wetland.

33. Forest Department is not only implementing various developmental activities but also constantly monitoring the sanctuary area and taking strict actions against the illegal activities. The department is taking the best possible efforts to prevent and remove all kinds of encroachments in the sanctuary area. The sanctuary area is generally managed based on the prescriptions provided in the approved Management Plan. The previous Integrated Management Plan for Kolleru Wildlife Sanctuary was prepared by WISA (Wetlands International-South Asia):2008 for a period of 5 years under an assignment from the Forest Department, Government of

Andhra Pradesh. The present management plan for Kolleru WLS is being prepared by involving Bombay Natural History Society (BNHS), Mumbai and it is under progress.

Conclusion:

34. It is submitted that Kolleru lake is an important wetland in Andhra Pradesh. Out of the total area of the lake which is up to +10 feet MSL contour (Ac. 225250) only up to +5 feet MSL contour (Ac.77138) has been declared as a wildlife sanctuary in the year 1999. After "Operation Kolleru -2006", the sanctuary lands were consolidated by the revenue department of both the districts and handed it over to the Forest Department. Since then, the forest department is managing the sanctuary effectively despite all hurdles. The seasonal encroachments in the area mostly for aquaculture have been tackled by registering offense cases, demolishing the bunds, conducting village level awareness programmes etc.

35. Further, only 34.24% of the lake has been declared as Kolleru WLS out of the total lake area of Ac.2,25,250. The water quality in the lake not only depends on the activities carried out inside the sanctuary area (up to +5 feet MSL contour) but also based on the activities happening in the lake basin area. **Hence, to understand the dynamics of this wetland ecosystem and various factors responsible for the degradation of water quality of the lake, a comprehensive scientific study is essential, which needs to be conducted through subject experts in the field of wetland/lake management by involving all the stakeholders working in Kolleru lake basin to manage the Kolleru lake/wetland holistically.**

4. It is seen from the report that there are certain deficiencies noted stating that complete survey as required has not been conducted. It is also mentioned in the report that out of 2,25,50 Acres of total lake area, only 34.24% of lake has been declared as Kolleru Wildlife Sanctuary. It is also mentioned that to understand the dynamics of this wetland ecosystem and various factors responsible for the degradation of water quality of the lake, a comprehensive scientific study is essential, which needs to be conducted through subject experts in the field of wetland/lake management by

involving all the stakeholders working in Kolleru Lake Basin to manage the Kolleru Lake/wetland holistically.

5. It is also seen from the report that due to usage of organophosphate chemical pesticides, some amount of organic chemicals were also found in the lake and the drinking water. The Agriculture Department is also expected to file a detailed report as to how this will have to be rectified by them by educating farmers and also restricting the use of such chemicals in agricultural activities in the area. They are also directed to file an independent report in this aspect before this Tribunal.

6. The State of Andhra Pradesh is directed to conduct a comprehensive scientific study as suggested by the Principal Chief Conservator of Forest as well in order to protect the water body and remove the encroachments and hand over the entire area to the Forest Department, so as to maintain the lake area in the wildlife sanctuary in an effective manner and also pollution free.

7. The learned counsel appearing for the District Collector – Krishna District as well as the Andhra Pradesh Pollution Control Board wanted some time to file their independent reports regarding these aspects.

8. They are directed to submit the respective reports to this Tribunal on or before 10.02.2022 by e-filing in the form of Searchable PDF/OCR Supportable PDF and not in the form of Image PDF along with necessary hardcopies to be produced as per Rules.

9. The Registry is directed to communicate this order to the official respondents including the Principal Secretary for Agriculture, State of Andhra Pradesh and also the Chief Secretary, State of Andhra Pradesh by e-mail for their information and compliance of the direction in respect of the study to be conducted as suggested by the Principal Chief Conservator of Forest to save the wildlife sanctuary as well as the lake against pollution, in view of the international importance of Kolleru Lake which was already declared as a wetland under the Ramsar Convention.

10. For consideration of further reports, post on 10.02.2022.

Sd/-
.....J.M.
(Justice K. Ramakrishnan)

Sd/-
.....E.M.
(Dr. Satyagopal Korlapati)

O.A. No.259/2020 (SZ) &
O.A. No.02/2021 (SZ)
03rd January, 2022. Mn.

Registered No. HSE/49. [Price : 0-40 Paise.

ఆంధ్ర ప్రదేశ్ రాజ పత్రము

THE ANDHRA PRADESH GAZETTE

PART I-EXTRAORDINARY

PUBLISHED BY AUTHORITY

No. 407] HYDERABAD, TUESDAY, OCTOBER 5, 1999

NOTIFICATIONS BY GOVERNMENT

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ENVIRONMENT, FORESTS, SCIENCE AND TECHNOLOGY DEPARTMENT

(For.-III)

DECLARATION OF AREAS FOR KOLLERU WILDLIFE SANCTUARY

[G.O.Ms.No. 120, Environment, Forest, Science and Technology (For.-III), 4th October, 1999.]

In exercise of the powers conferred by Section 26-A of the Wildlife (Protection) Act, 1972 (Central Act No. 53 of 1972), the Governor of Andhra Pradesh hereby declares the areas specified in the schedule below delineated and marked in the map kept in the office of the Prl. Chief Conservator of Forests, Andhra Pradesh, Hyderabad to be a Wildlife Sanctuary, for the protection of birds and other wildlife in the area, which shall be called "KOLLERU WILDLIFE SANCTUARY".

2. This Notification shall come into force with effect from the date of Publication of this Notification in the Andhra Pradesh Gazette.

G. 548. [1]

THE SCHEDULE

(1) Name of the Districts : West Godavari and Krishna

(2) Name of the Mandals :

A) West Godavari District

i) Eluru
ii) Unguturu
iii) Pedapadu
iv) Denduluru
v) Akiveedu
vi) Nidamarru
vii) Bhimadole

B) Krishna District

i) Kaikaluru
ii) Mandavalli

(3) Name of the Forest Divisions : 1. Eluru, 2. Krishna

(4) Name of the Forest Ranges : 1. Eluru, 2. Vijayawada

(5) Name of the Wildlife Division : Wildlife Management Division, Eluru

(6) Name of the Sanctuary : Kolleru Wildlife Sanctuary

(7) Area of the Sanctuary : 308.55 Sq. Kms or 30,855.20 Ha.

Sno.	Mandal	District	Area in Ha.
1	Eluru	West Godavari	9560.00
2	Unguturu	--do--	53.71
3	Pedapadu	--do--	315.72
4	Denduluru	--do--	234.23
5	Akiveedu	--do--	2765.62
6	Nidamarru	--do--	2735.30
7	Bhimadolu	--do--	8129.00
8	Kaikaluru	Krishna	4117.81
9	Mandavalli	--do--	2943.81
	Total		30855.20

BOUNDARY DESCRIPTION: The Boundary runs along the contour at +5' MSL as marked in the map kept in the O/o. Principal Chief Conservator of Forests, Andhra Pradesh, Hyderabad. The village wise details of area included in the Sanctuary including details of Survey Numbers is kept in the O/o. the Principal Chief Conservator of Forests, Andhra Pradesh, Hyderabad.

) EAST 'A' TO 'B': The Sanctuary starts at Station 'A' which is a trijunction of R.S.Nos.1050, 1061 and 1069 of Vaddegudem village H/o. Kaikaram Revenue village of Unguturu Mandal (West Godavari District) as shown on the map at +5' Contour. Then the line traverses generally in Southernly direction along +5' Contour till it reaches point 'B', a point on common village boundary in R.S.Nos. 207 of Mandavalli and 134 of Akiveedu village 500mts north of Kaikaluru- Bhimavaram Railway line as shown in the map. While the line traverses along the +5' contour of the lake it touches the villages Voddegudem H/o. Kaikaram, Tokalapalli, Binepally, D. Gopavaram, Pedanindrakolanu, Nidamarru, Venkatapuram, Timmaraogudem, Adavikolanu, Chanamilli, Bavayyapalem, Krovvidi (Nidamarru Mandal), Pedakapavaram, Chinakapavaram, Gummuluru, Kollaparru, Siddapuram (Akiveedu Mandal), Kottada (Kaikaluru Mandal) Dharamapuram, Akiveedu and Madivada (Akiveedu Mandal). This line cuts across Tokalapalli drain, Siddapuram drain and Chinakapavaram drain.

) SOUTH 'B' TO 'C': Thence the line from point 'B' traverses generally in Westerly direction along the Southern boundary of the lake along +5' Contour till point 'C' which is south western corner of R.S.No.241 and South East corner of Rs.Nos 152 of Ingilipakalanka village of Mandavalli Mandal in Krishna District located at South West corner of the lake, as shown in the map. The line runs parallel to the road from Akiveedu to Kaikaluru touching the villages of Akiveedu ,Dumpagadapa (Akiveedu Mandal), Someswaram, Alapadu, Pallewada, Penchikalamarru (Intrusion as English alphabet Z shape) then to Pallewada, Bhujabalapatnam, Gonepadu, Atapaka, Kaikaluru (Kaikaluru Mandal), Dayyampadu, Chintapadu, Kovvadalanka, Chintapadu, Pulaparru, Pillipadu, Nutchimilli, Takkellapadu, Ingilipakalanka (Mandavalli Mandal). This line cuts across Upputeru river, Polaraju drain, Eluru-Kaikaluru road and Moturu Channel.

) WEST 'C' TO 'D': Thence the line from point 'C' traverses generally in North, Northerly and South Westerly directions along +5' Contour of the lake and reaches the point 'D', trijunction of R.S.Nos. 391, 392 and 402 of Satyavolu village of Pedapadu Mandal in West Godavari District where Ramuleru River crosses +5' contour of the lake which is the Eastern limit of Satyavolu village. While the line traverses from point 'C' to 'D', it touches the villages of Ingilipakalanka, Nandigamalanka, Penumakalanka, Manuguturu, Penumakalanka, Nandigamalanka (Mandavalli Mandal), Koniki, Satyavolu (Pedapadu Mandal). This line crosses Gudivada channel, Chandraiah drain, N.S. drain of Nellimali, Dosapadu channel, Budameru river right and left branches.

) NORTH 'D' TO 'A': Then the boundary line runs generally in North-easterly direction upto Sriparru village thence in Southernly direction through Manuru Village limits till it crosses Eluru to Kaikaluru road thence it travels in Northernly direction upto a point where it crosses Thammileru western branch. Thence it runs in North-easterly direction till it touches Gundugolanu-Agadalalanka road and then it runs generally in Southernly direction upto Komatilanka village. Thence it runs in Northernly

direction upto a point where it crosses Escape drain at the junction point of Bhimadolu and Ambarpeta villages. Thence it runs in Easterly direction to reach the starting point at 'A'. The Northern boundary line passes through the villages Satyavolu, Mupparru (Pedapadu Mandal), Manuru, Sriparru, Ponnangi, Kalakuru, Jalipudi, Chitaparru (Eluru Mandal), Kovvali, Dosapadu, Pothanuru (Dendulury Mandal), Agadalalanka, Chettunnapadu, Mallavaram (Bhimadolu Mandal), Kokkirayi lanka, Gudivaka lanka, Komatilanka, Prattikollalanka, Paidichintapadu (Eluru Mandal) and again Mallavaram, Chettunnapadu, Agadallanka, Amberpeta and Poolla (Bhimadolu Mandal), Kaikaram village (Unguturu Mandal). This line crosses the Pedapadu drain, Vatluru drain, Tammileru western branch, Jalipudi drain, Tammileru eastern branch, Kovvali drain, Agadalalanka channel and No.3 Escape drain.

NAMES OF THE VILLAGES:

Krishna District

Kaikaluru Mandal :

1) Chinnakottada	2) Penchikalamarru	3) Vadlakutithippa	4) Kolletikota
5) Laxmipuram	6) Gummallapadu	7) Gokarnapuram	8) Srungavarappadu
9) Pandiripallegudem	10) Jangampadu	11) Kovvadada	12) Pallevada
13) Someswaram,	14) Bhujabalapatnam	15) Chatrai	16) Singapuram
17) Atapaka	18) Gonepadu	19) Kaikaluru	20) Pedakottada
21) Pandiripalli gudem			

Mandavalli Mandal:

1) Penumakalanka	2) Marugunuru	3) Kovvadalanka	4) Chintapadu
5) Devvampadu	6) Nutchumilli	7) Nandigamalanka	8) Pagidipakalanka

West Godavari District

Eluru Mandal:

1) Paidichintapadu	2) Manuru	3) Kalakuru	4) Gudivakalanka
5) Komatilanka	6) Kokkirailanka	7) Prattikollalanka	8) Chataparru
9) Jalipudi	10) Sriparru	11) Ponangi	

Nidamarru Mandal:

1) Nidamarru	2) Adivikolanu	3) Venkatapuram	4) Tokalapalli
5) Pedanindrakolanu	6) Chanamilli	7) Bavaipalem	8) Binepalli
9) Krovvidi	10) D.Gopavaram	11) Timmaragudem	

Akiveedu Mandal:

1) Akiveedu	2) Madivada	3) Dharmapuram	4) Dumpagadapa
5) Siddapuram	6) Kolleru	7) Gummuluru	8) Chinakapavaram
9) Pedakapavaram	10) Kollapuru		

Denduluru Mandal:

1) Pothunuru 2) Kovvali 3) Dosapadu

Pedapadu Mandal:

1) Mupparru 2) Satyavolu 3) Koniki

Bhimadole Mandal:

1) Bhimadole 2) Amberpeta 3) Puila 4) Mallavaram

5) Chettunnapadu 6) Agadalalanka

Unguturu Mandal:

1) Kaikaram

The existence, nature and extent of rights as determined by the District Collector, Krishna vide Proceedings No.E6/1236/97, Dated: 01-09-1998 and by the District Collector, West Godavari, Eluru in Rc.No.D6/11717/96, Dated:08-08-1999 are as follows:

1. Right to do fishing with traditional methods using mavus, nets of size (which does not cause damage to seed but catches only fish of harvestable size) which will be specified separately by the Chief Wildlife Warden of Andhra Pradesh.
2. No person shall form any tank for Aquaculture or for any other purposes.
3. Wherever Pisciculture was existing in private lands, as on the date of notification, fishing in traditional methods shall be permitted, without causing environmental hazard, till the Government acquires such private lands.
4. Right to do traditional Agriculture without using pesticides and chemicals.
5. Right to use the ordinary boats without motor for the movement of the people.
6. Right of way with existing Roads connecting main habitations and their maintenance by providing sufficient number of vents for the roads existing at the time of Notification of Kolleru Wildlife Sanctuary U/s. 18 of Wildlife (Protection) Act, 1972 without permitting new roads and culverts.
7. Right to maintain existing water courses and drains necessary to avert submersion of agricultural lands surrounding Kolleru Lake.
8. Other rights and conditions as specified U/s. 27 to 34 and other provisions of the Wildlife (Protection) Act, 1972.
9. Electricity connection shall be given for domestic use only and not for Aquaculture or any activity connected therewith.
10. The 'D' form pattas granted or lease of land allowed in the area in favour of any assignee or lessee as the case may be including three societies viz., Gangaraju Fishermen Cooperative Society, Srungavarappadu; Sringavarappadu Fishermen Cooperative Society; Sanjay Gandhi Fishermen Cooperative Society, Srungavarappadu of Krishna District will be cancelled. The claimants are not entitled to any compensation under Wildlife (Protection) Act, 1972 as they were assigned the lands by the Government on free of land value.

11. D-Farm pattas to the extent of Ac.2882.00cts issued to the individuals as per G.O.Ms. No. 118 Revenue (Q) Dept., Dated:24-01-1976 in West Godavari District wherein they were permitted to construct fish tanks on the said lands are liable to be cancelled and these lands will be resumed under the provisions of Wildlife (Protection) Act, 1972. These D-Farm patta holders are not entitled for any compensation except exgratia as provided by the Government.
12. The annual Licences which are being issued by the Fisheries Department for fishery purpose indicating the areas allotted are to be discontinued.
13. Encroachments in conditional patta lands of Siddapuram village of Akiveedu Mandal are to be evicted.
14. The village site Poramboke of Siddapuram village of Akiveedu Mandal measuring Ac.16.67cts is hereby excluded from the jurisdiction of the Sanctuary.
15. Any other encroachments/activities which are not permitted specifically are liable to be removed/ stopped forthwith.

V. P. JAUHARI
PRINCIPAL SECRETARY TO GOVERNMENT

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Annexure - 4

Water quality monitoring data of Kolleru lake, inlet streams / drains and outlet

I. Kolleru Lake points:

Table – 1: pH Values - Lake points											
S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	CPCB Classification for designated best use			
									Class 'A'	Class 'B'	Class 'C'	Class 'D'
1	Gudivaka lanka	7.72	---	7.14	6.82	6.90	7.52	7.86	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Kokkiraya lanka	7.73	---	7.5	7.04	7.18	7.51	7.48				
3	Chettunnapadu	7.36	---	7.37	7.02	7.60	7.75	7.66				
4	Pedayedlagadi	7.90	7.52	---	7.9	7.56	7.77	7.27				
5	Chinayedlagadi	8.25	8.35	---	7.78	7.44	7.22	7.07				
6	Kolleti kota	8.07	7.73	---	7.86	7.84	7.93	7.16				
7	Circar canal	8.02	---	---	7.95	7.94	7.94	7.19				
8	Srungavarappadu	7.98	---	---	7.86	7.82	7.89	7.10				
9	Bird Sanctuary, Atapaka Village	---	8.45	---	7.65	7.86	7.85	7.01				
Table – 2: Dissolved Oxygen – Lake points												
1	Gudivaka lanka	6.00	---	6.60	3.70	7.10	6.20	6.00	>6.0	>5.0	>4.0	>4.0
2	Kokkiraya lanka	2.80	---	2.90	2.60	6.10	5.80	5.20				
3	Chettunnapadu	Nil	---	7.70	7.50	5.70	6.00	5.70				
4	Pedayedlagadi	2.70	0.60	---	2.30	4.80	6.10	6.30				
5	Chinayedlagadi	8.20	8.00	---	8.40	8.10	6.00	5.70				
6	Kolleti kota	4.80	3.70	---	3.40	3.10	5.50	5.60				
7	Circar canal	4.80	---	---	4.00	3.90	5.20	5.50				
8	Srungavarappadu	5.10	---	---	4.70	4.10	5.00	5.30				
9	Bird Sanctuary, Atapaka Village	---	7.80	---	4.70	8.50	7.00	6.80				
All values are expressed in mg/lit.												

Table – 3: Total Dissolved Solids – Lake points

S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	Drinking water Standards - IS 10500:2012	
									Acceptable Limit	Permissible Limit
1	Gudivaka lanka	1740	---	3880	650	745	780	1582	500	2000
2	Kokkiraya lanka	1900	---	1707	629	962	1266	2724		
3	Chettunnapadu	1660	---	1087	910	725	1288	1259		
4	Pedayedlagadi	1455	840	---	718	1264	1810	2422		
5	Chinayedlagadi	2400	2180	---	723	1774	1704	3073		
6	Kolleti kota	1660	1080	---	899	1004	1204	2053		
7	Circar canal	1587	---	---	809	1006	1294	2080		
8	Srungavarappadu	1781	---	---	1427	1113	1200	2070		
9	Bird Sanctuary, Atapaka Village	---	2180	---	530	1530	1656	1890		

All values are expressed in mg/lit.

Table – 4: Chemical Oxygen Demand – Lake points

S. No.	Location	04.08.2021& 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022
1	Gudivaka lanka	16	---	40	36	32	28	64
2	Kokkiraya lanka	8	---	20	20	24	20	104
3	Chettunnapadu	36	---	45	40	36	36	52
4	Pedayedlagadi	12	26	---	20	24	36	88
5	Chinayedlagadi	46	35	---	44	40	30	156
6	Kolleti kota	28	26	---	24	24	20	100
7	Circar canal	16	---	---	28	28	24	80
8	Srungavarappadu	4	---	---	32	30	16	92
9	Bird Sanctuary, Atapaka Village	---	41	---	28	24	28	84

All values are expressed in mg/lit.

Table – 5: Bio-chemical Oxygen Demand – Lake points

S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	CPCB Classification for designated best use			
									Class 'A'	Class 'B'	Class 'C'	Class 'D'
1	Gudivaka lanka	2.1	---	3.0	3.2	3.0	2.5	9.8	<2.0	<3.0	<3.0	-
2	Kokkiraya lanka	1.2	---	2.1	2.2	2.4	2.0	14.6				
3	Chettunnapadu	4.6	---	6.6	5.4	4.0	3.4	8.0				
4	Pedayedlagadi	1.6	4.2	---	2.2	2.9	3.4	13.0				
5	Chinayedlagadi	9.0	5.8	---	4.2	3.4	3.2	20.2				
6	Kolleti kota	2.7	5.2	---	2.6	2.2	2.0	14.0				
7	Circar canal	2.2	---	---	3.0	3.0	2.2	12.6				
8	Srungavarappadu	0.8	---	---	3.1	3.2	1.8	13.4				
9	Bird Sanctuary, Atapaka Village	---	6.4	---	3.0	2.8	2.4	11.6				

All values are expressed in mg/lit.

Table – 6: Phosphates – Lake points

S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022
1	Gudivaka lanka	0.83	---	0.29	0.31	0.30	0.09	0.12
2	Kokkiraya lanka	1.00	---	0.37	0.33	0.70	0.38	0.20
3	Chettunnapadu	1.00	---	0.36	0.35	0.79	0.98	0.24
4	Pedayedlagadi	0.78	0.62	---	0.38	1.12	0.54	0.41
5	Chinayedlagadi	1.16	1.32	---	1.04	1.05	0.84	0.63
6	Kolleti kota	0.82	0.93	---	0.46	1.00	0.61	0.55
7	Circar canal	0.87	---	---	0.65	1.21	0.68	0.76
8	Srungavarappadu	0.85	---	---	0.77	1.36	0.62	0.73
9	Bird Sanctuary, Atapaka Village	---	0.31	---	0.14	0.50	0.15	0.13

All values are expressed in mg/lit.

Table – 7: Total Coliform – Lake points

S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	CPCB Classification for designated best use			
									Class 'A'	Class 'B'	Class 'C'	Class 'D'
1	Gudivaka lanka	380	---	93	93	93	15	120	<50	<500	<5000	-
2	Kokkiraya lanka	240	---	15	20	15	28	240				
3	Chettunnapadu	210	---	20	20	21	11	120				
4	Pedayedlagadi	380	15	---	28	20	28	75				
5	Chinayedlagadi	210	20	---	11	7	11	230				
6	Kolleti kota	210	28	---	20	28	21	93				
7	Circar canal	460	---	---	11	15	15	75				
8	Srungavarappadu	240	---	---	15	20	20	240				
9	Bird Sanctuary, Atapaka Village	---	23	---	28	21	15	380				

All values are expressed MPN / 100 ml.

Table – 8: Fecal Coli form – Lake points

S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022
1	Gudivaka lanka	<3	---	<3	<3	<3	<3	<3
2	Kokkiraya lanka	<3	---	<3	<3	<3	<3	<3
3	Chettunnapadu	<3	---	<3	<3	<3	<3	<3
4	Pedayedlagadi	<3	<3	---	<3	<3	<3	<3
5	Chinayedlagadi	<3	<3	---	<3	<3	<3	<3
6	Kolleti kota	<3	<3	---	<3	<3	<3	<3
7	Circar canal	<3	---	---	<3	<3	<3	<3
8	Srungavarappadu	<3	---	---	<3	<3	<3	<3
9	Bird Sanctuary, Atapaka Village	---	<3	---	<3	<3	<3	<3

All values are expressed MPN / 100 ml.

Table – 9 (a): Iron as Fe - Lake points										
S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	Drinking water Standards - IS 10500:2012	
									Acceptable Limit	Permissible Limit
1	Gudivaka lanka	0.1449	---	0.0079	0.0208	0.0370	0.0426	0.0330	0.3	No relaxation
2	Kokkiraya lanka	0.1638	---	0.0049	0.1601	0.0240	0.0309	0.0290		
3	Chettunnapadu	0.1899	---	0.0161	0.0175	0.0136	0.0314	0.0260		
4	Pedayedlagadi	0.1132	0.2673	---	0.0074	0.0172	0.0406	0.0299		
5	Chinayedlagadi	0.1278	0.3491	---	0.0118	0.0161	0.0502	0.0280		
6	Kolleti kota	0.1175	0.2757	---	0.0047	0.0178	0.0343	0.5500		
7	Circar canal	0.0987	---	---	0.0015	0.0149	0.0323	1.4100		
8	Srungavarappadu	0.1499	---	---	0.0151	0.0165	0.0376	0.1300		
9	Bird Sanctuary, Atapaka Village	---	0.7490	---	0.0087	0.0105	0.0317	0.0320		
All values are expressed in mg/lit.										

Table – 9 (b): Manganese as Mn - Lake points										
1	Gudivaka lanka	0.0064	---	0.0016	0.0005	0.0060	0.0074	0.0130	0.1	0.3
2	Kokkiraya lanka	0.0081	---	0.0047	0.0004	0.0015	0.0029	0.0120		
3	Chettunnapadu	0.3252	---	0.0010	0.0004	0.0014	0.0029	0.0110		
4	Pedayedlagadi	0.0033	0.0856	---	0.0013	0.0007	0.0029	0.0480		
5	Chinayedlagadi	0.0035	0.0370	---	0.0019	0.0005	0.0056	0.2300		
6	Kolleti kota	0.0077	0.0236	---	0.0014	BDL	0.0014	0.1250		
7	Circar canal	0.0029	---	---	0.0008	0.0017	0.0013	0.0700		
8	Srungavarappadu	0.0061	---	---	0.0028	0.0035	0.0059	0.0340		
9	Bird Sanctuary, Atapaka Village	---	0.0250	---	0.0005	0.0012	0.0034	0.0440		
All values are expressed in mg/lit.										

Table – 9 (c): Nickel as Ni - Lake points										
S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	Drinking water Standards IS 10500:2012	
									Acceptable Limit	Permissible Limit
1	Gudivaka lanka	0.0043	---	0.0014	0.0001	0.0010	0.0008	0.0080	0.02	No relaxation
2	Kokkiraya lanka	0.0049	---	0.0011	0.0007	0.0009	0.0008	0.0006		
3	Chettunnapadu	0.0058	---	0.0012	BDL	0.0003	0.0010	0.0006		
4	Pedayedlagadi	0.0042	0.0024	---	0.0015	0.0007	0.0008	0.0015		
5	Chinayedlagadi	0.0047	0.0024	---	0.0016	0.0009	0.0010	0.0005		
6	Kolleti kota	0.0043	0.0025	---	0.0001	0.0009	0.0009	0.0012		
7	Circar canal	0.0037	---	---	0.0001	0.0006	0.0008	0.0016		
8	Srungavarappadu	0.0046	---	---	0.0001	0.0031	0.0010	0.0130		
9	Bird Sanctuary, Atapaka Village	---	0.0042	---	0.0001	0.0007	0.0013	0.0006		
All values are expressed in mg/lit.										

Table – 9 (d): Total Chromium as Cr - Lake points										
1	Gudivaka lanka	0.0098	---	0.0013	0.0006	0.0017	0.0005	BDL	0.05	No relaxation
2	Kokkiraya lanka	0.0099	---	0.0002	0.0001	0.0004	0.0004	BDL		
3	Chettunnapadu	0.0038	---	0.0025	0.0001	0.0308	0.0004	BDL		
4	Pedayedlagadi	0.0088	0.0032	---	0.0002	0.0002	0.0003	0.0040		
5	Chinayedlagadi	0.0097	0.0033	---	0.0001	0.0001	0.0002	0.0001		
6	Kolleti kota	0.0089	0.0050	---	0.0004	BDL	0.0003	0.0070		
7	Circar canal	0.0075	---	---	0.0001	0.0002	0.0003	0.0014		
8	Srungavarappadu	0.0077	---	---	0.0003	0.0001	0.0003	0.0018		
9	Bird Sanctuary, Atapaka Village	---	0.0199	---	0.0009	0.0031	0.0002	0.0055		
All values are expressed in mg/lit.										

Table – 9 (e): Lead as Pb - Lake points										
S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	Drinking water Standards IS 10500:2012	
									Acceptable Limit	Permissible Limit
1	Gudivaka lanka	0.0029	---	0.0014	BDL	0.0014	0.0002	BDL	0.01	No relaxation
2	Kokkiraya lanka	0.0072	---	<0.0001	BDL	0.0006	0.0002	BDL		
3	Chettunnapadu	0.0024	---	<0.0001	BDL	0.0013	0.0003	BDL		
4	Pedayedlagadi	0.0010	0.0026	---	BDL	0.0003	0.0001	BDL		
5	Chinayedlagadi	0.0011	0.0027	---	BDL	0.0004	0.0002	BDL		
6	Kolleti kota	0.0011	0.0070	---	BDL	0.0002	0.0002	BDL		
7	Circar canal	0.0009	---	---	BDL	0.0003	0.0002	BDL		
8	Srungavarappadu	0.0029	---	---	BDL	0.0003	0.0003	BDL		
9	Bird Sanctuary, Atapaka Village	---	0.0039	---	BDL	0.0004	0.0002	BDL		
All values are expressed in mg/lit.										

Table – 9 (f): Copper as Cu - Lake points										
1	Gudivaka lanka	0.0097	---	0.0015	0.0015	0.0033	0.0031	0.0007	0.05	1.5
2	Kokkiraya lanka	0.0105	---	0.0013	0.0014	0.0025	0.0030	0.0005		
3	Chettunnapadu	0.0104	---	0.0013	0.0015	0.0037	0.0030	0.0007		
4	Pedayedlagadi	0.0062	0.0095	---	0.0015	0.0026	0.0020	0.0030		
5	Chinayedlagadi	0.0061	0.0078	---	0.0016	0.0015	0.0030	0.0020		
6	Kolleti kota	0.0072	0.0106	---	0.0001	0.0013	0.0030	0.0030		
7	Circar canal	0.0041	---	---	0.0001	0.0021	0.0030	0.0030		
8	Srungavarappadu	0.0112	---	---	0.0014	0.0014	0.0030	0.0029		
9	Bird Sanctuary, Atapaka Village	---	0.0080	---	0.0018	0.0037	0.0030	0.0026		
All values are expressed in mg/lit.										

Table – 9 (g): Cadmium as Cd - Lake points										
S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	Drinking water Standards IS 10500:2012	
									Acceptable Limit	Permissible Limit
1	Gudivaka lanka	0.0001	---	0.0061	BDL	BDL	BDL	BDL	0.003	No relaxation
2	Kokkiraya lanka	0.0002	---	0.0050	BDL	BDL	BDL	BDL		
3	Chettunnapadu	0.0001	---	0.0064	BDL	BDL	BDL	BDL		
4	Pedayedlagadi	0.0001	0.0009	---	0.0028	BDL	BDL	BDL		
5	Chinayedlagadi	0.0001	0.0009	---	0.0046	BDL	BDL	BDL		
6	Kolleti kota	0.0001	0.0018	---	0.0037	BDL	BDL	BDL		
7	Circar canal	0.0001	---	---	0.0038	BDL	BDL	0.0010		
8	Srungavarappadu	0.0001	---	---	0.0044	BDL	BDL	BDL		
9	Bird Sanctuary, Atapaka Village	---	0.0003	---	0.0024	BDL	BDL	BDL		
All values are expressed in mg/lit.										

Table – 9 (h): Arsenic as As - Lake points										
1	Gudivaka lanka	0.0038	---	0.0031	0.0047	0.0022	0.0023	0.0020	0.01	0.05
2	Kokkiraya lanka	0.0033	---	0.0048	0.0026	0.0032	0.0022	0.0040		
3	Chettunnapadu	0.0030	---	0.0077	0.0023	0.0065	0.0037	0.0020		
4	Pedayedlagadi	0.0002	0.0016	---	0.0048	0.0022	0.0023	0.0022		
5	Chinayedlagadi	0.0004	0.0027	---	0.0041	0.0032	0.0034	0.0028		
6	Kolleti kota	0.0003	0.0020	---	0.0019	0.0046	0.0027	0.0047		
7	Circar canal	0.0002	---	---	0.0047	0.0023	0.0027	0.0017		
8	Srungavarappadu	0.0028	---	---	0.0061	0.0003	0.0027	0.0030		
9	Bird Sanctuary, Atapaka Village	---	0.0028	---	0.0024	0.0026	0.0030	0.0080		
All values are expressed in mg/lit.										

Table – 9 (i): Mercury as Hg - Lake points										
S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	Drinking water Standards IS 10500:2012	
									Acceptable Limit	Permissible Limit
1	Gudivaka lanka	BDL	---	0.0001	BDL	BDL	BDL	BDL	0.001	No relaxation
2	Kokkiraya lanka	BDL	---	0.0001	BDL	BDL	BDL	BDL		
3	Chettunnapadu	BDL	---	0.0001	BDL	BDL	BDL	BDL		
4	Pedayedlagadi	BDL	BDL	---	BDL	BDL	BDL	BDL		
5	Chinayedlagadi	BDL	BDL	---	BDL	BDL	BDL	BDL		
6	Kolleti kota	BDL	0.0010	---	BDL	BDL	BDL	BDL		
7	Circar canal	BDL	---	---	BDL	BDL	BDL	BDL		
8	Srungavarappadu	BDL	---	---	BDL	BDL	BDL	BDL		
9	Bird Sanctuary, Atapaka Village	---	0.0010	---	BDL	BDL	BDL	BDL		
All values are expressed in mg/lit.										

Table – 9 (j): Zinc as Zn - Lake points										
1	Gudivaka lanka	BDL	---	0.0019	0.0008	0.0046	0.0040	0.0130	5.0	15
2	Kokkiraya lanka	BDL	---	0.0018	0.0017	0.0019	0.0064	0.0080		
3	Chettunnapadu	BDL	---	0.0024	0.0005	0.0269	0.0050	0.0120		
4	Pedayedlagadi	BDL	0.0033	---	0.0015	0.0206	0.0016	0.0080		
5	Chinayedlagadi	BDL	0.0007	---	0.0017	0.0069	0.0036	0.0042		
6	Kolleti kota	BDL	0.0039	---	0.0015	0.0010	0.0037	0.0069		
7	Circar canal	BDL	---	---	0.0014	0.0010	0.0054	0.1240		
8	Srungavarappadu	BDL	---	---	0.0019	0.0042	0.0038	0.0490		
9	Bird Sanctuary, Atapaka Village	---	0.0014	---	0.0019	0.0229	0.0042	0.0090		
All values are expressed in mg/lit.										

II. Kolleru Lake inlet streams / drains:

Table- 10: Mondikodu drain, Grampanchayat - Lake inlet											
S. No.	Parameters	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	CPCB Classification for designated best use			
									Class 'A'	Class 'B'	Class 'C'	Class 'D'
General												
1	pH	7.54	---	7.24	7.03	7.06	7.39	7.4	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	5.4	---	7.0	6.0	4.9	5	5.7	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	12	---	30	28	20	32	68	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	1.8	---	3.2	2.6	2.0	3.9	10.0	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	0.76	---	0.13	0.51	0.29	0.11	0.02	-	-	-	-
6	Total Coliform (MPN / 100 ml)	440	---	28	15	20	21	230	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	---	<3	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		Permissible Limit	
8	Total Dissolved Solids (mg/lit)	1722	---	2639	756	763	1208	1155	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1161	---	0.0110	0.0224	0.0193	0.0356	0.036	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0114	---	0.0015	0.0004	0.0027	0.0044	0.031	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0041	---	0.0001	0.0001	0.0008	0.0009	0.001	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0073	---	0.0001	0.0001	0.0004	0.0004	0.0002	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0051	---	0.0006	BDL	0.0005	0.0002	BDL	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0096	---	0.0013	0.0017	0.0032	0.003	0.002	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0001	---	0.0039	BDL	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0037	---	0.0062	0.0044	0.002	0.0023	0.01	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	---	BDL	BDL	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	BDL	---	0.0020	0.2413	0.0017	0.0050	0.014	5		15	

Table - 11: Jodikaluva drain - Lake inlet												
S. No.	**Parameters**	**04.08.2021 & 06.08.2021**	**25.08.2021**	**16.09.2021**	**11.10.2021 & 23.10.2021**	**11.11.2021 & 17.11.2021**	**13.12.2021 & 23.12.2021**	**04.01.2022 & 06.01.2022**	**CPCB Classification for designated best use**			
									Class 'A'	**Class 'B'**	**Class 'C'**	**Class 'D'**
General												
1	pH	7.76	---	7.32	7.05	7.23	7.46	7.64	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	7.2	---	4.8	4.9	6.1	5.6	5.4	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	52	---	32	30	28	24	60	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	7.2	---	3.5	2.8	2.6	2.2	8.8	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	1.28	---	1.01	1.74	1.71	0.96	0.70	-	-	-	-
6	Total Coliform (MPN / 100 ml)	470	---	28	28	28	15	93	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	---	<3	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		**Permissible Limit**	
8	Total Dissolved Solids (mg/lit)	2432	---	1024	945	739	1382	1806	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1361	---	0.0090	0.0185	0.0213	0.0381	0.026	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0094	---	0.0017	0.0003	0.0024	0.0036	0.009	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0046	---	0.0010	0.0001	0.0006	0.0013	0.0005	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0082	---	0.0013	0.0007	0.0005	0.0006	BDL	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0014	---	BDL	BDL	0.0326	0.0003	BDL	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0083	---	0.0013	0.0016	0.0035	0.003	0.0004	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0001	---	0.0059	BDL	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0039	---	0.0063	0.0043	0.0015	0.0044	0.003	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	---	BDL	BDL	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	BDL	---	0.0021	0.0516	0.0044	0.0034	0.009	5		15	

Table - 12: Bulusuvagu drain - Lake inlet												
S. No.	**Parameters**	**04.08.2021 & 06.08.2021**	**25.08.2021**	**16.09.2021**	**11.10.2021 & 23.10.2021**	**11.11.2021 & 17.11.2021**	**13.12.2021 & 23.12.2021**	**04.01.2022 & 06.01.2022**	**CPCB Classification for designated best use**			
									Class 'A'	**Class 'B'**	**Class 'C'**	**Class 'D'**
General												
1	pH	7.31	---	7.44	7.18	7.50	7.58	7.45	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	2.1	---	2.4	2.6	6.1	5.5	5.5	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	32	---	24	20	20	20	104	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	4.1	---	2	2.4	2.1	2.4	15.0	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	1.16	---	0.18	0.64	0.22	0.21	0.02	-	-	-	-
6	Total Coliform (MPN / 100 ml)	460	---	11	28	20	15	120	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	---	<3	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		**Permissible Limit**	
8	Total Dissolved Solids (mg/lit)	2673	---	1396	1102	618	768	2538	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1022	---	0.0160	0.0240	0.0146	0.0454	0.049	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0060	---	0.0056	0.0007	0.001	0.0018	0.01	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0037	---	0.0012	0.0005	0.0006	0.0008	0.0009	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0061	---	0.0015	0.0003	0.0006	0.0004	BDL	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0023	---	BDL	BDL	0.0002	0.0001	BDL	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0087	---	0.0013	0.0011	0.0037	0.0025	0.0004	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0001	---	0.0033	BDL	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0009	---	0.0038	0.0016	0.0017	0.0013	0.0009	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	---	BDL	BDL	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	BDL	---	0.0016	0.2266	0.0002	0.0051	0.01	5		15	

Table - 13: Tokalapalli drain - Lake inlet												
S. No.	**Parameters**	**04.08.2021 & 06.08.2021**	**25.08.2021**	**16.09.2021**	**11.10.2021 & 23.10.2021**	**11.11.2021 & 17.11.2021**	**13.12.2021 & 23.12.2021**	**04.01.2022 & 06.01.2022**	**CPCB Classification for designated best use**			
									Class 'A'	**Class 'B'**	**Class 'C'**	**Class 'D'**
General												
1	pH	7.76	---	7.40	7.07	7.63	7.43	7.23	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	5.5	---	5.2	5.4	5.1	5	5.7	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	20	---	20	24	16	10	84	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	2.4	---	2.2	2.2	2.0	2.0	12.0	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	0.10	---	0.12	0.41	0.25	0.03	0.05	-	-	-	-
6	Total Coliform (MPN / 100 ml)	440	---	7	11	15	39	240	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	---	<3	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		**Permissible Limit**	
8	Total Dissolved Solids (mg/lit)	260	---	549	406	382	359	1302	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1521	---	0.0050	0.0161	0.0127	0.0208	0.029	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0070	---	0.0020	0.0005	0.0008	0.0013	0.013	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0054	---	0.0006	0.0006	0.0005	0.0013	0.0004	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0094	---	0.0014	0.0017	0.0004	0.0007	BDL	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0023	---	BDL	BDL	0.0003	0.0002	BDL	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0120	---	0.0006	0.0017	0.0037	0.003	0.0008	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0001	---	0.0021	BDL	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0009	---	0.0030	0.0010	0.0069	0.001	0.0007	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	---	BDL	BDL	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	BDL	---	0.0019	0.0894	0.0034	0.0066	0.013	5		15	

Table - 14: Pandikodu drain - Lake inlet												
S. No.	**Parameters**	**04.08.2021 & 06.08.2021**	**25.08.2021**	**16.09.2021**	**11.10.2021 & 23.10.2021**	**11.11.2021 & 17.11.2021**	**13.12.2021 & 23.12.2021**	**04.01.2022 & 06.01.2022**	**CPCB Classification for designated best use**			
									Class 'A'	**Class 'B'**	**Class 'C'**	**Class 'D'**
General												
1	pH	7.49	---	7.34	7.03	7.20	7.66	7.21	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	6.4	---	4.9	4.8	1.5	5.2	5.6	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	4	---	34	36	20	16	56	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	0.8	---	4.9	4.2	2.2	2.2	8.2	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	0.11	---	0.33	0.54	0.80	0.03	0.04	-	-	-	-
6	Total Coliform (MPN / 100 ml)	380	---	21	21	11	20	210	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	---	<3	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		**Permissible Limit**	
8	Total Dissolved Solids (mg/lit)	3054	---	1491	934	424	350	384	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1010	---	0.0380	0.0322	0.0089	0.02	0.022	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0050	---	0.0044	0.0005	0.0009	0.0031	0.01	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0032	---	0.0012	0.0001	0.0001	0.0004	0.0004	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0058	---	0.0015	0.0001	0.0209	0.0005	BDL	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0025	---	BDL	BDL	0.0007	0.0003	BDL	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0096	---	0.0011	0.0020	0.0025	0.003	0.001	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0001	---	0.0026	BDL	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0009	---	0.0004	0.0021	0.0005	0.0012	0.0008	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	---	BDL	BDL	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	BDL	---	0.0018	0.0006	0.0185	0.0072	0.014	5		15	

Table - 15: Kovvali drain - Lake inlet												
S. No.	**Parameters**	**04.08.2021 & 06.08.2021**	**25.08.2021**	**16.09.2021**	**11.10.2021 & 23.10.2021**	**11.11.2021 & 17.11.2021**	**13.12.2021 & 23.12.2021**	**04.01.2022 & 06.01.2022**	**CPCB Classification for designated best use**			
									Class 'A'	**Class 'B'**	**Class 'C'**	**Class 'D'**
General												
1	pH	7.62	---	7.12	7.30	7.76	7.96	7.32	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	6.4	---	7.4	6.5	6.0	5.9	5.2	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	12	---	36	32	32	24	68	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	1.6	---	4.5	3.9	4.0	2.6	9.6	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	0.89	---	0.08	0.39	0.22	0.46	0.02	-	-	-	-
6	Total Coliform (MPN / 100 ml)	440	---	28	15	28	20	210	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	---	<3	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		**Permissible Limit**	
8	Total Dissolved Solids (mg/lit)	350	---	643	620	386	612	912	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1650	---	0.0050	0.0211	0.0131	0.0284	0.019	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0062	---	0.0027	0.0002	0.0013	0.001	0.008	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0058	---	0.0014	0.0001	0.0003	0.0007	0.0002	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0111	---	0.0010	0.0002	0.0018	0.0003	BDL	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0033	---	0.0013	BDL	0.0012	0.0002	BDL	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0120	---	0.0010	0.0015	0.0036	0.003	0.0006	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0002	---	0.0027	BDL	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0015	---	0.0039	0.0014	0.0066	0.0023	0.0005	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	---	BDL	BDL	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	BDL	---	0.0017	0.0004	0.0369	0.0049	0.011	5		15	

Table - 16: East Tammileru - Lake inlet												
S. No.	**Parameters**	**04.08.2021 & 06.08.2021**	**25.08.2021**	**16.09.2021**	**11.10.2021 & 23.10.2021**	**11.11.2021 & 17.11.2021**	**13.12.2021 & 23.12.2021**	**04.01.2022 & 06.01.2022**	**CPCB Classification for designated best use**			
									Class 'A'	**Class 'B'**	**Class 'C'**	**Class 'D'**
General												
1	pH	7.58	---	7.30	7.40	7.43	7.75	7.17	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	7.5	---	8.4	5.5	8.0	5.6	5.4	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	16	---	28	24	28	30	60	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	2.2	---	4.7	2.8	2.4	3.2	9.2	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	0.21	---	0.05	0.70	0.20	0.26	0.05	-	-	-	-
6	Total Coliform (MPN / 100 ml)	380	---	20	20	21	28	93	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	---	<3	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		**Permissible Limit**	
8	Total Dissolved Solids (mg/lit)	530	---	368	543	610	789	476	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1667	---	0.0016	0.0213	0.0161	0.038	0.019	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0156	---	0.0004	0.0008	0.0006	0.0026	0.008	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0058	---	0.0010	0.0068	0.0006	0.0007	0.0003	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0111	---	0.0011	0.0002	0.0002	0.0003	BDL	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0047	---	BDL	BDL	0.0004	0.0001	BDL	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0170	---	0.0007	0.0015	0.0011	0.002	0.0008	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0002	---	0.0016	BDL	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0028	---	0.0028	0.0014	0.0017	0.0012	0.0013	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	---	BDL	BDL	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	0.0023	---	0.0011	0.0101	0.0011	0.0024	0.012	5		15	

Table - 17: West Tammileru - Lake inlet												
S. No.	Parameters	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	CPCB Classification for designated best use			
									Class 'A'	Class 'B'	Class 'C'	Class 'D'
General												
1	pH	7.69	---	7.39	7.42	7.47	7.84	7.64	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	5.2	---	6.3	6.0	6.9	5.7	5.3	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	24	---	32	30	32	16	88	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	2.8	---	2.2	3.6	3.2	1.8	12.0	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	0.17	---	0.09	0.29	0.69	0.03	0.80	-	-	-	-
6	Total Coliform (MPN / 100 ml)	460	---	28	28	15	15	120	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	---	<3	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		Permissible Limit	
8	Total Dissolved Solids (mg/lit)	482	---	472	538	632	642	1008	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1520	---	BDL	0.0202	0.0189	0.0236	0.03	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0110	---	0.0004	0.0006	0.0016	0.0009	0.011	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0074	---	0.0010	0.0009	0.0009	0.0004	0.0008	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0097	---	0.0008	0.0003	0.0002	0.0002	BDL	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0062	---	BDL	BDL	0.0001	0.0003	BDL	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0150	---	0.0007	0.0020	0.0023	0.0029	0.0009	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0003	---	0.0029	BDL	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0044	---	0.0007	0.0070	0.0024	0.0012	0.0033	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	---	BDL	BDL	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	0.0036	---	0.0018	0.0014	0.0021	0.0037	0.01	5		15	

Table - 18: Chandrayya drain, Gudivada - Lake inlet												
S. No.	**Parameters**	**04.08.2021 & 06.08.2021**	**25.08.2021**	**16.09.2021**	**11.10.2021 & 23.10.2021**	**11.11.2021 & 17.11.2021**	**13.12.2021 & 23.12.2021**	**04.01.2022 & 06.01.2022**	**CPCB Classification for designated best use**			
									Class 'A'	**Class 'B'**	**Class 'C'**	**Class 'D'**
General												
1	pH	7.24	---	---	7.01	6.58	7.79	8.19	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	3.5	---	---	4.0	6.8	6.2	5.5	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	32	---	---	20	16	12	20	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	3.2	---	---	2.4	2.7	0.8	4.0	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	0.23	---	---	0.22	1.82	0.27	0.30	-	-	-	-
6	Total Coliform (MPN / 100 ml)	150	---	---	21	15	21	240	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	---	---	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		**Permissible Limit**	
8	Total Dissolved Solids (mg/lit)	550	---	---	547	585	493	485	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1660	---	---	0.0082	0.0208	0.0224	0.032	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0067	---	---	0.0015	0.0009	0.0013	0.032	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0055	---	---	0.0001	0.0019	0.0005	0.004	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0106	---	---	0.0002	0.0001	0.0002	0.006	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0023	---	---	BDL	BDL	0.0002	0.001	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0088	---	---	0.0010	0.0021	0.0037	0.0039	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0002	---	---	0.0023	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0004	---	---	0.0025	0.0034	0.0017	0.021	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	---	---	0.0001	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	BDL	---	---	0.0020	0.0043	0.0045	0.005	5		15	

Table - 19: Budameru drain - Lake inlet												
S. No.	**Parameters**	**04.08.2021 & 06.08.2021**	**25.08.2021**	**16.09.2021**	**11.10.2021 & 23.10.2021**	**11.11.2021 & 17.11.2021**	**13.12.2021 & 23.12.2021**	**04.01.2022 & 06.01.2022**	**CPCB Classification for designated best use**			
									Class 'A'	**Class 'B'**	**Class 'C'**	**Class 'D'**
General												
1	pH	7.12	---	---	6.93	7.19	7.75	7.18	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	3.5	---	---	3.0	3.4	5.5	5.6	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	8	---	---	16	20	20	56	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	1.4	---	---	1.8	2.0	2.0	8.6	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	0.64	---	---	0.40	1.00	0.52	0.48	-	-	-	-
6	Total Coliform (MPN / 100 ml)	210	---	---	28	21	15	210	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	---	---	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		**Permissible Limit**	
8	Total Dissolved Solids (mg/lit)	732	---	---	607	663	785	863	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1240	---	---	0.0057	0.0288	0.0343	0.046	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0040	---	---	0.0008	0.0008	0.0028	0.066	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0047	---	---	0.0001	0.001	0.0008	0.0007	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0092	---	---	0.0001	0.0001	0.0004	0.0006	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0015	---	---	BDL	BDL	0.0003	0.002	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0063	---	---	0.0012	0.0014	0.0036	0.0035	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0001	---	---	0.0033	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0003	---	---	0.0038	0.0023	0.0014	0.0017	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	---	---	BDL	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	BDL	---	---	0.0015	0.0025	0.0062	0.007	5		15	

Table - 20: Narasannapalem drain - Lake inlet												
S. No.	**Parameters**	**04.08.2021 & 06.08.2021**	**25.08.2021**	**16.09.2021**	**11.10.2021 & 23.10.2021**	**11.11.2021 & 17.11.2021**	**13.12.2021 & 23.12.2021**	**04.01.2022 & 06.01.2022**	**CPCB Classification for designated best use**			
									Class 'A'	**Class 'B'**	**Class 'C'**	**Class 'D'**
General												
1	pH	7.36	---	---	7.74	7.50	7.28	7.17	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	7.0	---	---	7.3	3.7	6.8	6.5	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	8	---	---	28	24	24	60	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	1.2	---	---	2.9	2.8	2.2	9.2	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	0.57	---	---	0.75	0.37	0.92	0.89	-	-	-	-
6	Total Coliform (MPN / 100 ml)	460	---	---	15	28	28	150	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	---	---	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		**Permissible Limit**	
8	Total Dissolved Solids (mg/lit)	675	---	---	589	553	668	673	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1300	---	---	0.0077	0.0194	0.0373	0.079	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0042	---	---	0.0005	0.0016	0.0011	0.034	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0047	---	---	0.0001	0.0006	0.001	0.0017	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0099	---	---	0.0002	0.0001	0.0002	0.0024	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0014	---	---	BDL	BDL	0.0004	0.0003	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0075	---	---	0.0002	0.0019	0.0035	0.0039	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0001	---	---	0.0038	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0003	---	---	0.0042	0.0018	0.0026	0.0033	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	---	---	0.0001	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	BDL	---	---	0.0015	0.0082	0.0063	0.05	5		15	

Table - 21: Polaraju drain - Lake inlet												
S. No.	**Parameters**	**04.08.2021 & 06.08.2021**	**25.08.2021**	**16.09.2021**	**11.10.2021 & 23.10.2021**	**11.11.2021 & 17.11.2021**	**13.12.2021 & 23.12.2021**	**04.01.2022 & 06.01.2022**	**CPCB Classification for designated best use**			
									Class 'A'	**Class 'B'**	**Class 'C'**	**Class 'D'**
General												
1	pH	7.99	8.09	---	7.45	7.52	7.99	7.85	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	4.5	6.3	---	5.0	6.7	6.3	6.0	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	36	30	---	40	28	32	36	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	5.0	5.3	---	4	2.3	3.0	5.4	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	0.94	0.80	---	0.91	1.13	0.83	0.53	-	-	-	-
6	Total Coliform (MPN / 100 ml)	240	28	---	7	11	39	210	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	<3	<3	---	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		**Permissible Limit**	
8	Total Dissolved Solids (mg/lit)	2710	1520	---	1549	582	1520	2305	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1050	0.4300	---	0.0128	0.0286	0.0502	0.043	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0028	0.0460	---	0.0026	0.0096	0.0281	0.176	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0039	0.0027	---	0.0001	0.0007	0.0009	0.0004	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0085	0.0034	---	0.0003	0.0346	0.0004	0.0003	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0010	0.0026	---	BDL	0.0012	0.0002	BDL	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0055	0.0085	---	0.0011	0.0033	0.002	0.0022	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0001	0.0001	---	0.0031	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0003	0.0018	---	0.0042	0.0023	0.0024	0.0017	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	BDL	---	BDL	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	BDL	0.0005	---	0.0016	0.0033	0.0054	0.006	5		15	

Table - 22: Chandraiah drain, Polukonda village												
S. No.	Parameters	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	CPCB Classification for designated best use			
									Class 'A'	Class 'B'	Class 'C'	Class 'D'
General												
1	pH	---	7.62	---	7.84	7.64	7.92	7.37	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	---	6.0	---	3.7	4.0	6.9	5.2	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	---	27	---	36	32	28	64	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	---	4.6	---	3.8	3.2	2.4	9.4	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	---	0.72	---	0.53	0.40	0.99	0.58	-	-	-	-
6	Total Coliform (MPN / 100 ml)	---	23	---	20	15	11	120	<50	<500	<5000	-
7	Fecal Coliform (MPN / 100 ml)	---	<3	---	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		Permissible Limit	
8	Total Dissolved Solids (mg/lit)	---	700	---	1016	582	1002	608	500		2000	
Metals												
9	Iron as Fe (mg/lit)	---	0.0296	---	0.0025	0.0192	0.0292	0.057	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	---	0.0430	---	0.0002	0.0004	0.003	0.013	0.1		0.3	
11	Nickel as Ni (mg/lit)	---	0.0032	---	0.0001	0.0007	0.0007	0.0006	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	---	0.0038	---	0.0001	0.0013	0.0002	0.001	0.05		No relaxation	
13	Lead as Pb (mg/lit)	---	0.0035	---	BDL	BDL	0.0002	0.0002	0.01		No relaxation	
14	Copper as Cu (mg/lit)	---	0.0080	---	0.0013	0.0015	0.0035	0.0031	0.05		1.5	
15	Cadmium as Cd (mg/lit)	---	0.0002	---	0.0045	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	---	0.0022	---	0.0008	0.0019	0.0023	0.0017	0.01		0.05	
17	Mercury as Hg (mg/lit)	---	0.0020	---	BDL	BDL	BDL	BDL	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	---	0.0200	---	0.0016	0.0025	0.0024	0.004	5		15	

III. Outlet of Kolleru Lake - Upputeru:

Table - 23: Upputeru - Outlet											
S. No.	Location	04.08.2021 & 06.08.2021	25.08.2021	16.09.2021	11.10.2021 & 23.10.2021	11.11.2021 & 17.11.2021	13.12.2021 & 23.12.2021	04.01.2022 & 06.01.2022	CPCB Classification for designated best use			
									Class 'A'	Class 'B'	Class 'C'	Class 'D'
General												
1	pH	---	6.96	---	7.67	7.90	7.21	7.71	6.5 - 8.5		6.0 - 9.0	6.5 - 8.5
2	Dissolved Oxygen (mg/lit)	---	3.10	---	3.80	3.40	5.00	5.20	>6.0	>5.0	>4.0	>4.0
3	Chemical Oxygen Demand (mg/lit)	---	28	---	40	28	32	76	-	-	-	-
4	Bio-chemical Oxygen Demand (mg/lit)	---	5.4	---	3.8	2.4	3.4	10.4	<2.0	<3.0	<3.0	-
5	Phosphates (mg/lit)	---	0.83	---	0.60	0.91	1.00	0.54	-	-	-	-
6	Total Coli form (MPN / 100 ml)	---	20	---	15	15	11	210	<50	<500	<5000	-
7	Fecal Coli form (MPN / 100 ml)	---	<3	---	<3	<3	<3	<3	-	-	-	-
									Drinking water Standards IS 10500:2012			
									Acceptable Limit		Permissible Limit	
8	Total Dissolved Solids (mg/lit)	---	1220	---	820	1064	1662	1860	500		2000	
Metals												
9	Iron as Fe (mg/lit)	0.1227	0.2264	---	0.0074	0.0248	0.0350	0.0530	0.3		No relaxation	
10	Manganese as Mn (mg/lit)	0.0063	0.0373	---	0.0006	0.0004	0.0053	0.0120	0.1		0.3	
11	Nickel as Ni (mg/lit)	0.0049	0.0026	---	0.0001	0.0002	0.0008	0.0004	0.02		No relaxation	
12	Total Chromium as Cr (mg/lit)	0.0089	0.0057	---	0.0003	0.0002	0.0003	0.0040	0.05		No relaxation	
13	Lead as Pb (mg/lit)	0.0026	0.0046	---	BDL	BDL	0.0002	BDL	0.01		No relaxation	
14	Copper as Cu (mg/lit)	0.0104	0.0087	---	0.0015	0.0005	0.0030	0.0010	0.05		1.5	
15	Cadmium as Cd (mg/lit)	0.0001	0.0001	---	0.0030	BDL	BDL	BDL	0.003		No relaxation	
16	Arsenic as As (mg/lit)	0.0025	0.0018	---	0.0023	BDL	0.0027	0.0020	0.01		0.05	
17	Mercury as Hg (mg/lit)	BDL	BDL	---	BDL	BDL	BDL	0.0004	0.001		No relaxation	
18	Zinc as Zn (mg/lit)	BDL	0.0127	---	0.0016	BDL	0.0052	0.0070	5		15	

Table - 24: Water quality of Budameru joining Kolleru Lake -Between Vijayawada and Kolleru Lake - January, 2022											
S. No.	**Location**	**Latitude**	**Longitude**	**pH**	**TDS**	**DO**	**BOD**	**COD**	**Phosphates**	**Total Coliform**	**Fecal Coliform**
1	Inner ring road	16°33'03.02"	80°37'01.37"	6.94	796	Nil	11.2	76	0.09	>2400	75
2	Sri Rajeswarinagar / Ayodhya nagar Railway Bridge	16°31'56.16"	80°38'01.75"	6.93	732	Nil	8	64	1.12	>2400	71
3	Gandhi Colony	16°31'37.52"	80°40'32.57"	7.03	727	1.2	7.4	60	1.08	1100	43
4	Gudavalli (V)	16°30'52.28"	80°44'56.48"	7.11	788	2.2	6.8	56	1.14	1300	64
5	Tarigopula	16°29'29.38"	80°49'56.29"	7.14	627	3.0	11.7	72	1.18	1100	39
6	Talaprolu - Vuyyur road, near Lankapadi Agraharam Bridge	16°30'17.38"	81°53'37.23"	7.20	711	3.4	12.2	88	0.86	1100	43
7	Puttagunta - Machilipatnam - Nuziveedu - Kalluru road	16°30'38.17"	80°57'30.92"	7.19	903	3.8	11.1	80	0.54	1300	64
8	Before confluence with Kolleru lake	16°33'45.79"	80°01'59.94"	7.34	867	3.7	9.3	76	0.85	1100	39
Standards: CPCB Classification for designated best use.											
Class A:				6.5 - 8.5	---	> 6.0	< 2.0	---	---	< 50	---
Class B:					---	> 5.0	< 3.0	---	---	< 500	---
Class C:				6.0 - 9.0	---	> 4.0		---	---	< 5000	---
Class D:				6.5 - 8.5	---	> 4.0	---	---	---	---	---
Note: All values are expressed in mg/lit, except pH, Total Coliform & Fecal Coliform. Total Colifrom & Fecal Coliform values are expressed in MPN / 100 ml.											

Annexure - 5

ANDHRA PRADESH POLLUTION CONTROL BOARD, ZONAL LABORATORY :: VIJAYAWADA

Physico chemical analysis report of Kolleru lake samples (Metals) for the month August - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe)	Manganese (Mn)	Nickel (Ni)	Chromium (Cr)	Lead (Pb)	Copper (Cu)	Cadmium (Cd)	Arsenic (As)	Mercury (Hg)	Zinc (Zn)
KRISHNA DISTRICT														
Y2108185	Sample collected from Upputeru at Tadinada Village	Lake	25/08/2021	26/08/2021	0.2264	0.0373	0.0026	0.0057	0.0046	0.0087	0.10	0.0018	BDL	0.0127
Y2108186	Sample collected from Kolletikota at Pachikalanarru Village	Lake	25/08/2021	26/08/2021	0.2757	0.0236	0.0025	0.0050	0.0070	0.0106	0.0018	0.0020	0.001	0.0039
Y2108187	Sample collected from drain (Polraju/Nagaraju) at Atapaka Village	Drain	25/08/2021	26/08/2021	0.4668	0.0412	0.0047	0.0225	0.0088	0.0162	0.003	0.0020	0.002	0.0057
Y2108188	Sample collected from in the Lake - Bird Life Sanctuary at Atapaka Village	Lake	25/08/2021	26/08/2021	0.749	0.0250	0.0042	0.0199	0.0039	0.0080	0.0003	0.0028	0.001	0.0014
Y2108189	Sample collected from in the Polraju drain at Kikaluru - Eluru Road	Drain	25/08/2021	26/08/2021	0.4311	0.0457	0.0027	0.0034	0.0026	0.0085	0.0001	0.0018	BDL	0.0005
Y2108190	Sample collected from in the Chinayedlagadi Lake at Kikaluru - Eluru Road	Lake	25/08/2021	26/08/2021	0.3491	0.0370	0.0024	0.0033	0.0027	0.0078	0.0009	0.0027	BDL	0.0007
Y2108191	Sample collected from in the Peddaedlagadi Lake at Kikaluru - Eluru Road	Lake	25/08/2021	26/08/2021	0.2673	0.0856	0.0024	0.0032	0.0026	0.0095	0.0009	0.0016	BDL	0.0033
Y2108192	Sample collected from in the Chandrnnah drain at Pohakonda Village	Drain	25/08/2021	26/08/2021	0.2963	0.0434	0.0032	0.0038	0.0035	0.0080	0.0002	0.0022	0.002	0.0200

Note: All results are expressed in mg/L except pH.

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Physico chemical analysis report of Kolleru lake samples (Metals) for the month August - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe)	Manganese (Mn)	Nickel (Ni)	Chromium (Cr)	Lead (Pb)	Copper (Cu)	Cadmium (Cd)	Arsenic (As)	Mercury (Hg)	Zinc (Zn)
WEST GODAVARI DISTRICT (ELURU)														
Y2108070	Madavapuram	Drain	06/08/2021	07/08/2021	0.1638	0.0089	0.0045	0.0337	0.0021	0.0099	0.0001	0.0016	BDL	BDL
:108071	Gudivakalanka	Lake	06/08/2021	07/08/2021	0.1449	0.0064	0.0043	0.0098	0.0029	0.0097	0.0001	0.0038	BDL	BDL
Y2108072	Mondikodu Gram Pachayat	Drain	06/08/2021	07/08/2021	0.1161	0.0114	0.0041	0.0073	0.0051	0.0096	0.0001	0.0037	BDL	BDL
Y2108073	Kokkirayalanka	Lake	06/08/2021	07/08/2021	0.1638	0.0081	0.0049	0.0099	0.0072	0.0105	0.0002	0.0033	0.002	BDL
Y2108074	Jodi Kaluva	Drain	06/08/2021	07/08/2021	0.1361	0.0094	0.0046	0.0082	0.0014	0.0083	0.0001	0.0039	BDL	BDL
Y2108075	Chettunnapadu	Lake	06/08/2021	07/08/2021	0.1899	0.3252	0.0058	0.0038	0.0024	0.0104	0.0001	0.0030	BDL	BDL
:108076	Bulusuvagu	Drain	06/08/2021	07/08/2021	0.1022	0.0058	0.0037	0.0061	0.0023	0.0087	0.0001	0.0009	BDL	BDL
Y2108077	Tokalapalli drain	Drain	06/08/2021	07/08/2021	0.1521	0.0068	0.0054	0.0094	0.0023	0.0119	0.0001	0.0009	BDL	BDL
Y2108078	Pandikodu drain	Drain	06/08/2021	07/08/2021	0.1009	0.0052	0.0032	0.0058	0.0025	0.0096	0.0001	0.0009	BDL	BDL
Y2108079	Bulusuvagu Panta Bodhi	Drain	06/08/2021	07/08/2021	0.1376	0.0059	0.0052	0.0093	0.0027	0.0108	0.0001	0.0015	BDL	BDL
Y2108080	Kovvali drain	Drain	06/08/2021	07/08/2021	0.1647	0.0062	0.0058	0.0111	0.0033	0.0121	0.0002	0.0015	BDL	BDL
Y2108081	Mondikodu	Drain	06/08/2021	07/08/2021	0.1517	0.0083	0.0056	0.0084	0.0027	0.0131	0.0002	0.0019	BDL	0.0025
:108082	East Tammileru	Drain	06/08/2021	07/08/2021	0.1667	0.0156	0.0058	0.0111	0.0047	0.0170	0.0002	0.0028	BDL	0.0023
Y2108083	West Thammileru	Drain	06/08/2021	07/08/2021	0.1515	0.0111	0.0074	0.0097	0.0062	0.0152	0.0003	0.0044	BDL	0.0036
KRISHNA DISTRICT														
Y2108052	Chandraiah drain	Drain	04/08/2021	05/08/2021	0.1664	0.0067	0.0055	0.0106	0.0023	0.0088	0.0002	0.0004	BDL	BDL
Y2108053	Budameru	Drain	04/08/2021	05/08/2021	0.1235	0.0040	0.0047	0.0092	0.0015	0.0063	0.0001	0.0003	BDL	BDL

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe)	Manganese (Mn)	Nickel (Ni)	Chromium (Cr)	Lead (Pb)	Copper (Cu)	Cadmium (Cd)	Arsenic (As)	Mercury (Hg)	Zinc (Zn)
Y2108054	Narasannapalem	Drain	04/08/2021	05/08/2021	0.1299	0.0042	0.0047	0.0099	0.0014	0.0075	0.0001	0.0003	BDL	BDL
Y2108055	Pedaedlagadi	Lake	04/08/2021	05/08/2021	0.1132	0.0033	0.0042	0.0088	0.0010	0.0062	0.0001	0.0002	BDL	BDL
Y2108056	Chinaedlagadi	Lake	04/08/2021	05/08/2021	0.1278	0.0035	0.0047	0.0097	0.0011	0.0061	0.0001	0.0004	BDL	BDL
Y2108057	Polaraj drain	Drain	04/08/2021	05/08/2021	0.1053	0.0028	0.0039	0.0085	0.0010	0.0055	0.0001	0.0003	BDL	BDL
Y2108058	Kolleti kota	Lake	04/08/2021	05/08/2021	0.1175	0.0077	0.0043	0.0089	0.0011	0.0072	0.0001	0.0003	BDL	BDL
Y2108059	Circar canal	Lake	04/08/2021	05/08/2021	0.0987	0.0029	0.0037	0.0075	0.0009	0.0041	0.0001	0.0002	BDL	BDL
Y2108060	Srungavarappadu	Lake	04/08/2021	05/08/2021	0.1499	0.0061	0.0046	0.0077	0.0029	0.0112	0.0001	0.0028	BDL	BDL
Y2108061	Upputeru	Lake	04/08/2021	05/08/2021	0.1227	0.0063	0.0049	0.0089	0.0026	0.0104	0.0002	0.0025	BDL	BDL

Note: All results are expressed in mg/L except pH.

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Metal analysis report of Kolleru lake samples for the month of September - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe) mg/L	Manganese (Mn) mg/L	Nickel (Ni) mg/L	Chromium (Cr) mg/L	Lead (Pb) mg/L	Copper (Cu) mg/L	Cadmium (Cd) mg/L	Arsenic (As) mg/L	Mercury (Hg) mg/L	Zinc (Zn) mg/L
WEST GODAVARI DISTRICT (ELURU)														
Y2109110	Gudivankalanka	Lake	16/09/2021	17/09/2021	0.0079	0.0016	0.0014	0.0013	0.0014	0.0015	0.0061	0.0031	0.0001	0.0019
Y2109111	Mandikodu drain confluence with Kolleru lake at Mandikodu Gram Pachayat of Gudivankanka Village	Drain	16/09/2021	17/09/2021	0.0109	0.0015	0.0001	0.0001	0.0006	0.0013	0.0039	0.0062	0.0001	0.0020
Y2109112	Kokkiraylanka	Lake	16/09/2021	17/09/2021	0.0049	0.0047	0.0011	0.0002	<0.0001	0.0013	0.0050	0.0048	0.0001	0.0018
Y2109113	Jedi Enkuru	Drain	16/09/2021	17/09/2021	0.0090	0.0017	0.0010	0.0013	<0.0001	0.0013	0.0059	0.0063	0.0001	0.0021
Y2109114	Chettumanapadu	Lake	16/09/2021	17/09/2021	0.0161	0.0010	0.0012	0.0025	<0.0001	0.0013	0.0064	0.0077	0.0001	0.0024
Y2109115	Pandikodu drain	Drain	16/09/2021	17/09/2021	0.0377	0.0044	0.0012	0.0018	<0.0001	0.0011	0.0026	0.0004	0.0001	0.0018
Y2109116	Tokalapalli drain	Drain	16/09/2021	17/09/2021	0.0050	0.0020	0.0006	0.0014	<0.0001	0.0006	0.0021	0.0030	<0.0001	0.0019
Y2109117	Bulusuvagu	Drain	16/09/2021	17/09/2021	0.0155	0.0056	0.0012	0.0018	<0.0001	0.0013	0.0033	0.0038	<0.0001	0.0016
Y2109153	Kovvali drain	Drain	17/09/2021	18/09/2021	0.0051	0.0027	0.0014	0.0010	0.0013	0.0010	0.0027	0.0039	0.0001	0.0017
Y2109154	East Tammileru	Drain	17/09/2021	18/09/2021	0.0016	0.0004	0.0010	0.0011	<0.0001	0.0007	0.0016	0.0028	<0.0001	0.0011
Y2109155	West Thammileru	Drain	17/09/2021	18/09/2021	BDL	0.0004	0.0010	0.0008	<0.0001	0.0007	0.0029	0.0007	<0.0001	0.0018

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Metal analysis report of Kolleru lake samples for the month of October - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe) mg/L	Manganese (Mn) mg/L	Nickel (Ni) mg/L	Chromium (Cr) mg/L	Lead (Pb) mg/L	Copper (Cu) mg/L	Cadmium (Cd) mg/L	Arsenic (As) mg/L	Mercury (Hg) mg/L	Zinc (Zn) mg/L
WEST GODAVARI DISTRICT (ELURU)														
Y2110209	Gudivakalanka	Lake	23/10/2021	23/10/2021	0.0208	0.0008	0.0001	0.0006	0.00005	0.0015	BDL	0.0047	BDL	0.0008
Y2110210	Mondikodu drain confluence with Kolleru lake at Mondikodu Gram Pachayat of Gudivakalanka Village	Drain	23/10/2021	23/10/2021	0.0224	0.0004	0.0001	0.0001	0.00005	0.0017	BDL	0.0044	BDL	0.2413
Y2110211	Kokkirayalanka	Lake	23/10/2021	23/10/2021	0.1601	0.0004	0.0007	0.0001	0.00008	0.0014	BDL	0.0026	BDL	0.0017
Y2110212	Jodi Kaluva	Drain	23/10/2021	23/10/2021	0.0185	0.0003	0.0001	0.0007	0.00001	0.0016	BDL	0.0043	BDL	0.0516
Y2110213	Chettunnagudu	Lake	23/10/2021	23/10/2021	0.0175	0.0004	0.00005	0.0001	0.00005	0.0015	BDL	0.0023	BDL	0.0008
Y2110214	Pamidikodu drain	Drain	23/10/2021	23/10/2021	0.0322	0.0005	0.0001	0.0001	0.00004	0.0020	BDL	0.0021	BDL	0.0006
Y2110215	Tokalapalli drain	Drain	23/10/2021	23/10/2021	0.0161	0.0005	0.0006	0.0017	0.00004	0.0017	BDL	0.0010	BDL	0.0894
Y2110216	Bulusuraga	Drain	23/10/2021	23/10/2021	0.0240	0.0007	0.0005	0.0003	0.00002	0.0011	BDL	0.0016	BDL	0.2266
Y2110217	Korvali drain	Drain	23/10/2021	23/10/2021	0.0211	0.0002	0.0001	0.0002	0.00002	0.0015	BDL	0.0014	BDL	0.0004
Y2110218	East Tamarileru	Drain	23/10/2021	23/10/2021	0.0213	0.0008	0.0008	0.0002	0.00007	0.0015	BDL	0.0014	BDL	0.0101
Y2110219	West Thammileru	Drain	23/10/2021	23/10/2021	0.0262	0.0006	0.0009	0.0003	0.00001	0.0020	BDL	0.0070	BDL	0.0014
KRISHNA DISTRICT														
Y2110070	Chandraiah drain at Teacher Colony, Satyanarayana Puram, Gudivada	Drain	11/10/2021	11/10/2021	0.0082	0.0015	0.0001	0.0002	<0.0001	0.0010	0.0023	0.0025	0.0001	0.0020
Y2110071	Bodameru drain, Machilipatnam-Nuzid, Kaluru Road No.28, Near Puttagunta Village	Drain	11/10/2021	11/10/2021	0.0057	0.0008	0.0001	0.0001	<0.0001	0.0012	0.0033	0.0038	<0.0001	0.0015

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe) mg/L	Manganese (Mn) mg/L	Nickel (Ni) mg/L	Chromium (Cr) mg/L	Lead (Pb) mg/L	Copper (Cu) mg/L	Cadmium (Cd) mg/L	Arsenic (As) mg/L	Mercury (Hg) mg/L	Zinc (Zn) mg/L
Y2110072	Narasannapalem drain at Gudivada Road, Arugolanu Village	Drain	11/10/2021	11/10/2021	0.0077	0.0005	0.0001	0.0002	<0.0001	0.0002	0.0038	0.0042	0.0001	0.0015
Y2110073	Polaraj drain at Kaluru-Eluru Road	Drain	11/10/2021	11/10/2021	0.0128	0.0026	0.0001	0.0003	<0.0001	0.0011	0.0031	0.0042	<0.0001	0.0016
Y2110074	Chinayedlagadi lake at Kaluru-Eluru Road	Lake	11/10/2021	11/10/2021	0.0118	0.0019	0.0016	0.0001	0.0001	0.0016	0.0046	0.0041	0.0001	0.0017
Y2110078	Peddayedlagadi lake at Kaluru-Eluru Road	Lake	11/10/2021	11/10/2021	0.0074	0.0013	0.0015	0.0002	<0.0001	0.0015	0.0028	0.0048	0.0001	0.0015
Y2110076	Chandraiah drain at Pokalonda Village	Drain	11/10/2021	11/10/2021	0.0025	0.0002	0.0001	0.0001	<0.0001	0.0013	0.0045	0.0008	<0.0001	0.0016
Y2110077	Burkumeru at Kudaravalli Village	Drain	11/10/2021	11/10/2021	0.0093	0.0013	0.0001	0.0003	0.0002	0.0013	0.0040	0.0075	<0.0001	0.0014
Y2110078	Holleti kota at Pichikalamarru Village	Lake	11/10/2021	11/10/2021	0.0067	0.0014	0.0001	0.0004	<0.0001	0.0001	0.0037	0.0019	<0.0001	0.0015
Y2110079	Circar canal at Pichikalamarru Village	Lake	11/10/2021	11/10/2021	0.0015	0.0008	0.0001	0.0001	<0.0001	0.0001	0.0038	0.0047	<0.0001	0.0014
Y2110080	Srungavarappadu drain at Srungavarappadu	Drain	11/10/2021	11/10/2021	0.0151	0.0028	0.0001	0.0003	<0.0001	0.0014	0.0044	0.0051	0.0001	0.0019
Y2110081	Polraju/Nagaraju) at Atapaka Village	Drain	11/10/2021	11/10/2021	0.0124	0.0018	0.0002	0.0001	<0.0001	0.0016	0.0056	0.0055	0.0001	0.0020
Y2110082	Lake - Bird Life Sanctuary at Atapaka Village	Lake	11/10/2021	11/10/2021	0.0087	0.0005	0.0001	0.0009	<0.0001	0.0018	0.0024	0.0024	0.0001	0.0019
Y2110083	Upputeru Tadinada Village	Lake	11/10/2021	11/10/2021	0.0074	0.0008	0.0001	0.0003	0.0001	0.0015	0.0030	0.0023	0.0001	0.0016

Note: All results are expressed in mg/L except pH.

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Metal analysis report of Kolleru lake samples for the month of November - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe) mg/L	Manganese (Mn) mg/L	Nickel (Ni) mg/L	Chromium (Cr) mg/L	Lead (Pb) mg/L	Copper (Cu) mg/L	Cadmium (Cd) mg/L	Arsenic (As) mg/L	Mercury (Hg) mg/L	Zinc (Zn) mg/L
WEST GODAVARI DISTRICT (ELURU)														
Y2111114	Gudivalalanka	Lake	17/11/2021	18/11/2021	0.0370	0.0060	0.0010	0.0017	0.0014	0.0033	0.00004	0.0022	BDL	0.0046
Y2111115	Mondikodu drain confluence with Kolleru lake at Mondikodu Gram Pachayat of Gudivalalanka Village	Drain	17/11/2021	18/11/2021	0.0193	0.0027	0.0008	0.0004	0.0006	0.0032	0.000002	0.0020	BDL	0.0017
Y2111116	Kokkirayalanka	Lake	17/11/2021	18/11/2021	0.0240	0.0015	0.0009	0.0004	0.0006	0.0025	BDL	0.0032	BDL	0.0019
Y2111117	Jedi Kaluva	Drain	17/11/2021	18/11/2021	0.0213	0.0024	0.0006	0.0005	0.0326	0.0035	0.00005	0.0015	BDL	0.0044
Y2111118	Chettinenipadu	Lake	17/11/2021	18/11/2021	0.0136	0.0014	0.0003	0.0308	0.0013	0.0037	0.00004	0.0068	BDL	0.0269
Y2111119	Pandikodu drain	Drain	17/11/2021	18/11/2021	0.0089	0.0009	0.0001	0.0209	0.0007	0.0025	0.00002	0.0005	BDL	0.0185
Y2111120	Tokalapalli drain	Drain	17/11/2021	18/11/2021	0.0127	0.0008	0.0005	0.0004	0.0003	0.0037	BDL	0.0069	BDL	0.0034
Y2111121	Buluvagu	Drain	17/11/2021	18/11/2021	0.0146	0.0010	0.0006	0.0006	0.0002	0.0037	BDL	0.0017	BDL	0.0002
Y2111122	Kovvali drain	Drain	17/11/2021	18/11/2021	0.0131	0.0013	0.0003	0.0018	0.0012	0.0036	0.00001	0.0066	BDL	0.0369
Y2111123	East Tammileru	Drain	17/11/2021	18/11/2021	0.0161	0.0006	0.0006	0.0002	0.0004	0.0011	BDL	0.0017	BDL	0.0011
Y2111124	West Thammileru	Drain	17/11/2021	18/11/2021	0.0189	0.0016	0.0009	0.0002	0.0001	0.0023	BDL	0.0024	BDL	0.0021
KRISHNA DISTRICT														
Y2111085	Chandraiah drain at Teacher Colony, Satyanarayana Puram, Gudivada	Drain	11/11/2021	12/11/2021	0.0308	0.0009	0.0019	0.0001	0.00004	0.0021	BDL	0.0034	BDL	0.0043
Y2111086	Budameru drain, Machilipatnam-Nuzid, Kaluru Road No.28, Near Puntagunta Village	Drain	11/11/2021	12/11/2021	0.0288	0.0008	0.0010	0.0001	0.00003	0.0014	BDL	0.0023	BDL	0.0025
Y2111087	Narasannapalem drain at Gudivada Road, Arugolanu Village	Drain	11/11/2021	12/11/2021	0.0194	0.0016	0.0006	0.0001	0.00004	0.0019	BDL	0.0018	BDL	0.0082
Y2111096	Polaraj drain at Kaluru-Eluru Road	Drain	16/11/2021	16/11/2021	0.0286	0.0096	0.0007	0.0346	0.0012	0.0033	BDL	0.0023	BDL	0.0033
Y2111097	Chinayedlagadi lake at Kaluru-Eluru Road	Lake	16/11/2021	16/11/2021	0.0161	0.0005	0.0009	0.0001	0.0004	0.0015	BDL	0.0032	BDL	0.0069

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe) mg/L	Manganese (Mn) mg/L	Nickel (Ni) mg/L	Chromium (Cr) mg/L	Lead (Pb) mg/L	Copper (Cu) mg/L	Cadmium (Cd) mg/L	Arsenic (As) mg/L	Mercury (Hg) mg/L	Zinc (Zn) mg/L
T2111058	Peddacheguda lake at Gikaluru-Eluru Road	Lake	10/11/2021	10/11/2021	0.0172	0.0007	0.0007	0.0002	0.0003	0.0026	BDL	0.0022	BDL	0.0206
T2111058	Chandraiah drain at Pokukonda Village	Drain	11/11/2021	12/11/2021	0.0192	0.0004	0.0007	0.0013	0.00007	0.0015	BDL	0.0019	BDL	0.0025
T2111059	Burlamma at Kadarevalli Village	Drain	11/11/2021	12/11/2021	0.0103	BDL	BDL	0.000007	BDL	0.00003	BDL	0.0009	BDL	BDL
T2111060	Kolleti lotta at Pichikalamarru Village	Lake	11/11/2021	12/11/2021	0.0178	0.00008	0.0009	0.00005	0.0002	0.0013	BDL	0.0046	BDL	0.0010
T2111061	Circar canal at Pichikalamarru Village	Lake	11/11/2021	12/11/2021	0.0149	0.0017	0.0006	0.0002	0.0003	0.0021	BDL	0.0023	BDL	0.0010
T2111062	Srungavarappadu drain at Srungavarappadu	Drain	11/11/2021	12/11/2021	0.0165	0.0035	0.0031	0.0001	0.0003	0.0014	BDL	0.0003	BDL	0.0042
T2111089	Pedraju (Nageraju) at Arapaka Village	Drain	10/11/2021	10/11/2021	0.0257	0.0008	0.0006	0.0022	0.0003	0.0016	BDL	0.0021	BDL	0.0006
T2111090	Lake - Bird Life Sanctuary at Arapaka Village	Lake	10/11/2021	10/11/2021	0.0105	0.0012	0.0007	0.0031	0.0004	0.0037	BDL	0.0026	BDL	0.0229
T2110063	Uppuleru Tadimada Village	Lake	11/11/2021	12/11/2021	0.0248	0.0004	0.0002	0.0002	BDL	0.0006	BDL	0.00006	BDL	BDL

SENIOR ENVIRONMENTAL SCIENTIST

ANDHRA PRADESH POLLUTION CONTROL BOARD, ZONAL LABORATORY :: VIJAYAWADA

Metal analysis report of Kolleru lake samples for the month of December - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe) mg/L	Manganese (Mn) mg/L	Nickel (Ni) mg/L	Chromium (Cr) mg/L	Lead (Pb) mg/L	Copper (Cu) mg/L	Cadmium (Cd) mg/L	Arsenic (As) mg/L	Mercury (Hg) mg/L	Zinc (Zn) mg/L
WEST GODAVARI DISTRICT (ELURU)														
Y2112088	Gudivakalanka	Lake	13/12/2021	14/12/2021	0.042609	0.007353	0.000829	0.000492	0.000232	0.003082	BDL	0.002261	BDL	0.004478
Y2112089	Mandikodu drain confluence with Kolleru lake at Mandikodu Gram Pachayat of Gudivakalanka Village	Drain	13/12/2021	14/12/2021	0.035801	0.004444	0.000886	0.000419	0.000224	0.002993	BDL	0.002268	BDL	0.005045
Y2112090	Kokkirapalanka	Lake	13/12/2021	14/12/2021	0.030867	0.002932	0.000779	0.000359	0.00023	0.002971	0.000001	0.00215	BDL	0.006390
Y2112091	Jedi Kalava	Drain	13/12/2021	14/12/2021	0.038065	0.003622	0.001258	0.000586	0.000251	0.003058	BDL	0.004398	BDL	0.003416
Y2112092	Chettumrapadu	Lake	13/12/2021	14/12/2021	0.031421	0.002892	0.000959	0.000358	0.000315	0.003072	BDL	0.003703	BDL	0.004998
Y2112093	Pandikodu drain	Drain	13/12/2021	14/12/2021	0.020939	0.003165	0.000362	0.000647	0.000313	0.003314	0.000008	0.001237	BDL	0.007188
Y2112094	Tokalapalli drain	Drain	13/12/2021	14/12/2021	0.020849	0.001396	0.00126	0.000732	0.000215	0.003388	BDL	0.001029	BDL	0.00668
Y2112095	Bulusuvagu	Drain	13/12/2021	14/12/2021	0.046397	0.001820	0.000789	0.00039	0.000155	0.002457	BDL	0.001333	BDL	0.005091
Y2112096	Kovuli drain	Drain	13/12/2021	14/12/2021	0.028411	0.001049	0.000739	0.000299	0.000179	0.002902	BDL	0.002280	BDL	0.004883
Y2112097	East Tammileru	Drain	13/12/2021	14/12/2021	0.037961	0.002673	0.000682	0.000327	0.000100	0.002107	BDL	0.001154	BDL	0.002386
Y2112098	West Thammileru	Drain	13/12/2021	14/12/2021	0.023569	0.000936	0.000347	0.000244	0.000326	0.002852	BDL	0.001201	BDL	0.003686
KRISHNA DISTRICT														
Y2112210	Chandraiah drain at Teacher Colony, Satyanarayana Puram, Gudivada	Drain	23/12/2021	24/12/2021	0.022429	0.001359	0.000491	0.000234	0.000183	0.003694	0.000001	0.001699	BDL	0.004516
Y2112211	Ruttaneru drain, Machilipatnam-Nuzid, Kaluru Road No.28, Near Puttagunta Village	Drain	23/12/2021	24/12/2021	0.034333	0.002863	0.000773	0.000417	0.000302	0.003614	BDL	0.001448	BDL	0.006182
Y2112212	Narasamapalem drain at Gudivada Road, Angaluru Village	Drain	23/12/2021	24/12/2021	0.037318	0.001154	0.000959	0.000213	0.000405	0.003477	BDL	0.002584	BDL	0.006345
Y2112213	Polaraj drain at Kikaluru-Eluru Road	Drain	23/12/2021	24/12/2021	0.050234	0.028139	0.000805	0.000375	0.000178	0.001954	BDL	0.002444	BDL	0.005382
Y2112214	Chinayedlagadi lake at Kikaluru-Eluru Road	Lake	23/12/2021	24/12/2021	0.050275	0.005609	0.001068	0.000237	0.000189	0.002825	BDL	0.00343	BDL	0.003611
Y2112215	Peddaedlagadi lake at Kikaluru-Eluru Road	Lake	23/12/2021	24/12/2021	0.040637	0.002961	0.000795	0.000235	0.000143	0.00222	BDL	0.002269	BDL	0.001582

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe) mg/L	Manganese (Mn) mg/L	Nickel (Ni) mg/L	Chromium (Cr) mg/L	Lead (Pb) mg/L	Copper (Cu) mg/L	Cadmium (Cd) mg/L	Arsenic (As) mg/L	Mercury (Hg) mg/L	Zinc (Zn) mg/L
Y2112216	Chandraiah drain at Polukonda Village	Drain	23/12/2021	24/12/2021	0.029157	0.003023	0.000747	0.00024	0.000198	0.00353	BDL	0.002331	BDL	0.00241
Y2112217	Budameru at Kadiravalli Village	Drain	23/12/2021	24/12/2021	0.025581	0.0022	0.000610	0.000281	0.000222	0.003937	0.000005	0.002153	BDL	0.007322
Y2112218	Kolleti kuta at Pichikalamarru Village	Lake	23/12/2021	24/12/2021	0.034308	0.001429	0.000900	0.000264	0.000159	0.002743	BDL	0.002744	BDL	0.003653
Y2112219	Cevar canal at Pichikalamarru Village	Lake	23/12/2021	24/12/2021	0.032313	0.001335	0.000785	0.000245	0.000185	0.002999	BDL	0.00269	BDL	0.005357
Y2112220	Srungavarappadu drain at Srungavarappadu	Drain	23/12/2021	24/12/2021	0.037623	0.005851	0.001008	0.000325	0.000324	0.00293	BDL	0.00269	BDL	0.003797
Y2112221	Pulugu/Nagaraju at Atapaka Village	Drain	23/12/2021	24/12/2021	0.03531	0.002445	0.000688	0.000356	0.000200	0.002961	0.000009	0.002448	BDL	0.001349
Y2112222	Lake - Bird Life Sanctuary at Atapaka Village	Lake	23/12/2021	24/12/2021	0.031669	0.003347	0.001298	0.000227	0.000200	0.003142	0.000002	0.003073	BDL	0.004182
Y2112223	Upputeru Tadimada Village	Lake	23/12/2021	24/12/2021	0.035037	0.005269	0.000798	0.000245	0.000222	0.003283	BDL	0.002679	BDL	0.005177

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SENIOR ENVIRONMENTAL SCIENTIST

ANDHRA PRADESH POLLUTION CONTROL BOARD, ZONAL LABORATORY :: VIJAYAWADA

Metal analysis report of Kolleru lake samples for the month of January - 2022

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe) mg/L	Manganese (Mn) mg/L	Nickel (Ni) mg/L	Chromium (Cr) mg/L	Lead (Pb) mg/L	Copper (Cu) mg/L	Cadmium (Cd) mg/L	Arsenic (As) mg/L	Mercury (Hg) mg/L	Zinc (Zn) mg/L
WEST GODAVARI DISTRICT (ELURU)														
Y2201057	Gudivakalanka	Lake	06/01/2022	07/01/2022	0.033014	0.012634	0.00796	BDL	BDL	0.000675	BDL	0.002033	BDL	0.013392
Y2201058	Mondikodu drain confluence with Kolleru lake at Mondikodu Gram Pachayat of Gudivakalanka Village	Drain	06/01/2022	07/01/2022	0.036136	0.031122	0.00129	0.000239	BDL	0.001781	BDL	0.009499	BDL	0.013995
Y2201059	Kokkirayalanka	Lake	06/01/2022	07/01/2022	0.029227	0.012285	0.000577	BDL	BDL	0.000489	BDL	0.003755	BDL	0.00829
Y2201060	Jodi Kaluva	Drain	06/01/2022	07/01/2022	0.0259	0.00908	0.00052	BDL	BDL	0.00037	BDL	0.00329	BDL	0.0094
Y2201061	Chettunnapadu	Lake	06/01/2022	07/01/2022	0.02555	0.01111	0.00059	BDL	BDL	0.00067	BDL	0.002	BDL	0.01246
Y2201062	Pandikodu drain	Drain	06/01/2022	07/01/2022	0.0222	0.01024	0.0004	BDL	BDL	0.00096	BDL	0.00080	BDL	0.01354
Y2201063	Tokalapalli drain	Drain	06/01/2022	07/01/2022	0.02879	0.01268	0.00039	BDL	BDL	0.00083	BDL	0.00071	BDL	0.01341
Y2201064	Bulusuvagu	Drain	06/01/2022	07/01/2022	0.048835	0.010359	0.000889	0.000029	BDL	0.000443	BDL	0.000924	BDL	0.009598
Y2201065	Kovvali drain	Drain	06/01/2022	07/01/2022	0.019222	0.007554	0.000183	BDL	BDL	0.000572	BDL	0.000479	BDL	0.011425
Y2201066	East Tammileru	Drain	06/01/2022	07/01/2022	0.018721	0.0083	0.000337	BDL	BDL	0.000842	BDL	0.001318	BDL	0.011529
Y2201067	West Thammileru	Drain	06/01/2022	07/01/2022	0.030263	0.010655	0.000833	BDL	BDL	0.000934	BDL	0.003296	BDL	0.010316
KRISHNA DISTRICT														
Y2201021	Chandraish drain at Teacher Colony, Satyanarayana Puram, Gudivada	Drain	04/01/2022	05/01/2022	0.032215	0.031529	0.00412	0.00606	0.0014	0.003865	BDL	0.02047	0.000785	0.004776
Y2201022	Budameru drain, Machilipatnam-Nuzid, Kalluru Road No.28, Near Puttagunta Village	Drain	04/01/2022	05/01/2022	0.046475	0.065778	0.000707	0.000598	0.0024	0.003511	BDL	0.001653	0.00599	0.007413

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Iron (Fe) mg/L	Manganese (Mn) mg/L	Nickel (Ni) mg/L	Chromium (Cr) mg/L	Lead (Pb) mg/L	Copper (Cu) mg/L	Cadmium (Cd) mg/L	Arsenic (As) mg/L	Mercury (Hg) mg/L	Zinc (Zn) mg/L
Y2201023	Narasannapalem drain at Gudivada Road, Arugolanu Village	Drain	04/01/2022	05/01/2022	0.079591	0.034258	0.001658	0.002442	0.000301	0.003942	BDL	0.003297	0.000096	0.050023
Y2201024	Pularuj drain at Kikaluru-Eluru Road	Drain	04/01/2022	05/01/2022	0.042976	0.175984	0.000422	0.00026	BDL	0.002252	BDL	0.001677	BDL	0.005617
Y2201025	Chinayedlagadi lake at Kikaluru-Eluru Road	Lake	04/01/2022	05/01/2022	0.028419	0.022821	0.000475	0.000113	BDL	0.002048	BDL	0.002826	BDL	0.004244
Y2201026	Peddaedlagadi lake at Kikaluru-Eluru Road	Lake	04/01/2022	05/01/2022	0.29944	0.04801	0.00146	0.00433	0.00021	0.00325	BDL	0.00221	BDL	0.00773
Y2201027	Chandraiah drain at Polukonda Village	Drain	04/01/2022	05/01/2022	0.0571	0.01336	0.00056	0.00104	0.00016	0.00313	BDL	0.00172	BDL	0.00414
Y2201028	Budameru at Kudaravalli Village	Drain	04/01/2022	05/01/2022	0.42852	0.04788	0.00186	0.00611	0.00029	0.00411	0.00001	0.00288	BDL	0.01073
Y2201029	Kolleti kota at Pichikalamarru Village	Lake	04/01/2022	05/01/2022	0.54584	0.1247	0.00117	0.00722	0.00035	0.00341	0.000004	0.00465	BDL	0.00692
Y2201030	Circar canal at Pichikalamarru Village	Lake	04/01/2022	05/01/2022	1.41106	0.07032	0.00156	0.00135	0.00024	0.00318	0.00115	0.00165	BDL	0.12358
Y2201031	Srungavarappadu drain at Srungavarappadu	Drain	04/01/2022	05/01/2022	0.13218	0.033890	0.00128	0.00177	0.00008	0.00293	0.00001	0.00296	BDL	0.04885
Y2201032	Polraju/Nagaraju) at Atapaka Village	Drain	04/01/2022	05/01/2022	0.29716	0.085765	0.00825	0.003705	0.000138	0.002722	BDL	0.003136	BDL	0.008921
Y2201033	Lake - Bird Life Sanctuary at Atapaka Village	Lake	04/01/2022	05/01/2022	0.032306	0.044509	0.000627	0.005460	0.000027	0.002568	BDL	0.008290	BDL	0.00943
Y2201034	Upputeru Tadinada Village	Lake	04/01/2022	05/01/2022	0.05337	0.01171	0.000411	0.00385	BDL	0.00128	BDL	0.002154	0.00037	0.00649

K Sreenivas 03.02.2022

SENIOR ENVIRONMENTAL SCIENTIST

ANDHRA PRADESH POLLUTION CONTROL BOARD, ZONAL LABORATORY :: VIJAYAWADA

Physico chemical analysis report of Kolleru lake samples (Physico Chemicals) for the month August - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO	TDS	COD	BOD	Nitrate -N (NO_3-N)	Phosphates (PO_4-P)	Coliform (MPN/100ml)	
												Total	Fecal
WEST GODAVARI DISTRICT (ELURU)													
Y2108070	Madavapuram	Drain	06/08/2021	07/08/2021	7.53	1.8	3468	40	5.8	2.02	0.47	460	<3
Y2108071	Gudivakalanka	Lake	06/08/2021	07/08/2021	7.72	6.0	1740	16	2.1	2.31	0.83	380	<3
Y2108072	Mondikodu Gram Pachayat	Drain	06/08/2021	07/08/2021	7.54	5.4	1722	12	1.8	2.29	0.76	440	<3
Y2108073	Kokkirayalanka	Lake	06/08/2021	07/08/2021	7.73	2.8	1900	8	1.2	2.34	1.00	240	<3
Y2108074	Jodi Kaluva	Drain	06/08/2021	07/08/2021	7.76	7.2	2432	52	7.2	2.61	1.28	470	<3
Y2108075	Chettunnapadu	Lake	06/08/2021	07/08/2021	7.36	NIL	1660	36	4.6	3.65	1.00	210	<3
Y2108076	Bulusuvagu	Drain	06/08/2021	07/08/2021	7.31	2.1	2673	32	4.1	1.61	1.16	460	<3
Y2108077	Tokalapalli drain	Drain	06/08/2021	07/08/2021	7.76	5.5	260	20	2.4	1.84	0.10	440	<3
Y2108078	Pandikodu drain	Drain	06/08/2021	07/08/2021	7.49	6.4	3054	4	0.8	1.61	0.11	380	<3
Y2108079	Bulusuvagu Panta Bodhi	Drain	06/08/2021	07/08/2021	7.58	7.2	1890	40	5.2	1.47	0.22	460	<3
Y2108080	Kovvali drain	Drain	06/08/2021	07/08/2021	7.62	6.4	350	12	1.6	0.99	0.89	440	<3
Y2108081	Mondikodu	Drain	06/08/2021	07/08/2021	7.55	5.8	554	12	1.8	1.70	0.12	470	<3
Y2108082	East Tammileru	Drain	06/08/2021	07/08/2021	7.58	7.5	530	16	2.2	1.16	0.21	380	<3
Y2108083	West Thammileru	Drain	06/08/2021	07/08/2021	7.69	5.2	482	24	2.8	1.13	0.17	460	<3
KRISHNA DISTRICT													
Y2108052	Chandraiah drain	Drain	04/08/2021	05/08/2021	7.24	3.5	550	32	3.2	1.73	0.23	150	<3
Y2108053	Budameru	Drain	04/08/2021	05/08/2021	7.12	3.5	732	8	1.4	2.36	0.64	210	<3
Y2108054	Narasannapalem	Drain	04/08/2021	05/08/2021	7.36	7.0	675	8	1.2	2.08	0.57	460	<3

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO	TDS	COD	BOD	Nitrate -N (NO_3-N)	Phosphates (PO_4-P)	Coliform (MPN/100ml)	
												Total	Fecal
Y2108055	Pedaedlagadi	Lake	04/08/2021	05/08/2021	7.90	2.7	1455	12	1.6	1.74	0.78	380	<3
Y2108056	Chinaedlagadi	Lake	04/08/2021	05/08/2021	8.25	8.2	2400	46	9.0	1.77	1.16	210	<3
Y2108057	Polaraj drain	Drain	04/08/2021	05/08/2021	7.99	4.5	2710	36	5.0	2.52	0.94	240	<3
Y2108058	Kolleti kota	Lake	04/08/2021	05/08/2021	8.07	4.8	1660	28	2.7	1.62	0.82	210	<3
Y2108059	Circar canal	Lake	04/08/2021	05/08/2021	8.02	4.5	1587	16	2.2	1.57	0.87	460	<3
Y2108060	Srungavarappadu	Lake	04/08/2021	05/08/2021	7.98	5.1	1781	4	0.8	1.59	0.85	240	<3
Y2108061	Upputeru	Lake	04/08/2021	05/08/2021	7.92	4.1	1692	44	5.8	1.99	0.84	39	<3

Note: All results are expressed in mg/L except pH.

ANALYST **JSO** **SENIOR ENVIRONMENTAL SCIENTIST**

ANDHRA PRADESH POLLUTION CONTROL BOARD, ZONAL LABORATORY :: VIJAYAWADA

Physico chemical analysis report of Kolleru lake samples (Physico Chemicals) for the month August - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	Electrical Conductivity	TSS	TDS	DO	COD	BOD	Nitrate -N (NO_3-N)	Phosphates (PO_4-P)	Free Ammonia	Coliform (MPN/100ml)	
															Total	Fecal
KRISHNA DISTRICT																
Y2108185	Sample collected from Upputeru at Tadimada Village	Lake	25/08/2021	26/08/2021	6.96	1935.00	13	1220	3.1	28	5.4	1.66	0.83	0.03	20	<3
Y2108186	Sample collected from Kolleruikota at Pachikalamarru Village	Lake	25/08/2021	26/08/2021	7.33	1815	8	1080	3.7	26	5.2	1.49	0.93	BDL	28	<3
Y2108187	Sample collected from drain (Polraju/Nagaraju) at Atapaka Village	Drain	25/08/2021	26/08/2021	7.29	2440	45	1580	4.5	29	5.4	1.89	0.98	BDL	15	<3
Y2108188	Sample collected from in the Lake - Bird Life Sanctuary at Atapaka Village	Lake	25/08/2021	26/08/2021	8.45	3300	49	2180	7.8	41	6.4	1.93	0.31	0.18	23	<3
Y2108189	Sample collected from in the Polraju drain at Kikaluru - Eluru Road	Drain	25/08/2021	26/08/2021	8.09	2340	25	1520	6.3	30	5.3	1.89	0.80	0.04	28	<3
Y2108190	Sample collected from in the Chinayedlagadi Lake at Kikaluru - Eluru Road	Lake	25/08/2021	26/08/2021	8.35	3270	18	2180	8	35	5.8	1.77	1.32	BDL	20	<3
Y2108191	Sample collected from in the Peddaedlagadi Lake at Kikaluru - Eluru Road	Lake	25/08/2021	26/08/2021	7.52	1471	9	940	0.6	26	4.2	1.59	0.62	0.11	15	<3
Y2108192	Sample collected from in the Chandraiah drain at Polukonda Village	Drain	25/08/2021	26/08/2021	7.62	1229	19	700	6.0	27	4.6	1.92	0.72	0.09	23	<3

Note: All results are expressed in mg/L except pH.

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Physico chemical analysis report of Kolleru lake samples (Physico Chemicals) for the month September - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO	TDS	COD	TOC	BOD	Nitrate -N (NO_3-N)	Phosphates (PO_4-P)	Coliform (MPN/100ml)	
													Total	Fecal
WEST GODAVARI DISTRICT (ELURU)														
Y2109110	Gudivakalanka	Lake	16/09/2021	17/09/2021	7.14	6.6	3880	40	12.02	3.0	1.46	0.29	93	<3
Y2109111	Mondikodu drain confluence with Kolleru lake at Mondikodu Gram Pachayat of Gudivakalanka Village	Drain	16/09/2021	17/09/2021	7.24	7.0	2639	30	10.66	3.2	1.64	0.13	28	<3
Y2109112	Kokkirayalanka	Lake	16/09/2021	17/09/2021	7.50	2.9	1707	20	5.42	2.1	1.32	0.37	15	<3
Y2109113	Jodi Kaluva	Drain	16/09/2021	17/09/2021	7.32	4.8	1024	32	11.14	3.5	1.75	1.01	28	<3
Y2109114	Chettunnapadu	Lake	16/09/2021	17/09/2021	7.37	7.7	1087	45	15.25	6.6	2.18	0.36	20	<3
Y2109115	Pandikodu drain	Drain	16/09/2021	17/09/2021	7.34	4.9	1491	34	11.08	4.9	1.71	0.33	21	<3
Y2109116	Tokalapalli drain	Drain	16/09/2021	17/09/2021	7.40	5.2	549	20	5.31	2.2	1.55	0.12	7	<3
Y2109117	Bulusuvagu	Drain	16/09/2021	17/09/2021	7.44	2.4	1396	24	6.00	2.0	1.82	0.18	11	<3
Y2109153	Kovvali drain	Drain	17/09/2021	18/09/2021	7.12	7.4	643	36	8.82	4.5	2.47	0.08	28	<3
Y2109154	East Tammileru	Drain	17/09/2021	18/09/2021	7.30	8.4	368	28	6.73	4.7	1.15	0.05	20	<3
Y2109155	West Thammileru	Drain	17/09/2021	18/09/2021	7.39	6.3	472	32	7.72	2.2	1.40	0.09	28	<3

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO	TDS	COD	TOC	BOD	Nitrate -N (NO_3-N)	Phosphates (PO_4-P)	Coliform (MPN/100ml)	
													Total	Fecal
KRISHNA DISTRICT														
	Chandraiah drain	Drain	**Not Submitted**											
	Budameru	Drain												
	Narasannapalem	Drain												
	Pedaedlagadi	Lake												
	Chinaedlagadi	Lake												
	Polaraj drain	Drain												
	Kolleti kota	Lake												
	Circar canal	Lake												
	Srungavarappadu	Lake												
	Upputeru	Lake												

Note: All results are expressed in mg/L except pH.

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Physico chemical analysis report of Kolleru lake samples for the month of October - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO (mg/L)	TDS (mg/L)	COD (mg/L)	TOC (mg/L)	BOD (mg/L)	Nitrate -N (NO_3-N) (mg/L)	Phosphates (PO_4-P) (mg/L)	Coliform (MPN/100ml)	
													Total	Fecal
WEST GODAVARI DISTRICT (ELURU)														
Y2110209	Gudimalanka	Lake	23/10/2021	23/10/2021	6.82	3.7	650	36	16.2	3.2	1.15	0.31	93	<3
Y2110210	Mendikodu drain confluence with Kolleru lake at Mendikodu Gram Pachayat of Gudimalanka Village	Drain	23/10/2021	23/10/2021	7.03	6.0	756	28	13.6	2.6	1.54	0.51	15	<3
Y2110211	Kokkiregalanka	Lake	23/10/2021	23/10/2021	7.04	2.6	629	20	13.2	2.2	1.13	0.33	20	<3
Y2110212	Jodi Kaluva	Drain	23/10/2021	23/10/2021	7.05	4.9	945	30	14.9	2.8	1.65	1.74	28	<3
Y2110213	Chetmanagadu	Lake	23/10/2021	23/10/2021	7.02	7.5	910	40	11.7	5.4	1.18	0.35	20	<3
Y2110214	Pandikodu drain	Drain	23/10/2021	23/10/2021	7.03	4.8	934	36	12.5	4.2	1.45	0.54	21	<3
Y2110215	Tokalapalli drain	Drain	23/10/2021	23/10/2021	7.07	5.4	406	24	10.0	2.2	1.55	0.41	11	<3
Y2110216	Bulusuvagu	Drain	23/10/2021	23/10/2021	7.18	2.6	1102	20	13.6	2.4	1.63	0.64	28	<3
Y2110217	Eovali drain	Drain	23/10/2021	23/10/2021	7.30	6.5	620	32	12.4	3.9	1.18	0.39	15	<3
Y2110218	East Tammileru	Drain	23/10/2021	23/10/2021	7.40	5.5	543	24	9.8	2.8	1.12	0.70	20	<3
Y2110219	West Thammileru	Drain	23/10/2021	23/10/2021	7.42	6.0	538	30	17.0	3.6	1.62	0.29	28	<3

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO (mg/L)	TDS (mg/L)	COD (mg/L)	TOC (mg/L)	BOD (mg/L)	Nitrate -N (NO_3-N) (mg/L)	Phosphates (PO_4-P) (mg/L)	Coliform (MPN/100ml)	
													Total	Fecal
KRISHNA DISTRICT														
Y2110070	Chandraiah drain at Teacher Colony, Satyanarayana Puram, Gudivada	Drain	11/10/2021	11/10/2021	7.01	4.0	547	20	5.97	2.4	1.64	0.22	21	<3
Y2110071	Budameru drain, Machilipatnam-Nuzid, Kaluru Road No.28, Near Puttagunta Village	Drain	11/10/2021	11/10/2021	6.93	3.0	607	16	10.6	1.8	2.84	0.40	28	<3
Y2110072	Narasannapalem drain at Gudivada Road, Avagadam Village	Drain	11/10/2021	11/10/2021	7.74	7.3	589	28	9.4	2.9	2.49	0.75	15	<3
Y2110073	Polaraj drain at Kikuluru-Eluru Road	Drain	11/10/2021	11/10/2021	7.45	5.0	1549	40	13.0	4.0	2.06	0.91	7	<3
Y2110074	Chinayedlagadi lake at Kikuluru-Eluru Road	Lake	11/10/2021	11/10/2021	7.78	8.4	723	44	9.7	4.2	1.76	1.04	11	<3
Y2110075	Peddayedlagadi lake at Kikuluru-Eluru Road	Lake	11/10/2021	11/10/2021	7.90	2.3	718	20	12.5	2.2	1.29	0.38	28	<3
Y2110076	Chandraiah drain at Polukonda Village	Drain	11/10/2021	11/10/2021	7.84	3.7	1016	36	14.4	3.8	1.33	0.53	20	<3
Y2110077	Budameru at Kudavalli Village	Drain	11/10/2021	11/10/2021	7.80	4.5	1050	20	10.0	2.1	1.39	0.67	28	<3
Y2110078	Kolleti lake at Pichikadamarru Village	Lake	11/10/2021	11/10/2021	7.86	3.4	899	24	10.6	2.6	1.33	0.46	20	<3
Y2110079	Circar canal at Pichikadamarru Village	Lake	11/10/2021	11/10/2021	7.95	4.0	809	28	11.4	3.0	1.31	0.65	11	<3
Y2110080	Srungavarappadu drain at Srungavarappadu	Drain	11/10/2021	11/10/2021	7.86	4.7	1427	32	13.1	3.1	1.16	0.77	15	<3
Y2110081	Polraju/Naganjuj at Atapaka Village	Drain	11/10/2021	11/10/2021	7.88	6.2	1525	36	16.0	3.7	2.15	0.39	39	<3
Y2110082	Lake - Bird Life Sanctuary at Atapaka Village	Lake	11/10/2021	11/10/2021	7.65	4.7	530	28	10.9	3.0	1.80	0.14	28	<3
Y2110083	Upputeru Tadimada Village	Lake	11/10/2021	11/10/2021	7.67	3.8	820	40	10.4	3.8	2.37	0.60	15	<3

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Physico Chemical analysis report of Kolleru lake samples for the month of November - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO (mg/L)	TDS (mg/L)	COD (mg/L)	TOC (mg/L)	BOD (mg/L)	Nitrate -N (NO_3-N) (mg/L)	Phosphates (PO_4-P) (mg/L)	Coliform (MPN/100ml)	
													Total	Fecal
WEST GODAVARI DISTRICT (ELURU)														
Y2111114	Gudivadalanka	Lake	17/11/2021	18/11/2021	6.90	7.1	745	32	17.4	3.0	1.83	0.30	93	<3
Y2111115	Mondikodu drain confluence with Kalleru lake at Mondikodu Gram Pachayat of Gudivadalanka Village	Drain	17/11/2021	18/11/2021	7.06	4.9	763	20	12.2	2.0	1.74	0.29	20	<3
Y2111116	Kokkirayalanka	Lake	17/11/2021	18/11/2021	7.18	6.1	962	24	14.2	2.4	1.69	0.70	15	<3
Y2111117	Jodi Kaluva	Drain	17/11/2021	18/11/2021	7.23	6.1	739	28	15.2	2.6	1.51	1.71	28	<3
Y2111118	Chettunnapadu	Lake	17/11/2021	18/11/2021	7.60	5.7	725	36	11.84	4.0	1.53	0.79	21	<3
Y2111119	Pandikodu drain	Drain	17/11/2021	18/11/2021	7.20	1.5	424	20	12.50	2.2	1.20	0.80	11	<3
Y2111120	Tokalapalli drain	Drain	17/11/2021	18/11/2021	7.63	5.1	382	16	15.2	2.0	1.25	0.25	15	<3
Y2111121	Bulusuvagu	Drain	17/11/2021	18/11/2021	7.50	6.1	618	20	14.8	2.1	1.29	0.22	20	<3
Y2111122	Kovvali drain	Drain	17/11/2021	18/11/2021	7.76	6.0	386	32	14.0	4.0	1.22	0.22	28	<3
Y2111123	East Tammileru	Drain	17/11/2021	18/11/2021	7.43	8.0	610	28	16.7	2.4	1.53	0.20	21	<3
Y2111124	West Thammileru	Drain	17/11/2021	18/11/2021	7.47	6.9	632	32	18.2	3.2	2.90	0.69	15	<3

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO (mg/L)	TDS (mg/L)	COD (mg/L)	TOC (mg/L)	BOD (mg/L)	Nitrate -N (NO_3-N) (mg/L)	Phosphates (PO_4-P) (mg/L)	Coliform (MPN/100ml)	
													Total	Fecal
KRISHNA DISTRICT														
Y2111055	Chandraiah drain at Teacher Colony, Satyanarayana Puram, Gudivada	Drain	11/11/2021	12/11/2021	6.58	6.8	585	16	6.09	2.7	1.69	1.82	15	<3
Y2111056	Budameru drain, Machilipatnam-Nuzid, Kalluru Road No.28, Near Pattaguntа Village	Drain	11/11/2021	12/11/2021	7.19	3.4	663	20	17.27	2.0	3.17	1.00	21	<3
Y2111057	Narasannapalem drain at Gudivada Road, Arugolanu Village	Drain	11/11/2021	12/11/2021	7.50	3.7	553	24	9.4	2.8	2.37	0.37	28	<3
Y2111086	Polang drain at Kikuluru-Eluru Road	Drain	16/11/2021	16/11/2021	7.52	6.7	582	28	12.5	2.3	2.25	1.13	11	<3
Y2111087	Chinayerillagadi lake at Kikuluru-Eluru Road	Lake	16/11/2021	16/11/2021	7.44	8.1	1774	40	10.8	3.4	1.79	1.05	7	<3
Y2111088	Peddaerillagadi lake at Kikuluru-Eluru Road	Lake	16/11/2021	16/11/2021	7.56	4.8	1264	24	12.4	2.9	2.21	1.12	20	<3
Y2111058	Chandraiah drain at Polukonda Village	Drain	11/11/2021	12/11/2021	7.64	4.0	582	32	14.0	3.2	2.78	0.40	15	<3
Y2111059	Budameru at Rudravalli Village	Drain	11/11/2021	12/11/2021	7.82	6.1	1438	20	10.2	2.8	2.13	1.11	39	<3
Y2110060	Kolleti kota at Pichikalamarru Village	Lake	11/11/2021	12/11/2021	7.84	3.1	1004	24	10.6	2.2	1.60	1.00	28	<3
Y2110061	Circar canal at Pichikalamarru Village	Lake	11/11/2021	12/11/2021	7.94	3.9	1006	28	11.8	3.0	1.52	1.21	15	<3
Y2111062	Srungavarappadu drain at Srungavarappadu	Drain	11/11/2021	12/11/2021	7.82	4.1	1113	30	14.2	3.2	1.72	1.36	20	<3
Y2111089	Pairoju/Nagaraju at Atapaka Village	Drain	16/11/2021	16/11/2021	7.80	5.6	1203	32	15.0	3.5	2.12	1.60	11	<3
Y2111090	Lake - Bird Life Sanctuary at Atapaka Village	Lake	16/11/2021	16/11/2021	7.86	8.5	1530	24	10.4	2.8	2.17	0.5	21	<3
Y2111063	Upputeru Tadinada Village	Lake	11/11/2021	12/11/2021	7.90	3.4	1064	28	9.8	2.4	1.74	0.91	15	<3

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Physico Chemical analysis report of Kolleru lake samples for the month of December - 2021

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO (mg/L)	TDS (mg/L)	COD (mg/L)	BOD (mg/L)	Nitrate-N (NO_3-N) (mg/L)	Phosphates (PO_4-P) (mg/L)	Coliform (MPN/100ml)	
												Total	Fecal
WEST GODAVARI DISTRICT (ELURU)													
Y2112088	Gudivakalanka	Lake	13/12/2021	14/12/2021	7.52	6.2	780	28	2.5	1.49	0.09	15	<3
Y2112089	Mondikodu drain confluence with Kolleru lake at Mondikodu Gram Panchayat of Gudivakalanka Village	Drain	13/12/2021	14/12/2021	7.39	5.0	1208	32	3.9	1.45	0.11	21	<3
Y2112090	Kokinayalanka	Lake	13/12/2021	14/12/2021	7.51	5.8	1266	20	2.0	1.54	0.38	28	<3
Y2112091	Jodi Kaluva	Drain	13/12/2021	14/12/2021	7.46	5.6	1382	24	2.2	2.06	0.96	15	<3
Y2112092	Chatrumoparu	Lake	13/12/2021	14/12/2021	7.75	6.0	1288	36	3.4	2.10	0.98	11	<3
Y2112093	Pandikodu drain	Drain	13/12/2021	14/12/2021	7.66	5.2	350	16	2.2	0.83	0.03	20	<3
Y2112094	Tokalapalli drain	Drain	13/12/2021	14/12/2021	7.43	5.0	359	10	2.0	1.01	0.03	39	<3
Y2112095	Bulusuvagu	Drain	13/12/2021	14/12/2021	7.58	5.5	768	20	2.4	1.65	0.21	15	<3
Y2112096	Koruvili drain	Drain	13/12/2021	14/12/2021	7.96	5.9	612	24	2.6	1.99	0.46	20	<3
Y2112097	East Tamarileru	Drain	13/12/2021	14/12/2021	7.75	5.6	789	30	3.2	1.78	0.26	28	<3
Y2112098	West Thammileru	Drain	13/12/2021	14/12/2021	7.84	5.7	642	16	1.8	1.28	0.03	15	<3
KRISHNA DISTRICT													
Y2112210	Chandraiah drain at Teacher Colony, Satyanarayana Puram, Gudivada	Drain	23/12.2021	24/12/2021	7.79	6.2	493	12	0.8	1.72	0.27	21	<3
Y2112211	Badameru drain, Machilipatnam-Nuzid, Kaikalu Road No.20, Near Pulligunta Village	Drain	23/12.2021	24/12/2021	7.75	5.6	785	2.0	2.0	1.28	0.52	15	<3
Y2112212	Narasannapalem drain at Gudivada Road, Anajaneru Village	Drain	23/12.2021	24/12/2021	7.28	5.8	688	24	2.2	2.0	0.92	28	<3

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO (mg/L)	TDS (mg/L)	COD (mg/L)	BOD (mg/L)	Nitrate -N (NO_3-N) (mg/L)	Phosphates (PO_4-P) (mg/L)	Coliform (MPN/100ml)	
												Total	Fecal
Y2112213	Polaraj drain at Kaikaluru-Eluru Road	Drain	23/12.2021	24/12/2021	7.99	6.3	1520	32	3.0	2.16	0.83	39	<3
Y2112214	Chinayedlagadi lake at Kaikaluru-Eluru Road	Lake	23/12.2021	24/12/2021	7.22	6.0	1704	30	3.2	2.13	0.84	11	<3
Y2112215	Peddayedlagadi lake at Kaikaluru-Eluru Road	Lake	23/12.2021	24/12/2021	7.77	6.1	1810	36	3.4	2.39	0.64	28	<3
Y2112216	Chandraiah drain at Polukonda Village	Drain	23/12.2021	24/12/2021	7.92	6.9	1003	28	2.4	2.07	0.39	11	<3
Y2112217	Budameru at Kadavakolli Village	Drain	23/12.2021	24/12/2021	7.81	5.2	824	16	2.0	1.91	0.20	26	<3
Y2112218	Kolleti kota at Rishikalamarru Village	Lake	23/12.2021	24/12/2021	7.83	5.6	1204	20	2.0	1.77	0.81	21	<3
Y2112219	Circar canal at Pichikalamarru Village	Lake	23/12.2021	24/12/2021	7.94	5.2	1294	24	2.2	1.73	0.68	16	<3
Y2112220	Srungavarappadu drain at Srungavarappadu	Drain	23/12.2021	24/12/2021	7.89	5.0	1200	16	1.8	1.82	0.62	20	<3
Y2112221	Polraju/Nagaraju at Atapaka Village	Drain	23/12.2021	24/12/2021	7.72	6.0	1304	30	3.2	2.49	0.96	39	<3
Y2112222	Lake - Bird Life Sanctuary at Atapaka Village	Lake	23/12.2021	24/12/2021	7.85	7.0	1656	28	2.4	2.31	0.15	16	<3
Y2112223	Uppuleru Tadinada Village	Lake	23/12.2021	24/12/2021	7.21	6.0	1662	32	3.4	2.10	1.0	11	<3

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Physico Chemical analysis report of Kolleru lake samples for the month of January - 2022

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO (mg/L)	TDS (mg/L)	COD (mg/L)	BOD (mg/L)	Nitrate-N (NO_3-N) (mg/L)	Phosphates (PO_4-P) (mg/L)	Coliform (MPN/100ml)	
												Total	Fecal
WEST GODAVARI DISTRICT (ELURU)													
Y2201057	Gudivakalanka	Lake	06/01/2022	07/01/2022	7.85	6.0	1582	64	9.8	0.88	0.12	120	<3
Y2201058	Mondikodu drain confluence with Kolleru lake at Mondikodu Gram Pachayat of Gudivakalanka Village	Drain	06/01/2022	07/01/2022	7.40	5.7	1155	68	10.0	0.67	0.02	230	1
Y2201059	Kokkireyalanka	Lake	06/01/2022	07/01/2022	7.48	5.2	2724	104	14.6	2.74	0.20	240	<3
Y2201060	Jodi Kaluva	Drain	06/01/2022	07/01/2022	7.64	5.4	1936	60	8.8	0.98	0.70	93	3
Y2201061	Chettunnapadu	Lake	06/01/2022	07/01/2022	7.66	5.7	1259	52	8.0	0.86	0.24	120	<3
Y2201062	Pandikodu drain	Drain	06/01/2022	07/01/2022	7.21	5.6	384	56	8.2	0.41	0.04	210	3
Y2201063	Tokalapelli drain	Drain	06/01/2022	07/01/2022	7.23	5.7	1302	84	12.0	0.44	0.05	240	3
Y2201064	Buluswagu	Drain	06/01/2022	07/01/2022	7.64	5.6	2638	104	15.0	1.19	0.02	120	2
Y2201065	Kovveli drain	Drain	06/01/2022	07/01/2022	7.32	5.2	912	68	9.6	0.36	0.02	210	2
Y2201066	East Tammileru	Drain	06/01/2022	07/01/2022	7.17	5.4	476	60	9.2	0.42	0.05	93	1
Y2201067	West Thammileru	Drain	06/01/2022	07/01/2022	7.64	5.3	1008	88	12.0	6.32	0.80	120	1
KRISHNA DISTRICT													
Y2201021	Chandraiah drain at Teacher Colony, Satyanarayana Puram, Gudivada	Drain	04/01/2022	05/01/2022	8.19	5.5	485	20	4.0	0.80	0.30	240	3
Y2201022	Budameru drain, Machilipatnam-Nuzid, Kaikaru Road No.28, Near Puttagunta Village	Drain	04/01/2022	05/01/2022	7.18	5.6	853	56	8.6	6.70	0.48	210	1

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Sample code	Sample Particulars	From	Date of Collection	Date of Submission	pH	DO (mg/L)	TDS (mg/L)	COD (mg/L)	BOD (mg/L)	Nitrate -N (NO_3-N) (mg/L)	Phosphates (PO_4-P) (mg/L)	Coliform (MPN/100ml)	
												Total	Fecal
Y2201023	Narasannapalem drain at Gudivada Road, Angalanu Village	Drain	04/01/2022	05/01/2022	7.17	6.5	673	60	9.2	1.03	0.89	150	<3
Y2201024	Polaraj drain at Kilaluru-Eluru Road	Drain	04/01/2022	05/01/2022	7.85	6.0	2305	36	5.4	0.89	0.53	210	1
	Chinayedlagadi lake at Kilaluru-Eluru Road	Lake	04/01/2022	05/01/2022	7.07	5.7	3073	156	20.2	3.10	0.63	230	1
Y2201026	Peddaedlagadi lake at Kilaluru-Eluru Road	Lake	04/01/2022	05/01/2022	7.27	6.3	2422	88	13.0	1.03	0.41	75	<3
Y2201027	Chandralah drain at Polukonda Village	Drain	04/01/2022	05/01/2022	7.37	5.2	608	64	9.4	0.89	0.58	120	1
Y2201028	Buckaneru at Kudaravalli Village	Drain	04/01/2022	05/01/2022	7.56	5.4	548	68	9.8	1.07	0.18	150	1
Y2201029	Kolleti leta at Pichikalamarru Village	Lake	04/01/2022	05/01/2022	7.16	5.6	2063	100	14.0	0.74	0.55	93	1
Y2201030	Circar canal at Pichikalamarru Village	Lake	04/01/2022	05/01/2022	7.19	5.5	2080	80	12.6	0.65	0.76	75	1
Y2201031	Srungavarappadu drain at Srungavarappadu	Drain	04/01/2022	05/01/2022	7.10	5.3	2070	92	13.4	0.81	0.73	240	<3
Y2201032	Polraju/Nagaraju) at Atapaka Village	Drain	04/01/2022	05/01/2022	7.18	6.2	2265	108	14.8	1.55	0.76	210	1
Y2201033	Lake - Bird Life Sanctuary at Atapaka Village	Lake	04/01/2022	05/01/2022	7.01	6.8	1890	84	11.6	1.22	0.13	380	3
Y2201034	Uppuleru Tadimada Village	Lake	04/01/2022	05/01/2022	7.71	5.2	1860	76	10.4	0.74	0.54	210	<3

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ANDHRA PRADESH POLLUTION CONTROL BOARD, ZONAL LABORATORY :: VIJAYAWADA

Metals Analysis reports of Kolleru lake Sludge samples for the month January - 2022

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Chromium (Cr) mg/kg	Mangenese (Mn) mg/kg	Iron (Fe) mg/kg	Nickel (Ni) mg/kg	Copper (Cu) mg/kg	Zinc (Zn) mg/kg	Arsenic (As) mg/kg	Cadmium (Cd) mg/kg	Lead (Pb) mg/kg	Mercury (Hg) mg/kg
KRISHNA DISTRICT														
Y2201SL001	Chandraiah drain at Teacher Colony, Satyanarayana Puram, Gudivada	Drain	04.01.2022	05.01.2022	0.0216	0.742	2.5937	0.291	0.1302	0.9732	0.1293	BDL	0.0203	BDL
Y2201SL002	Budameru drain, Machilipatnam-Nuzid, Kalluru Road No.28, Near Puttagunta Village	Drain	04.01.2022	05.01.2022	0.0157	1.0955	2.4173	0.0046	0.0974	1.1188	0.1483	BDL	0.0124	0.0209
Y2201SL003	Narasannapalem drain at Gudivada Road, Arugulanu Village	Drain	04.01.2022	05.01.2022	0.2321	1.2491	2.7978	0.0014	0.1395	1.3047	0.1491	BDL	0.0275	0.013
Y2201SL004	Polaraj drain at Kikaluru-Eluru Road	Drain	04.01.2022	05.01.2022	0.0278	1.0032	3.1898	0.0241	0.222	1.1555	0.1965	BDL	0.0188	BDL
Y2201SL005	Chinayedlagadi lake at Kikaluru-Eluru Road	Lake	04.01.2022	05.01.2022	0.0230	0.0797	4.528	0.073	0.0187	1.090	0.0212	BDL	0.014	0.058
Y2201SL006	Peddaedlagadi lake at Kikaluru-Eluru Road	Lake	04.01.2022	05.01.2022	0.035	0.755	2.805	BDL	0.137	0.878	0.141	BDL	0.005	0.007
Y2201SL007	Chandraiah drain at Polukonda Village	Drain	04.01.2022	05.01.2022	0.031	0.949	5.619	0.025	0.328	0.951	0.202	BDL	0.009	BDL
Y2201SL008	Budameru at Kudaravalli Village	Drain	04.01.2022	05.01.2022	0.030	0.398	2.014	BDL	0.168	0.807	0.146	BDL	0.006	BDL
Y2201SL009	Kolleti kota at Pichikalamarru Village	Lake	04.01.2022	05.01.2022	0.0128	0.46048	3.6811	BDL	0.0582	0.8411	0.1245	BDL	0.0019	BDL
Y2201SL010	Circar canal at Pichikalamarru Village	Lake	04.01.2022	05.01.2022	0.052	0.4683	1.3091	BDL	0.0986	0.8336	0.2136	BDL	BDL	BDL
Y2201SL011	Srungavarappadu drain at Srungavarappadu	Drain	04.01.2022	05.01.2022	0.116	0.5743	1.7803	BDL	0.0868	0.8293	0.2336	BDL	0.0035	BDL
Y2201SL012	Polraju/Nagaraju) at Atapaka Village	Drain	04.01.2022	05.01.2022	0.0828	0.6915	2.2652	0.0133	0.1717	1.6088	0.3413	BDL	0.0061	BDL
Y2201SL013	Lake - Bird Life Sanctuary at Atapaka Village	Lake	04.01.2022	05.01.2022	0.0036	1.0338	2.4701	0.0124	0.208	1.1089	0.2222	BDL	0.0087	BDL
Y2201SL014	Upputeru Tadinada Village	Lake	04.01.2022	05.01.2022	0.1641	0.5098	1.8625	BDL	0.0146	0.8915	0.0782	BDL	0.0091	BDL

Sample code	Sample Particulars	From	Date of Collection	Date of Submission	Chromium (Cr) mg/kg	Mangenese (Mn) mg/kg	Iron (Fe) mg/kg	Nickel (Ni) mg/kg	Copper (Cu) mg/kg	Zinc (Zn) mg/kg	Arsenic (As) mg/kg	Cadmium (Cd) mg/kg	Lead (Pb) mg/kg	Mercury (Hg) mg/kg
WEST GODAVARI DISTRICT (ELURU)														
Y2201SL015	Gudivakalanka	Lake	06.01.2022	07.01.2022	0.0006	2.7611	2.9517	0.0603	0.0981	0.8609	0.0969	BDL	0.0112	0.0103
Y2201SL016	Mondikodu drain confluence with Kolleru lake at Mondikodu Gram Pachayat of Gudivakalanka Village	Drain	06.01.2022	07.01.2022	0.0441	1.2027	3.9391	BDL	0.1158	1.1244	0.1466	BDL	0.0059	0.0788
Y2201SL017	Kokkirayalanka	Lake	06.01.2022	07.01.2022	0.0183	1.193	4.7727	0.0253	0.1058	0.9933	0.1929	BDL	0.004	BDL
Y2201SL018	Jodi Kaluva	Drain	06.01.2022	07.01.2022	0.0636	0.9872	4.1815	0.0108	0.0725	0.9178	0.1282	BDL	0.0036	BDL
Y2201SL019	Chettunnapadu	Lake	06.01.2022	07.01.2022	0.022	1.7844	0.2949	0.0485	0.209	1.0387	0.1619	BDL	0.0133	0.574
Y2201SL020	Pundikodu drain	Drain	06.01.2022	07.01.2022	BDL	1.0509	4.595	0.0232	0.1238	0.08359	0.1243	BDL	0.0323	BDL
Y2201SL021	Tokalapalli drain	Drain	06.01.2022	07.01.2022	BDL	0.7653	3.2335	BDL	0.0741	0.9089	0.1044	BDL	0.065	BDL
Y2201SL022	Buhusuvagu	Drain	06.01.2022	07.01.2022	BDL	1.0265	3.4356	0.0004	0.0721	0.8422	0.116	BDL	0.331	BDL
Y2201SL023	Kovvali drain	Drain	06.01.2022	07.01.2022	BDL	1.1474	4.6689	0.0244	0.1362	0.8446	0.1559	BDL	0.0345	0.0050
Y2201SL024	East Tammileru	Drain	06.01.2022	07.01.2022	BDL	0.5508	3.3346	BDL	0.0584	0.7293	0.1148	BDL	0.0236	BDL
Y2201SL025	West Thammileru	Drain	06.01.2022	07.01.2022	BDL	0.5803	2.8958	BDL	0.0548	0.008	0.0946	BDL	0.0302	BDL

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SENIOR ENVIROMENTAL SCIENTIST

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Tel No: 0866-2546218

Dt. 08.02.2022

Kolleru Lake Samples Pesticide analysis report Description for the month of August-2021.

	Sample Code	Sample Particulars	From
KRISHNA DISTRICT	**Y2108052**	Chandraiah drain	Drain
	Y2108053	Budameru	Drain
	Y2108054	Narasannapalem	Drain
	Y2108055	Pedaedlagadi	Lake
	Y2108056	Chinaedlagadi	Lake
	Y2108057	Polaraj drain	Drain
	Y2108058	Kolleti kota	Lake
	Y2108059	Circar canal	Lake
	Y2108060	Srungavarappadu	Lake
	Y2108061	Upputeru	Lake

ANDHRA PRADESH POLLUTION CONTROL BOARD
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Tel No: 0866-2546218

	Sample Code	Sample Particulars	From
WEST GODAVARI DISTRICT (ELURU)	**Y2108070**	Madavapuram	Drain
	Y2108071	Gudivakalanka	Lake
	Y2108072	Mondikodu Gram Pachayat	Drain
	Y2108073	Kokkirayalanka	Lake
	Y2108074	Jodi Kaluva	Drain
	Y2108075	Chettunnapadu	Lake
	Y2108076	Bulusuvagu	Drain
	Y2108077	Tokalapalli drain	Drain
	Y2108078	Pandikodu drain	Drain
	Y2108079	Bulusuvagu Panta Bodhi	Drain
	Y2108080	Kovvali drain	Drain
	Y2108081	Mondikodu	Drain
	Y2108082	East Tammileru	Drain
	Y2108083	West Thammileru	Drain

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	Sample Code	Sample Particulars	From
KRISHNA DISTRICT	**Y2108185**	Sample collected from Upputeru at Tadinada Village	Lake
	Y2108186	Sample collected from Kolletikota at Pachikalamarru Village	Lake
	Y2108187	Sample collected from drain (Polraju/Nagaraju) at Atapaka Village	Drain
	Y2108188	Sample collected from in the Lake - Bird Life Sanctuary at Atapaka Village	Lake
	Y2108189	Sample collected from in the Polraju drain at Kikaluru - Eluru Road	Drain
	Y2108190	Sample collected from in the Chinayedlagadi Lake at Kikaluru - Eluru Road	Lake
	Y2108191	Sample collected from in the Peddaedlagadi Lake at Kikaluru - Eluru Road	Lake
	Y2108192	Sample collected from in the Chandraiah drain at Polukonda Village	Drain

A.P. POLLUTION CONTROL BOARD, ZONAL LABORATORY, VISAKHAPATNAM

Sample No. Y2108052 to Y2108061, Y2108070 to Y2108075
Sample received on: 04.09.2021

S. No.	Parameter	Y2108052	Y2108053	Y2108054	Y2108055	Y2108056	Y2108057	Y2108058	Y2108059	Y2108060	Y2108061	Y2108070	Y2108071	Y2108072	Y2108073	Y2108074	Y2108075
1	Alpha – BHC	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	Beta– BHC	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
3	Gamma – BHC	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
4	4,4' – DDD	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
5	4,4' – DDE	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
6	4,4' – DDT	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
7	Aldrin	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
8	Dieldrin	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
9	Endosulfan – I	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
10	Endosulfan Sulfate	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
11	Endrin	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
12	Heptachlor	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
13	Heptachlorapoxide	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
14	Methoxychlor	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Endosulfan – II	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Delta – BHC	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Endrin Aldehyde	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ

BLQ: Below Limit of Quantitation (0.05 mg/l)

SENIOR ENVIRONMENTAL SCIENTIST

A.P. POLLUTION CONTROL BOARD, ZONAL LABORATORY, VISAKHAPATNAM

Sample No: Y2108076 to Y2108087, Y2108185 to Y2108192
Sample received on: 04.09.2021

S. No.	Parameter	Y2108076	Y2108077	Y2108078	Y2108079	Y2108080	Y2108081	Y2108082	Y2108083	Y2108185	Y2108186	Y2108187	Y2108188	Y2108189	Y2108190	Y2108191	Y2108192
1	Alpha – BHC	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
2	Beta– BHC	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
3	Gamma – BHC	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
4	4,4' – DDD	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
5	4,4' – DDE	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
6	4,4' – DDT	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
7	Aldrin	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
8	Dieldrin	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
9	Endosulfan – I	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
10	Endosulfan Sulfate	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
11	Endrin	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
12	Heptachlor	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
13	Heptachlorapoxide	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
14	Methoxychlor	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
15	Endosulfan – II	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16	Delta – BHC	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
17	Endrin Aldehyde	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ

BLQ: Below Limit of Quantitation (0.05 mg/l)

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Kolleru lake Water Samples

S.No.	Sample Code	Sample Description
		KRISHNA DISTRICT
1.	Y2201021	Chandraiah drain at Teacher Colony, Satyanarayana Puram, Gudivada
2.	Y2201022	Budameru drain, Machilipatnam-Nuzid, Kalluru Road No.28, Near Puttagunta Village
3.	Y2201023	Narasannapalem drain at Gudivada Road, Arugolanu Village
4.	Y2201024	Polaraj drain at Kikaluru-Eluru Road
5.		Chinayedlagadi lake at Kikaluru-Eluru Road
6.	Y2201026	Peddaedlagadi lake at Kikaluru-Eluru Road
7.	Y2201027	Chandraiah drain at Polukonda Village
8.	Y2201028	Budameru at Kudaravalli Village
9.	Y2201029	Kolleti kota at Pichikalamarru Village
10.	Y2201030	Circar canal at Pichikalamarru Village
11.	Y2201031	Srungavarappadu drain at Srungavarappadu
12.	Y2201032	(Polraju/Nagaraju) at Atapaka Village
13.	Y2201033	Lake - Bird Life Sanctuary at Atapaka Village
14.	Y2201034	Upputeru at Tadinada Village
		WEST GODAVARI DISTRICT (ELURU)
15.	Y2201057	Gudivakalanka
16.	Y2201058	Mondikodu drain confluence with Kolleru lake at Mondikodu Gram Pachayat of Gudivakalanka Village
17.	Y2201059	Kokkirayalanka
18.	Y2201060	Jodi Kaluva
19.	Y2201061	Chettunnapadu
20.	Y2201062	Pandikodu drain
21.	Y2201063	Tokalapalli drain
22.	Y2201064	Bulusuvagu
23.	Y2201065	Kovvali drain
24.	Y2201066	East Tammileru
25.	Y2201067	West Thammileru

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Vimta
Driven by Quality. Inspired by Science.

Test Report

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/001**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043662
LIMS Report No.: 331529

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samplea**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201021, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093143

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14259/001**
Issue Date:	2022-02-09
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043662
LIMS Report No.:	331529

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/002**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043663
LIMS Report No.: 331530

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201022, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093145

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/002**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043663
LIMS Report No.: 331530

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093146

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14259/003**
Issue Date:	2022-02-09
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043664
LIMS Report No.:	331531

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201023, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093147

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Test Report

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Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/003**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043664
LIMS Report No.: 331531

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093148

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Test Report

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14259/004**
Issue Date:	2022-02-09
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043665
LIMS Report No.:	331532

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201024, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093149

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Test Report

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Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/004**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043665
LIMS Report No.: 331532

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093150

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/005**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043666
LIMS Report No.: 331533

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201025, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093151

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/005**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043666
LIMS Report No.: 331533

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093152

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546216 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14259/006**
Issue Date:	2022-02-09
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043667
LIMS Report No.:	331534

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201026, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093153

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/006**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043667
LIMS Report No.: 331534

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093154

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/007**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043668
LIMS Report No.: 331535

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201027, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093155

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/007**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043668
LIMS Report No.: 331535

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093156

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number:	**VLL/VLS/21/14259/008**
Issue Date:	2022-02-09
Your Ref.	Letter
and Date:	2022-02-02
Lab Ref No.:	1043669
LIMS Report No.:	331536

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201028, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093157

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/008**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043669
LIMS Report No.: 331536

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093158

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Test Report

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Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/009**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043670
LIMS Report No.: 331537

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201029, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093159

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/009**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043670
LIMS Report No.: 331537

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory
Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093160

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/010**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043671
LIMS Report No.: 331538

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201030, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093161

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/010**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043671
LIMS Report No.: 331538

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093162

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Test Report

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Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: VLL/VLS/21/14259/011
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043672
LIMS Report No.: 331539

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201031, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093163

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/011**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043672
LIMS Report No.: 331539

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory
Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093164

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: VLL/VLS/21/14259/012
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043673
LIMS Report No.: 331540

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201032, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

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Test Report

Issued To:
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Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/012**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043673
LIMS Report No.: 331540

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093166

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14259/013**
Issue Date:	2022-02-09
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043674
LIMS Report No.:	331541

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201033, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093167

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/013**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043674
LIMS Report No.: 331541

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093168

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14259/014**
Issue Date:	2022-02-09
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043675
LIMS Report No.:	331542

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201034, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093169

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/014**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043675
LIMS Report No.: 331542

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093170

Vimta

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/015**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043676
LIMS Report No.: 331543

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201057, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093171

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/015**
Issue Date: 2022-02-09
Your Ref. and Date: Letter 2022-02-02
Lab Ref No.: 1043676
LIMS Report No.: 331543

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory
Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093172

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Test Report

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/016**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043677
LIMS Report No.: 331544

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201058, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093173

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Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/016**
Issue Date: 2022-02-09
Your Ref. and Date: Letter 2022-02-02
Lab Ref No.: 1043677
LIMS Report No.: 331544

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory
Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093174

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Test Report

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14259/017**
Issue Date:	2022-02-09
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043678
LIMS Report No.:	331545

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201059, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093175

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/017**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043678
LIMS Report No.: 331545

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

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Test Report

Issued To:
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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/018**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043679
LIMS Report No.: 331546

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201060, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093177

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/018**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043679
LIMS Report No.: 331546

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093178

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/019**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043680
LIMS Report No.: 331547

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201061, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093179

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/019**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043680
LIMS Report No.: 331547

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory
Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093180

Vimta
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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/020**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043681
LIMS Report No.: 331548

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201062, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093181

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14259/020**
Issue Date:	2022-02-09
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043681
LIMS Report No.:	331548

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093182

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number:	**VLL/VLS/21/14259/021**
Issue Date:	2022-02-09
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043682
LIMS Report No.:	331549

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201063, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093183

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/021**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043682
LIMS Report No.: 331549

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093184

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/022**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043683
LIMS Report No.: 331550

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201064, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093185

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14259/022**
Issue Date:	2022-02-09
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043683
LIMS Report No.:	331550

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093186

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Test Report

Issued To:
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Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: VLL/VLS/21/14259/023
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043684
LIMS Report No.: 331551

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201065, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093187

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/023**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043684
LIMS Report No.: 331551

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory
Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093188

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/024**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043665
LIMS Report No.: 331552

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201066, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093189

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/024**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043685
LIMS Report No.: 331552

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093190

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14259/025**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043686
LIMS Report No.: 331553

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru Lake Water Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201067, Water samples Extracted with N-Hexane stored in 1ml vial submitted by customer		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	1 Vial		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
2	Beta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
3	Gamma HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ
4	Aldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
5	Dieldrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
6	Endosulfan	mg/L	SOP NO 15/31A & 15/31B	BLQ
7	Endosulfan I	mg/L	SOP NO 15/31A & 15/31B	BLQ
8	Endosulfan II	mg/L	SOP NO 15/31A & 15/31B	BLQ
9	Endosulfan sulfate	mg/L	SOP NO 15/31A & 15/31B	BLQ
10	Heptachlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
11	Heptachlor epoxide	mg/L	SOP NO 15/31A & 15/31B	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093191

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14259/025**
Issue Date: 2022-02-09
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043686
LIMS Report No.: 331553

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/L	SOP NO 15/31A & 15/31B	BLQ
13	Endrin aldehyde	mg/L	SOP NO 15/31A & 15/31B	BLQ
14	Endrin ketone	mg/L	SOP NO 15/31A & 15/31B	BLQ
15	Methoxychlor	mg/L	SOP NO 15/31A & 15/31B	BLQ
16	4,4- DDE	mg/L	SOP NO 15/31A & 15/31B	BLQ
17	4,4- DDD	mg/L	SOP NO 15/31A & 15/31B	BLQ
18	4,4- DDT	mg/L	SOP NO 15/31A & 15/31B	BLQ
19	Delta HCH	mg/L	SOP NO 15/31A & 15/31B	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS ; BLQ: Below Limit of Quantification;
Limit of Quantification for Pesticide residues :0.00002 mg/L.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1093192

ANDHRA PRADESH POLLUTION CONTROL BOARD
ZONAL LABORATORY – VIJAYAWADA
Plot No.41, Sri Kanakadurga Officers' Colony,
Gurunanak Road, Vijayawada-520008

K.SRINIVAS, M.Sc., M.Tech.,
Senior Environmental Scientist

e.mail: zovjalab-ses1@appcb.gov.in
Tel No: 0866-2546218

Kolleru lake Sediment Samples

S.No.	Sample Code	Sample Description
		KRISHNA DISTRICT
1.	Y2201SL001	Chandraiah drain at Teacher Colony, Satyanarayana Puram, Gudivada
2.	Y2201SL002	Budameru drain, Machilipatnam-Nuzid, Kalluru Road No.28, Near Puttagunta Village
3.	Y2201SL003	Narasannapalem drain at Gudivada Road, Arugolanu Village
4.	Y2201SL004	Polaraj drain at Kikaluru-Eluru Road
5.	Y2201SL005	Chinayedlagadi lake at Kikaluru-Eluru Road
6.	Y2201SL006	Peddaedlagadi lake at Kikaluru-Eluru Road
7.	Y2201SL007	Chandraiah drain at Polukonda Village
8.	Y2201SL008	Budameru at Kudaravalli Village
9.	Y2201SL009	Kolleti kota at Pichikalamarru Village
10.	Y2201SL010	Circar canal at Pichikalamarru Village
11.	Y2201SL011	Srungavarappadu drain at Srungavarappadu
12.	Y2201SL012	(Polraju/Nagaraju) at Atapaka Village
13.	Y2201SL013	Lake - Bird Life Sanctuary at Atapaka Village
14.	Y2201SL014	Upputeru at Tadinada Village
		WEST GODAVARI DISTRICT (ELURU)
15.	Y2201SL015	Gudivakalanka
16.	Y2201SL016	Mondikodu drain confluence with Kolleru lake at Mondikodu Gram Pachayat of Gudivakalanka Village
17.	Y2201SL017	Kokkirayalanka
18.	Y2201SL018	Jodi Kaluva
19.	Y2201SL019	Chettunnapadu
20.	Y2201SL020	Pandikodu drain
21.	Y2201SL021	Tokalapalli drain
22.	Y2201SL022	Bulusuvagu
23.	Y2201SL023	Kovvali drain
24.	Y2201SL024	East Tammileru
25.	Y2201SL025	West Thammileru

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

K. Srinivas

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/001**
Issue Date: 2022-02-08
Your Ref. and Date: Letter 2022-02-02
Lab Ref No.: 1043700
LIMS Report No.: 331313

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL001		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092716

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/001**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043700
LIMS Report No.: 331313

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092717

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Ph:2546218 Mob:9177303281

Registration/Report Number:	**VLL/VLS/21/14260/002**
Issue Date:	2022-02-08
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043701
LIMS Report No.:	331314

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL002		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092718

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Test Report

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/002**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043701
LIMS Report No.: 331314

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092719

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/003**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043702
LIMS Report No.: 331315

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL003		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092720

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/003**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043702
LIMS Report No.: 331315

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092721

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/004**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043703
LIMS Report No.: 331316

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Koilleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL004		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092722

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/004**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043703
LIMS Report No.: 331316

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092723

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/005**
Issue Date: 2022-02-08
Your Ref: and Date: Letter 2022-02-02
Lab Ref No.: 1043705
LIMS Report No.: 331317

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL005		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092724

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/005**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043705
LIMS Report No.: 331317

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092725

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/006**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043706
LIMS Report No.: 331318

Kind Attn: Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL006		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092726

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/006**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043706
LIMS Report No.: 331318

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

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Registration/Report Number: **VLL/VLS/21/14260/007**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043707
LIMS Report No.: 331319

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL007		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092728

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14260/007**
Issue Date:	2022-02-08
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043707
LIMS Report No.:	331319

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/008**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043708
LIMS Report No.: 331320

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL008		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092730

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/008**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043708
LIMS Report No.: 331320

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092731

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/009**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043709
LIMS Report No.: 331321

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL009		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092732

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Test Report

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/009**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043709
LIMS Report No.: 331321

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory
Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092733

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/010**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043710
LIMS Report No.: 331322

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL010		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory
Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092734

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/010**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043710
LIMS Report No.: 331322

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092735

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/011**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043711
LIMS Report No.: 331323

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL011		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092736

Vimta

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Test Report

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Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/011**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043711
LIMS Report No.: 331323

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092737

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/012**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043712
LIMS Report No.: 331324

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL012		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092738

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Test Report

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Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/012**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043712
LIMS Report No.: 331324

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14260/013**
Issue Date:	2022-02-08
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043713
LIMS Report No.:	331325

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL013		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092740

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Test Report

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/013**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043713
LIMS Report No.: 331325

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092741

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/014**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043714
LIMS Report No.: 331326

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL014		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092742

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Test Report

Issued To:
Andhra Pradesh Pollution Control Board - Zonal Laboratory - Vijayawada,
Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/014**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043714
LIMS Report No.: 331326

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092743

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Test Report

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/015**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043715
LIMS Report No.: 331327

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL015		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory
Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092744

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/015**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043715
LIMS Report No.: 331327

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092745

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: VLL/VLS/21/14260/016
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043716
LIMS Report No.: 331328

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	Kolleru sediment Samples		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y22D1SL016		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/016**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043716
LIMS Report No.: 331328

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092747

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/017**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043717
LIMS Report No.: 331329

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL017		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092748

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/017**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043717
LIMS Report No.: 331329

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092749

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/018**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043718
LIMS Report No.: 331330

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL018		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092750

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Test Report

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Plot no. 41, Sri Kanakadurga Officer's Colony,
Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/018**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043718
LIMS Report No.: 331330

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092751

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/019**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043719
LIMS Report No.: 331331

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL019		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092752

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/019**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043719
LIMS Report No.: 331331

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092753

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/020**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043720
LIMS Report No.: 331332

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL020		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory
Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092754

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/020**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043720
LIMS Report No.: 331332

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092755

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/021**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043721
LIMS Report No.: 331333

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL021		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092756

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Test Report

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: VLL/VLS/21/14260/021
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043721
LIMS Report No : 331333

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092757

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/022**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043722
LIMS Report No.: 331334

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL022		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092758

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/022**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043722
LIMS Report No.: 331334

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092759

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/023**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043724
LIMS Report No.: 331335

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL023		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092760

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Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14260/023**
Issue Date:	2022-02-08
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043724
LIMS Report No.:	331335

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092761

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/024**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043725
LIMS Report No.: 331336

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL024		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092762

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number: **VLL/VLS/21/14260/024**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043725
LIMS Report No.: 331336

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092763

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Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Registration/Report Number: **VLL/VLS/21/14260/025**
Issue Date: 2022-02-08
Your Ref: Letter
and Date: 2022-02-02
Lab Ref No.: 1043726
LIMS Report No.: 331337

Kind Attn:Mr. K. Srinivas

Customer Provided Details :			
Sample Name:	**Kolleru sediment Samples**		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number/Sample Code:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Pesticides		
Other Details if Any:	Y2201SL025		
Lab Provided Details :			
Sample Received Date:	2022-02-02	Sample Registration Date:	2022-02-02
Analysis Starting Date:	2022-02-04	Analysis Completion Date:	2022-02-07
Quantity Received:	~25gms X 1No		
Sampling Details:	NA		
Other Details if Any:	NA		

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
1	Alpha HCH	mg/kg	AOAC_2007.01	BLQ
2	Beta HCH	mg/kg	AOAC_2007.01	BLQ
3	Gamma HCH	mg/kg	AOAC_2007.01	BLQ
4	Aldrin	mg/kg	AOAC_2007.01	BLQ
5	Dieldrin	mg/kg	AOAC_2007.01	BLQ
6	Endosulfan	mg/kg	AOAC_2007.01	BLQ
7	Endosulfan I	mg/kg	AOAC_2007.01	BLQ
8	Endosulfan II	mg/kg	AOAC_2007.01	BLQ
9	Endosulfan sulfate	mg/kg	AOAC_2007.01	BLQ
10	Heptachlor	mg/kg	AOAC_2007.01	BLQ
11	Heptachlor epoxide	mg/kg	AOAC_2007.01	BLQ

Name and Designation of Authorized Signatory

Narasimha Rao Danduprolu
Deputy Manager

NO: LSF-B 1092764

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Gurunanak Road,
Vijayawada-520008
Andhra Pradesh,IND
Ph:2546218 Mob:9177303281

Kind Attn:Mr. K. Srinivas

Registration/Report Number:	**VLL/VLS/21/14260/025**
Issue Date:	2022-02-08
Your Ref:	Letter
and Date:	2022-02-02
Lab Ref No.:	1043726
LIMS Report No.:	331337

TEST RESULTS

S. No.	Test Parameters	UOM	Method	Results
12	Endrin	mg/kg	AOAC_2007.01	BLQ
13	Endrin aldehyde	mg/kg	AOAC_2007.01	BLQ
14	Endrin ketone	mg/kg	AOAC_2007.01	BLQ
15	Methoxychlor	mg/kg	AOAC_2007.01	BLQ
16	4,4- DDE	mg/kg	AOAC_2007.01	BLQ
17	4,4- DDD	mg/kg	AOAC_2007.01	BLQ
18	4,4- DDT	mg/kg	AOAC_2007.01	BLQ
19	Delta HCH	mg/kg	AOAC_2007.01	BLQ

Results relate only to the sample tested.

Remarks: Instrument used:GC-MS/MS; BLQ: Below Limit of Quantification;
Limit of Qunatification for Pesticide residues : 0.01 mg/kg.

- END OF THE TEST REPORT -

Name and Designation of Authorized Signatory

Narasimha Rao Dandupolu
Deputy Manager

NO: LSF-B 1092765

Annexure - 6

Designated Best Use Water Quality Criteria

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	**A**	Total Coliforms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20C 2mg/l or less
Outdoor bathing (Organised)	**B**	Total Coliforms Organism MPN/100ml shall be 500 or less pH between 6.5 and 8.5 Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20C 3mg/l or less
Drinking water source after conventional treatment and disinfection	**C**	Total Coliforms Organism MPN/100ml shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20C 3mg/l or less
Propagation of Wild life and Fisheries	**D**	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	**E**	pH betwwn 6.0 to 8.5 Electrical Conductivity at 25C micro mhos/cm Max.2250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l

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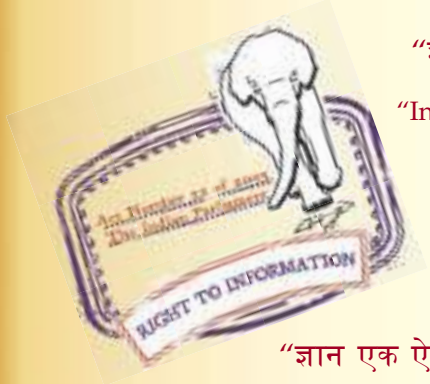
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 10500 (2012): Drinking water [FAD 25: Drinking Water]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"



"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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भारतीय मानक

पीने का पानी — विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

ICS 13.060.20

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

May 2012 **Price Group 6**

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Drinking Water Sectional Committee had been approved by the Food and Agriculture Division Council.

This standard was originally published in 1983. A report prepared by the World Health Organization in cooperation with the World Bank showed that in 1975, some 1 230 million people were without safe water supplies. These appalling facts were central to the United Nations decision to declare an International Drinking Water Supply and Sanitation decade, beginning in 1981. Further, the VI Five-Year Plan of India had made a special provision for availability of safe drinking water for the masses. Therefore, the standard was formulated with the objective of assessing the quality of water resources, and to check the effectiveness of water treatment and supply by the concerned authorities.

The first revision was undertaken to take into account the up-to-date information available about the nature and effect of various contaminants as also the new techniques for identifying and determining their concentration. Based on experience gained additional requirements for alkalinity; aluminium and boron were incorporated and the permissible limits for dissolved solids, nitrate and pesticides residues modified.

As per the eleventh five year plan document of India (2007-12), there are about 2.17 lakh quality affected habitations in the country with more than half affected with excess iron, followed by fluoride, salinity, nitrate and arsenic in that order. Further, approximately, 10 million cases of diarrhoea, more than 7.2 lakh typhoid cases and 1.5 lakh viral hepatitis cases occur every year a majority of which are contributed by unclean water supply and poor sanitation. The eleventh five year plan document of India (2007-2012) recognizes dealing with the issue of water quality as a major challenge and aims at addressing water quality problems in all quality affected habitations with emphasis on community participation and awareness campaigns as well as on top most priority to water quality surveillance and monitoring by setting up of water quality testing laboratories strengthened with qualified manpower, equipments and chemicals.

The second revision was undertaken to upgrade the requirements of the standard and align with the internationally available specifications on drinking water. In this revision assistance has been derived from the following:

a) EU Directives relating to the quality of water intended for human consumption (80/778/EEC) and Council Directive 98/83/EC.

b) USEPA standard — National Primary Drinking Water Standard. EPA 816-F-02-013 dated July, 2002.

c) WHO Guidelines for Drinking Water Quality. 3rd Edition Vol. 1 Recommendations, 2008.

d) Manual on Water Supply and Treatment, third edition — revised and updated May 1999, Ministry of Urban Development, New Delhi.

This standard specifies the acceptable limits and the permissible limits in the absence of alternate source. It is recommended that the acceptable limit is to be implemented as values in excess of those mentioned under 'Acceptable' render the water not suitable. Such a value may, however, be tolerated in the absence of an alternative source. However, if the value exceeds the limits indicated under 'permissible limit in the absence of alternate source' in col 4 of Tables 1 to 4, the sources will have to be rejected.

Pesticide residues limits and test methods given in Table 5 are based on consumption pattern, persistence and available manufacturing data. The limits have been specified based on WHO guidelines, wherever available. In cases where WHO guidelines are not available, the standards available from other countries have been examined and incorporated, taking in view the Indian conditions.

In this revision, additional requirements for ammonia, chloramines, barium, molybdenum, silver, sulphide, nickel, polychlorinated biphenyls and trihalomethanes have been incorporated while the requirements for colour, turbidity, total hardness, free residual chlorine, iron, magnesium, mineral oil, boron, cadmium, total arsenic, lead, polynuclear aromatic hydrocarbons, pesticides and bacteriological requirements have been modified.

In this revision, requirement and test method for virological examination have been included. Further, requirements and test methods for cryptosporidium and giardia have also been specified.

Routine surveillance of drinking water supplies should be carried out by the relevant authorities to understand the risk of specific pathogens and to define proper control procedures. The WHO Guidelines for Drinking Water Quality, 3rd Edition, Vol. 1 may be referred for specific recommendations on using a water safety approach incorporating risk identification. Precautions/Care should be taken to prevent contamination of drinking water from chlorine resistant parasites such as cryptosporidium species and giardia.

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for drinking water.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard the following definition shall apply.

3.1 Drinking Water — Drinking water is water intended for human consumption for drinking and cooking purposes from any source. It includes water (treated or untreated) supplied by any means for human consumption.

4 REQUIREMENTS

Drinking water shall comply with the requirements given in Tables 1 to 4. The analysis of pesticide residues given in Table 3 shall be conducted by a recognized laboratory using internationally established test method meeting the residue limits as given in Table 5.

Drinking water shall also comply with bacteriological requirements (*see* **4.1**), virological requirements (*see* **4.2**) and biological requirements (*see* **4.3**).

4.1 Bacteriological Requirements

4.1.1 *Water in Distribution System*

Ideally, all samples taken from the distribution system including consumers' premises, should be free from coliform organisms and the following bacteriological quality of drinking water collected in the distribution system, as given in Table 6 is, therefore specified when tested in accordance with IS 1622.

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

Table 1 Organoleptic and Physical Parameters
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, *Max*	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	*p*H value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause **6** of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under ‘acceptable’ render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under ‘permissible limit in the absence of alternate source’ in col 4, above which the sources will have to be rejected.

Table 3 Parameters Concerning Toxic Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation	IS 3025 (Part 41)	—
ii)	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 27)	—
iii)	Lead (as Pb), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 47)	—
iv)	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation	IS 3025 (Part 48)/ Mercury analyser	—
v)	Molybdenum (as Mo), mg/l, *Max*	0.07	No relaxation	IS 3025 (Part 2)	—
vi)	Nickel (as Ni), mg/l, *Max*	0.02	No relaxation	IS 3025 (Part 54)	—
vii)	Pesticides, µg/l, *Max*	See Table 5	No relaxation	See Table 5	—
viii)	Polychlorinated biphenyls, mg/l, *Max*	0.000 5	No relaxation	ASTM 5175*	— or APHA 6630
ix)	Polynuclear aromatic hydrocarbons (as PAH), mg/l, *Max*	0.000 1	No relaxation	APHA 6440	—
x)	Total arsenic (as As), mg/l, *Max*	0.01	0.05	IS 3025 (Part 37)	—
xi)	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 52)	—
xii)	Trihalomethanes:				
	a) Bromoform, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	b) Dibromochloromethane, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	c) Bromodichloromethane, mg/l, *Max*	0.06	No relaxation	ASTM D 3973-85* or APHA 6232	—
	d) Chloroform, mg/l, *Max*	0.2	No relaxation	ASTM D 3973-85* or APHA 6232	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under ‘acceptable’ render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source’ in col 4, above which the sources will have to be rejected.

Table 4 Parameters Concerning Radioactive Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 14194	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Radioactive materials:				
	a) Alpha emitters Bq/l, *Max*	0.1	No relaxation	Part 2	—
	b) Beta emitters Bq/l, *Max*	1.0	No relaxation	Part 1	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under ‘acceptable’ render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under ‘permissible limit in the absence of alternate source’ in col 4, above which the sources will have to be rejected.

Table 5 Pesticide Residues Limits and Test Method
(*Foreword* and *Table* 3)

Sl No.	Pesticide	Limit µg/l	Method of Test, Ref to	
			USEPA	AOAC/ ISO
(1)	(2)	(3)	(4)	(5)
i)	Alachlor	20	525.2, 507	—
ii)	Atrazine	2	525.2, 8141 A	—
iii)	Aldrin/ Dieldrin	0.03	508	—
iv)	Alpha HCH	0.01	508	—
v)	Beta HCH	0.04	508	—
vi)	Butachlor	125	525.2, 8141 A	—
vii)	Chlorpyriphos	30	525.2, 8141 A	—
viii)	Delta HCH	0.04	508	—
ix)	2,4- Dichlorophenoxyacetic acid	30	515.1	—
x)	DDT (*o, p* and *p, p* – Isomers of DDT, DDE and DDD)	1	508	AOAC 990.06
xi)	Endosulfan (alpha, beta, and sulphate)	0.4	508	AOAC 990.06
xii)	Ethion	3	1657 A	—
xiii)	Gamma — HCH (Lindane)	2	508	AOAC 990.06
xiv)	Isoproturon	9	532	—
xv)	Malathion	190	8141 A	—
xvi)	Methyl parathion	0.3	8141 A	ISO 10695
xvii)	Monocrotophos	1	8141 A	—
xviii)	Phorate	2	8141 A	—

NOTE — Test methods are for guidance and reference for testing laboratory. In case of two methods, USEPA method shall be the reference method.

Table 6 Bacteriological Quality of Drinking Water[1)]
(*Clause* 4.1.1)

Sl No.	Organisms	Requirements
(1)	(2)	(3)
i)	*All water intended for drinking*:	
	a) *E. coli* or thermotolerant coliform bacteria[2), 3)]	Shall not be detectable in any 100 ml sample
ii)	*Treated water entering the distribution system*:	
	a) *E. coli* or thermotolerant coliform bacteria[2)]	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample
iii)	*Treated water in the distribution system*:	
	a) *E. coli* or thermotolerant coliform bacteria	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample

[1)]Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.

[2)]Although, *E. coli* is the more precise indicator of faecal pollution, the count of thermotolerant coliform bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.

[3)]It is recognized that, in the great majority of rural water supplies in developing countries, faecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

system including consumers' premises, should be free from virus.

4.2.2 None of the generally accepted sewage treatment methods yield virus-free effluent. Although a number of investigators have found activated sludge treatment to be superior to trickling filters from this point of view, it seems possible that chemical precipitation methods will prove to be the most effective.

4.2.3 Virus can be isolated from raw water and from springs, enterovirus, reovirus, and adenovirus have been found in water, the first named being the most resistant to chlorination. If enterovirus are absent from chlorinated water, it can be assumed that the water is safe to drink. Some uncertainty still remains about the virus of infectious hepatitis, since it has not so far been isolated but in view of the morphology and resistance of enterovirus it is likely that, if they have been inactivated hepatitis virus will have been inactivated also.

4.2.4 An exponential relationship exists between the rate of virus inactivation and the redox potential. A redox potential of 650 mV (measured between platinum and calomel electrodes) will cause almost instantaneous inactivation of even high concentrations of virus. Such a potential can be obtained with even a low concentration of free chlorine, but only with an extremely high concentration of combined chlorine. This oxidative inactivation may be achieved with a number of other oxidants also, for example, iodine, ozone and potassium permanganate, but the effect of the oxidants will always be counteracted, if reducing components, which are mainly organic, are present. As a consequence, the sensitivity of virus towards disinfectants will depend on the *milieu* just as much as on the particular disinfectant used.

4.2.5 Viruses are generally resistant to disinfectants as well as get protected on account of presence of particulate and organic matter in water. Because the difference between the resistance of coliform organisms and of virus to disinfection by oxidants increases with increasing concentration of reducing components, for example, organic matter, it cannot be assumed that the absence of available coliform organisms implies freedom from active virus under circumstances where a free chlorine residual cannot be maintained. Sedimentation and slow sand filtration in themselves may contribute to the removal of virus from water.

4.2.6 In practice, >0.5 mg/l of free chlorine for 1 h is sufficient to inactivate virus, even in water that was originally polluted provided the water is free from particulates and organic matter.

4.2.7 MS2 phage are indicator of viral contamination in drinking water. MS2 phage shall be absent in 1 litre of water when tested in accordance with USEPA method 1602. If MS2 phage are detected in the drinking water, virological examination shall be done by the Polymerase Chain Reaction (PCR) method for virological examination as given in Annex B. USEPA method in Manual of Method for Virology Chapter 16, June 2001 shall be the alternate method. If viruses are detected, the cause shall be determined by immediate further investigation.

4.3 Biological Requirements

4.3.1 Ideally, all samples taken including consumers premises should be free from biological organisms. Biological examination is of value in determining the causes of objectionable tastes and odours in water and controlling remedial treatments, in helping to interpret the results of various chemical analysis, and in explaining the causes of clogging in distribution pipes and filters. In some instances, it may be of use in demonstrating that water from one source has been mixed with that from another.

4.3.2 The biological qualities of water are of greater importance when the supply has not undergone the conventional flocculation and filtration processes, since increased growth of methane-utilizing bacteria on biological slimes in pipes may then be expected, and the development of bryozoal growths such as *Plumatella* may cause operational difficulties.

4.3.3 Some of the animalcules found in water mains may be free-living in the water, but others such as *Dreissena* and *Asellus* are more or less firmly attached to the inside of the mains. Although these animalcules are not themselves pathogenic, they may harbour pathogenic organisms or virus in their intestines, thus protecting these pathogens from destruction by chlorine.

4.3.4 Chlorination, at the dosages normally employed in waterworks, is ineffective against certain parasites, including amoebic cysts; they can be excluded only by effective filtration or by higher chlorine doses than can be tolerated without subsequent dechlorination. *Amoebiasis* can be conveyed by water completely free from enteric bacteria; microscopic examination after concentration is, therefore, the only safe method of identification.

4.3.5 Strict precautions against back-syphonage and cross-connections are required, if amoebic cysts are found in a distribution system containing tested water.

4.3.6 The *cercariae of schistosomiasis* can be detected by similar microscopic examination, but there is, in

any case, no evidence to suggest that this disease is normally spread through piped water supplies.

4.3.7 The cyclops vector of the embryos of *Dracunculus medinensis* which causes dracontiasis or Guinea-worm disease can be found in open wells in a number of tropical areas. They are identifiable by microscopic examination. Such well supplies are frequently used untreated, but the parasite can be relatively easily excluded by simple physical improvements in the form of curbs, drainage, and apron surrounds and other measures which prevent physical contact with the water source.

4.3.8 Cryptosporidium shall be absent in 10 liter of water when tested in accordance with USEPA method 1622 or USEPA method 1623* or ISO 15553 : 2006.

4.3.9 Giardia shall be absent in 10 liter of water when tested in accordance with USEPA method 1623* or ISO 15553 : 2006.

4.3.10 The drinking water shall be free from microscopic organisms such as algae, zooplanktons, flagellates, parasites and toxin producing organisms. An illustrative (and not exhaustive) list is given in Annex C for guidance.

NOTE — In case of dispute, the method indicated by '*' in **4.3.8** and **4.3.9** shall be referee method.

5 SAMPLING

Representative samples of water shall be drawn as prescribed in IS 1622 and IS 3025 (Part 1).

ANNEX A
(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
1622 : 1981	Methods of sampling and microbiological examination of water (*first revision*)
3025	Methods of sampling and test (physical and chemical) for water and waste water:
(Part 1) : 1987	Sampling (*first revision*)
(Part 2) : 2002	Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy
(Part 4) : 1983	Colour (*first revision*)
(Part 5) : 1983	Odour (*first revision*)
(Part 7) : 1984	Taste threshold (*first revision*)
(Part 8) : 1984	Tasting rate (*first revision*)
(Part 10) : 1984	Turbidity (*first revision*)
(Part 11) : 1983	*p*H value (*first revision*)
(Part 16) : 1984	Filterable residue (total dissolved solids) (*first revision*)
(Part 21) : 1983	Total hardness (*first revision*)
(Part 23) : 1983	Alkalinity (*first revision*)
(Part 24) : 1986	Sulphates (*first revision*)
(Part 26) : 1986	Chlorine residual (*first revision*)
(Part 27) : 1986	Cyanide (*first revision*)
(Part 29) : 1986	Sulphide (*first revision*)
(Part 32) : 1988	Chloride (*first revision*)
(Part 34) : 1988	Nitrogen (*first revision*)
(Part 37) : 1988	Arsenic (*first revision*)
(Part 39) : 1989	Oil and grease
(Part 40) : 1991	Calcium
(Part 41) : 1992	Cadmium (*first revision*)
(Part 42) : 1992	Copper (*first revision*)
(Part 43) : 1992	Phenols (*first revision*)
(Part 46) : 1994	Magnesium
(Part 47) : 1994	Lead
(Part 48) : 1994	Mercury
(Part 49) : 1994	Zinc
(Part 52) : 2003	Chromium
(Part 53) : 2003	Iron
(Part 54) : 2003	Nickel
(Part 55) : 2003	Aluminium
(Part 56) : 2003	Selenium
(Part 57) : 2005	Boron
(Part 59) : 2006	Manganese
(Part 60) : 2008	Fluoride
13428 : 2003	Packaged natural mineral water — Specification (*first revision*)
14194	Radionuclides in environmental samples — Method of estimation:
(Part 1) : 1994	Gross beta activity measurement
(Part 2) : 1994	Gross alpha activity measurement
15302 : 2002	Determination of aluminium and barium in water by direct nitrous oxide-acetylene flame atomic absorption spectrometry
15303 : 2002	Determination of antimony, iron and selenium in water by electrothermal atomic absorption spectrometry

ANNEX B

(*Clause* 4.2.7)

POLYMERASE CHAIN REACTION (PCR) METHOD

B-1 GENERAL

The method involves the concentration of viruses from 100 litre of drinking water to 1 ml by membrane filter technique. The concentrate is subjected to amplification using polymerase chain reaction (PCR) and primers based on highly conserved regions of viral genomes. This method can detect as low as 10 genome copies. Stringent precautions are needed to avoid contamination with amplified DNA products leading to false positive reactions. Detection of hepatitis A virus (HAV) RNA and enterovirus (EV) RNA is considered as an indication of presence of viruses in water. Steps involved include concentration of water, RNA extraction, complementary DNA (cDNA) synthesis and PCR.

B-2 CONCENTRATION OF DRINKING WATER

B-2.1 Apparatus

B-2.1.1 *Pressure Pump*

B-2.1.2 *Membrane Filter Assembly with 144 mm Diameter with Tripod Stand*

B-2.1.3 *Pressure Vessel (50 litre capacity) with Pressure Gauge*

B-2.1.4 *Inter-connecting Pressure Tubes*

B-2.2 Reagents

Autoclaved double distilled water shall be used for the preparation of reagents/buffers in this study.

B-2.2.1 *Aluminium Chloride*

B-2.2.2 *HCl/NaOH Urea (Extra Pure)*

B-2.2.3 *Disodium Hydrogen Phosphate* ($Na_2HPO_4.2H_2O$) — 0.2 M, filter sterilized.

B-2.2.4 *Sodium Dihydrogen Phosphate* ($NaH_2PO_4.2H_2O$) — 0.2 M, filter sterilized.

B-2.2.5 *Citric Acid* — 0.1 M, filter sterilized.

B-2.2.6 *L-Arginine* — 0.5 M, filter sterilized.

B-2.2.7 *Urea-Arginine Phosphate Buffer* (*U-APB*) — Mix 4.5 g of urea with 2 ml of 0.2 M NaH_2PO_4 and 2 ml of 0.5 M L - Arginine and make up the volume to 50 ml with sterile distilled water. The *p*H of the eluent shall be 9.0.

B-2.2.8 *Magnesium Chloride* ($MgCl_2$) — 1 M.

B-2.2.9 *McII Vaines Buffer* (*p*H *5.0*) — Mix 9.7 ml of 0.1 M citric acid with 10.3 ml of 0.2 M $Na_2HPO_4.2H_2O$ under sterile conditions.

B-2.3 Procedure

Filter 100 litre of drinking water sample through membrane filter assembly using either positively charged membrane of 144 mm diameter or 0.22 micron diameter pore size nitrocellulose membrane. For positively charged membrane the test water *p*H need not be adjusted. But for the 0.22 micron nitrocellulose membrane adjust the *p*H to 3.5 after adding the aluminium chloride as a coagulant to a final concentration of 0.000 5 M.

At lower *p*H pass the water through the membrane. The flow rate shall be 40 litre/h approximately. After the completion of the filtration, elute the adsorbed particles using 100 ml of urea-arginine phosphate buffer (U-APB). Precipitate the suspended particles using 1 ml of magnesium chloride (1 M). Dissolve the resultant precipitate centrifuged out of the sample in 800-1.0 ml of McII vaines buffer. The processed sample can be stored at refrigerator until required.

B-3 RNA EXTRACTION

B-3.1 Apparatus

B-3.1.1 *Cooling Centrifuge*

B-3.1.2 *Deep Freezer (–20°C)*

B-3.1.3 *Vortex Mixer*

B-3.1.4 *Pipette Man*

B-3.2 Reagents

B-3.2.1 *Cetyl Trimethyl Ammonium Bromide (CTAB) Buffer*

CTAB	:	1 percent
Sodium Dodecyl Sulphate (SDS)	:	1 percent
EDTA	:	20 mM
Sodium Chloride	:	1 M

B-3.2.2 *Phenol, Chloroform and Isoamylalcohol in the ratio of 25:24:1 (PCI)*

B-3.2.3 *Ethanol*

B-3.2.4 *TE Buffer (p*H *8.0)*

Tris base	:	1 M
EDTA	:	0.5 M

B-3.2.5 *Sodium Acetate* — 3 M.

B-3.3 Procedure

Treat 300 µl of concentrated water sample with equal volume of CTAB and 1/10th volume of PCI. Vortex and centrifuge at 5 000 × g for 30 min at 4°C. Add 1/10th volume of 3 M sodium acetate and double the volume of cold ethanol to the aqueous layer. Keep the mixture at either at –20°C for overnight or in liquid nitrogen for 2-5 min. Centrifuge at 10 000 × g, for 30 min at 4°C. Discard the supernatant and air dry the pellet and dissolve it in 20 µl TE buffer.

B-4 COMPLEMENTARY DNA (c DNA) SYNTHESIS

B-4.1 Apparatus

B-4.1.1 *PCR Machine*

B-4.1.2 *Deep Freezer (–20°C)*

B-4.2 Reagents

B-4.2.1 *cDNA Synthesis Kit*

B-4.3 Procedure

Suspend the extracted RNA in 20 µl of cDNA reaction mixture, which consists of 4 µl of 5X reverse transcriptase reaction buffer [250 mM TRIS–HCl (*p*H 8.5), 40 mM KCl, 150 mM $MgCl_2$, 5 mM dithiothreitol (DTT)], 0.5 µl of 10 mM deoxynucleotide phosphate (dNTP), 2 µl of hexa nucleotide mixture, 1 µl of 25 U of Maloney Murine Leukaemia Virus (M-MuLV) reverse transcriptase, 0.5 µl of 20 U of human placental RNase inhibitor. Heat the reaction mixture to 95°C for 5 min and rapidly chill on ice, this is followed by the addition of 1 µl (25 U/µl) of M-MuLV reverse transcriptase. Incubate the reaction mixture as given by the manufacturer of the kit and quickly chill the reaction tube on ice.

B-5 PCR AMPLIFICATION

B-5.1 Apparatus

B-5.1.1 *PCR Machine*

B-5.1.2 *Deep Freezer (–20°C)*

B-5.1.3 *Micropippette*

B-5.2 Reagents

B-5.2.1 *Primers for EV and HAV*

EV sense primer, 5’ — TCC TCC GGC CCC TGA ATG CG — 3’

antisense primer, 5’ — ATT GTC ACC ATA AGC AGC CA — 3’

HAV sense primer, 5’ — GTTTT GCTCC TCTTT ATCAT GCTAT G-3’

antisense primer, 5’ — GGAAA TGTCT CAGGT ACTTT CTTTG-3’

B-5.2.2 *PCR Master Mix*

B-5.2.3 *Mineral Oil*

B-5.3 Procedure

B-5.3.1 *PCR Amplification for Hepatitis A Virus (HAV)*

In 5 µl of cDNA, add 95 µl of a PCR Master Mix (10 mM TRIS–HCl (*p*H 8.3), 50 mM KCl, 2.5 mM $MgCl_2$, 0.01 percent gelatin (1× PCR buffer), 200 µM of each dNTP, 1.5 U of *Thermus aquaticus* polymerase). Add 25 pico moles of sense and antisense oligonucleotide primers of HAV and overlay with mineral oil. Appropriate positive and negative controls shall be included with each run. Set the following reaction at thermo cycler:

Denaturation at 94°C for 2 min

Denaturation for	1.0 min	at 94°C	} 35 cycles
Annealing for	1.0 min	at 57°C	
Extension for	1.3 min	at 72°C	

Final extension at 72°C for 7 min.

B-5.3.2 *PCR Amplification for Enterovirus (EV)*

In 5 µl of cDNA, add 95 µl of a PCR Master Mix (10 mM TRIS–HCl (*p*H 8.3), 50 mM KCl, 2.5 mM $MgCl_2$, 0.01 percent gelatin (1X PCR buffer), 200 µM of each dNTP, 1.5 U of *Thermus aquaticus* polymerase). Add 25 pico moles of sense and antisense oligonucleotide primers of EV and overlay with mineral oil. Appropriate positive and negative controls shall be included with each run. Set the following reaction at thermo cycler:

Denaturation at 94°C for 2 min

Denaturation for	1.0 min	at 94°C	} 35 cycles
Annealing for	1.0 min	at 42°C	
Extension for	2.0 min	at 72°C	

Final extension at 72°C for 7 min.

B-6 AGAROSE GEL ELECTROPHORESIS

B-6.1 Apparatus

B-6.1.1 *Micropippette*

B-6.1.2 *Electrophoresis Apparatus*

B-6.1.3 *Gel Documentation System*

B-6.2 Reagents

B-6.2.1 *Running Buffer* — 50X TAE buffer

Tris base/Tris buffer : 121.00 g

Glacial acetic acid	:	28.55 ml
0.5 M EDTA	:	50 .00 ml
Distilled water (autoclaved)	:	300.45 ml

Make the final volume upto 1 000 ml with deionised distilled water, sterilize and store at 4°C. The final concentration for the preparation of agarose gel and to run the gel shall be 1X.

B-6.2.2 *Tracking Dye* — 6X bromophenol blue.

B-6.2.3 *Ethidium Bromide* — 0.5 µg/ml.

B-6.3 Procedure

Run the PCR amplified product of EV and HAV on 1.5 percent agarose gel using 1X TAE buffer. Load 10 µl of amplified product after mixing it with 1 µl 10X loading dye. Run the molecular weight marker along with the samples. Run the electrophoresis at 100 V for 30 min. Stain the gel with ethidium bromide (0.5 µl/ml) for 20 min. Wash it with distilled water and view under UV transilluminator and photograph the gel to analyse the band pattern. EV gives the band as 155 base pair and the HAV gives band as 225 base pair.

ANNEX C

(*Clause* 4.3.10)

ILLUSTRATIVE LIST OF MICROSCOPIC ORGANISMS PRESENT IN WATER

Sl No. (1)	*Classification of Microscopic Organism* (2)	*Group and Name of the Organism* (3)	*Habitat* (4)	*Effect of the Organisms and Significance* (5)
i)	Algae	a) Chlorophyceae:		
		1) *Species of* Coelastrum, Gomphospherium, Micractinium, Mougeotia, Oocystis, Euastrum, Scenedesmus, Actinastrum, Gonium, Eudorina Pandorina, Pediastrum, Zygnema, Chlamydomonas, Careteria, Chlorella, Chroococcus, Spirogyra, Tetraedron, Chlorogonium, Stigeoclonium	Polluted water, impounded sources	Impart colouration
		2) *Species of* Pandorina, Volvox, Gomphospherium, Staurastrum, Hydrodictyon, Nitella	Polluted waters	Produce taste and odour
		3) *Species of* Rhizoclonium, Cladothrix, Ankistrodesmus, Ulothrix, Micrasterias, Chromulina	Clean water	Indicate clean condition
		4) *Species of* Chlorella, Tribonema, Clostrium, Spirogyra, Palmella	Polluted waters, impounded sources	Clog filters and create impounded difficulties
		b) Cyanophyceae:		
		1) *Species of* Anacystis and Cylindrospermum	Polluted waters	Cause water bloom and impart colour
		2) *Species of* Anabena, Phormidium, Lyngbya, Arthrospira, Oscillatona	Polluted waters	Impart colour
		3) *Species of* Anabena, Anacystis, Aphanizomenon	Polluted waters, impounded sources	Produce taste and odour
		4) *Species of* Anacystis, Anabena, Coelospherium, Cleotrichina, Aphanizomenon	Polluted waters	Toxin producing
		5) *Species of* Anacystis, Rivularia, Oscillatoria, Anabena	Polluted waters	Clog filters

Sl No. (1)	*Classification of Microscopic Organism* (2)	*Group and Name of the Organism* (3)	*Habitat* (4)	*Effect of the Organisms and Significance* (5)
		6) *Species of* Rivularia	Calcareous waters and also rocks	Bores rocks and calcareous strata and causes matted growth
		7) *Species of* Agmenellum, Microcoleus, Lemanea	Clean waters	Indicators of purification
		c) Diatoms (Bacillareophyceae):		
		1) *Species of* Fragillaria, Stephanodiscus, Stauroneis	—	Cause discoloration
		2) *Species of* Asterionella, Tabellaria	Hill streams high altitude, torrential and temperate waters	Taste and odour producing clog filters
		3) *Species of* Synedra and Fragillavia	Polluted waters	Taste and odour producing
		4) *Species of* Nitzchia, Gomphonema	Moderately polluted waters	Cause discoloration
		5) *Species of* Cymbela, Synedra, Melosira, Navicula, Cyclotella, Fragillaria, Diatoma, Pleurogsigma	Rivers and streams impounded sources	Clog filters and cause operational difficulties
		6) *Species of* Pinmularia, Surinella, Cyclotella, Meridion, Cocconeis	Clean waters	Indicators of purification
		d) Xanthophyceae:		
		Species of Botryococcus	Hill streams, high altitude and temperate waters	Produces coloration
ii)	Zooplankton	a) Protozoa:		
		1) Amoeba, Giardia Lamblia Arcella, Difflugia, Actinophrys	Polluted waters	Pollution indicators
		2) Endamoeba, Histolytica	Sewage and activated sludge	Parasitic and pathogenic
		b) Ciliates:		
		Paramoecium, Vorticella, Carchesium, Stentor, Colpidium, Coleps, Euplotes, Colopoda, Bodo	Highly polluted waters, sewage and activated sludge	Bacteria eaters
		c) Crustacea:		
		1) Bosmina, Daphnia	Stagnant polluted waters	Indicators of pollution
		2) Cyclops	Step wells in tropical climate	Carrier host of guinea worm
iii)	Rotifers	a) Rotifers:		
		Anurea, Rotaria, Philodina	Polluted and Algae laden waters	Feed on algae
		b) Flagellates:		
		1) Ceratium, Glenodinium, Peridinium Dinobryon	Rocky strata, iron bearing and acidic waters	Impart colour and fishy taste
		2) Euglena, Phacus	Polluted waters	Impart colour

Sl No.	*Classification of Microscopic Organism*	*Group and Name of the Organism*	*Habitat*	*Effect of the Organisms and Significance*
(1)	(2)	(3)	(4)	(5)
iv)	Miscellaneous Organisms	a) Sponges, Hydra	Fresh water	Clog filters and affect purification systems
		b) Tubifex, Eristalls, Chironomids	Highly polluted waters, sewage and activated sludge and bottom deposits	Clog filters and render water unaesthetic
		c) Plumatella	Polluted waters	Produces biological slimes and causes filter operational difficulties
		c) Dreissena, Asellus	Polluted waters	Harbour pathogenic organisms

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Photographs – Kolleru lake

1. Unused compost making shed at Kokkirayalanka

2. Construction & Demolition waste dump - Gudivakalanka

3. Disposal of municicpal solid waste at Penchikalamarru on Gundugolanu Alapadu Road - Kolleru lake

4. Domestic sewage discharge and Municipal Solid Waste dumping into kolleru lake - Gudivakalanka

5. MSW dump on the banks of Kolleru lake on the road between Kokkirayalanka and Chettunnapadu

6. MSW dumping in the inlet drain, Pandikodu drain, Chinanindru kolanu Village, Nidamarru Mandal, West Godavari District.

7. Muncipal Solid Waste Dump - Gudivakalanka

8. Plastic waste dump on the banks of Kolleru lake at on the road between Kokkirayalanka and Chettunnapadu

9. View of Kolleru lake at Atapaka Bird Sanctuary

10. View of Kolleru lake at Chettunnapadu

11. View of Kolleru lake at China Yedlagadi

12. View of Kolleru lake at Kolleti kota

13. View of Kolleru lake at Kolleti kota

14. View of Kolleru lake at Kolleti kota

15. View of Kolleru lake at Komati lanka

16. View of Kolleru lake at Komati lanka

17. View of Kolleru lake at Pedayedlagadi village

18. View of Kolleru lake at Pedayedlagadi

19. View of the Kolleru lake at Komati lanka

20. Water hycinth growth in Kolleru lake - Gudivakalanka

21. Water hycinth growth on lake water at Pedayedlagadi village.

22. Water hycinth growth on lake water at Pedayedlagadi village

23. Municipal Solid Waste Dumping in the Mondikodu drain at Madhavapuram village.

24. View of Upputeru - Outlet of Kolleru lake on Kaikaluru- Akivedu Highway

25. View of Upputeru - Outlet of Kolleru lake

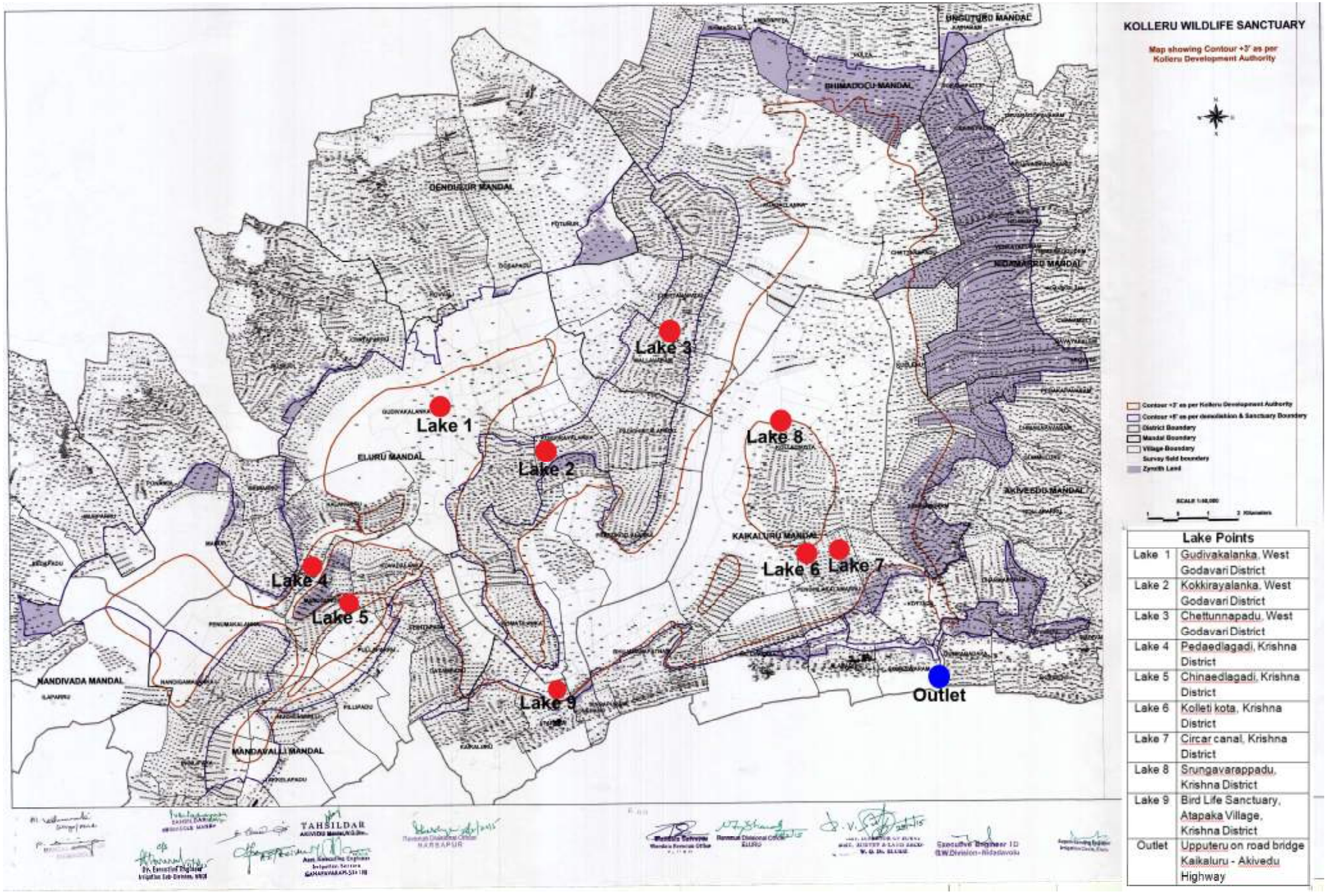
26. Budameru – Domestic sewage discharge at New Rajarajeshwari peta, Vijayawada.

27. Budameru – Domestic sewage discharge & Municipal Solid Waste dumping at Inner Ring Road, Ramavarpadu, Vijayawada

28. Budameru – Domestic sewage discharge at NH 16, Velpuru, Krishna District.

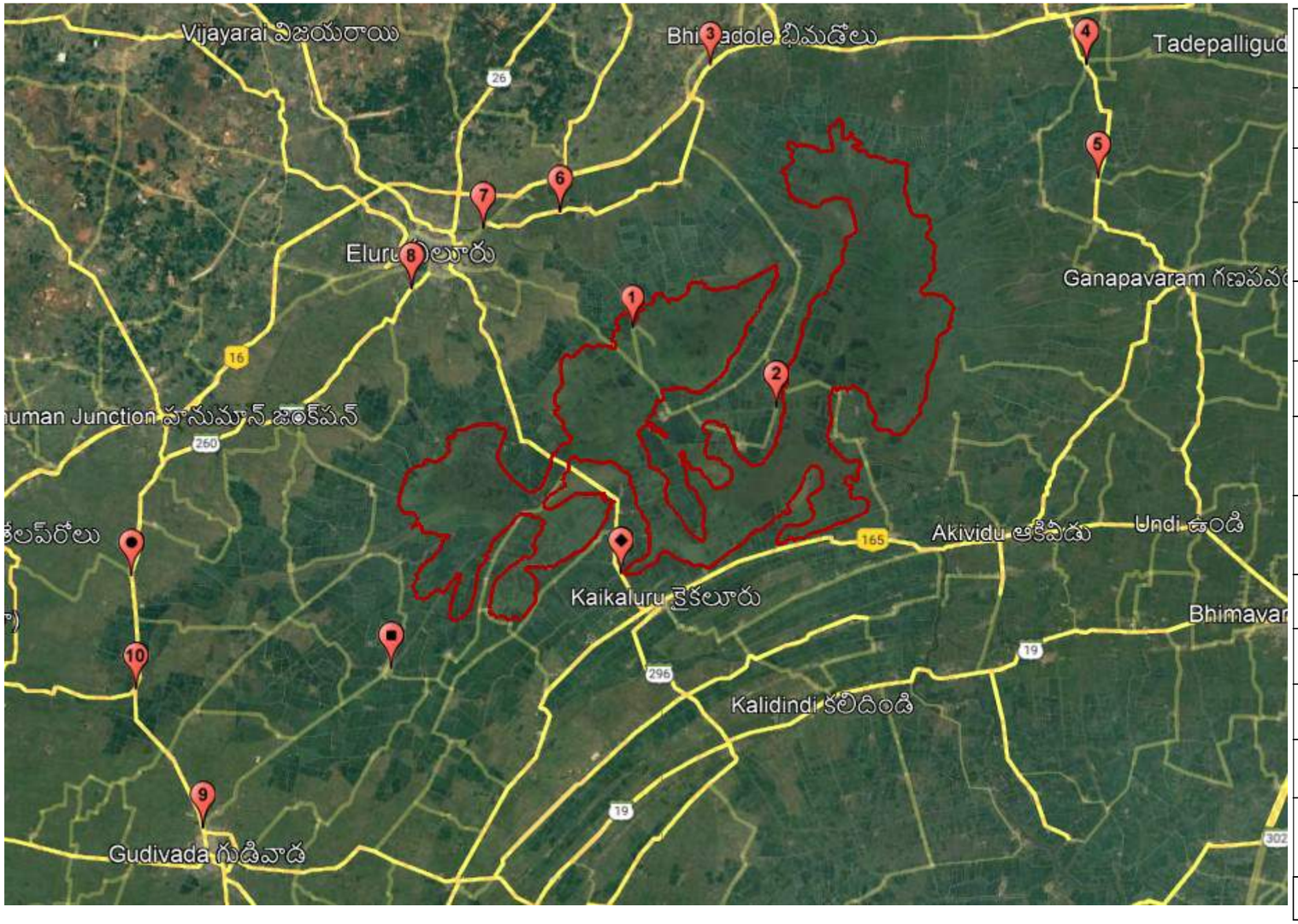
29. Budameru – Domestic sewage discharge at NH 16, Velpuru, Krishna District.

30. Budameru – Domestic sewage discharge on SH 28 – Gudivada to Hanuman Junction Road.



Lake Points	
Lake 1	Gudivakalanka, West Godavari District
Lake 2	Kokkirayalanka, West Godavari District
Lake 3	Chettunnapadu, West Godavari District
Lake 4	Pedaedlagadi, Krishna District
Lake 5	Chinaedlagadi, Krishna District
Lake 6	Kolleti kota, Krishna District
Lake 7	Circar canal, Krishna District
Lake 8	Srungavarappadu, Krishna District
Lake 9	Bird Life Sanctuary, Atapaka Village, Krishna District
Outlet	Upputeru on road bridge Kaikaluru - Akivedu Highway

Kolleru Lake – Map depicting inlet streams / drains



1	Mondikodu Grampachayat, West Godavari District
2	Jodi Kaluva, West Godavari District
3	Bulusuvagu, West Godavari District
4	Tokalapalli drain, West Godavari District
5	Pandikodu drain, West Godavari District
6	Kovvali drain, West Godavari District
7	East Tammileru, West Godavari District
8	West Tammileru, West Godavari District
9	Chandraiah drain, Krishna District
10	Budameru, Krishna District
	Narasannapalem, Krishna District
	Polaraj drain, Krishna District
	Chandraiah drain at Polukonda Village, Krishna District
	Kolleru lake boundary