



KERALA STATE POLLUTION CONTROL BOARD
കേരളസംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡ്

Pattom P.O., Thiruvananthapuram - 695 004
പട്ടം പി.ഒ., തിരുവനന്തപുരം - 695 004

PCB/HO/SEE2/ANNUAL REPORT SWM/2021-22

Dated: 23/08/2022

From

The Member Secretary

To

The Member Secretary
Central Pollution Control Board
Parivesh Bhavan
East Arjun Nagar
New Delhi - 110032



Sub: Annual Report 2021-2022 on implementation of Solid Waste Management Rules, 2016- reg

Ref: Solid Waste Management Rules, 2016

Sir,

Annual Report for the year 2021-2022 as per the provision of 24 (3) of the Solid Waste Management Rules, 2016 is submitted herewith.

Yours faithfully

Steve A J

MEMBER SECRETARY

Encl: As above

Copy to:

1. Regional Director, CPCB, Bangalore
2. All ROs and DOs
3. IT Cell
4. CA to Member Secretary

o/c

Form V

[See rule 24(3)]

Format of annual report to be submitted by the State Pollution Control Board or
Pollution Control Committee to the Central Pollution Control Board

PART A

To,

The Chairman
Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar
DELHI- 110 0032

ANNUAL REPORT '2021 – 2022'

1)	Name of the State/Union territory	Kerala
2)	Name & address of the State Pollution Control	Kerala State Pollution Control Board Plamoodu, Pattom P.O., Thiruvananthapuram, Kerala - 695004
3)	Number of local bodies responsible for management of solid waste in the State/Union territory under these rules	All urban local bodies [93 (6 corporation; 87 Municipality)]
4)	No. of authorization application Received	59
5)	A Summary Statement on progress made by local body in respect of solid waste management	Attached as Annexure I.
6)	A Summary Statement on progress made by local bodies in respect of waste collection, segregation, transportation and disposal	Attached as Annexure II for Urban Local Bodies Annexure II A for Rural Local Bodies
7)	A summary statement on progress made by local bodies in respect of implementation of Schedule II	Attached as Annexure III
8)	Date: 03/09/2021 Place: Thiruvananthapuram	Chairman or Member Secretary State Pollution Control Board/ Pollution Control Committee

PART B

Towns/cities:

Total number of Town's/ Cities: **6 Corporations & 87 Municipalities**

Total number of ULBs: **93**

Number of class I & class II cities/towns: **Class I- 16; Class II- 23**

Authorization status (names/number)

Number of applications received: **59**

Number of authorizations granted: **51**

Authorizations under scrutiny: **7**

Solid waste generation status:

Solid waste generation in the state (TPD): **3472 TPD**

Collected: **1283 TPD**

Treated: **2691 TPD**

Land filled:

Compliance to Schedule I of SWM Rules (Number/names of towns/capacity)

Good practices in cities/towns: House-to-house collection:

Segregation:

Storage

Covered transportation

Windrow composting, Vermi composting, aerobin, biogas plants, kitchen bins, bio composter, Biobins, pipe compost, ring compost, compost pits, Material Collection facilities, Resource. Material collection and recovery facilities are provided. (Details attached as **Annexure I for Urban Local Bodies**).

Processing of SW (Number/names of towns/capacity) Solid Waste processing facilities setup:

Sl.No.	Composting	Vermi-composting	Biogas	RDF/Pelletization
1	Centralised windrow composting plants - 2(Large); 12(Small)	Community level-7	Community level-287, Household level-21,560	Nil
2	Community level-906 (aerobin, Biobins)			
3	Household level- 432643			

Processing facility operational

Sl.No.	Composting	Vermi composting	Biogas	RDF/Pelletization
1	Centralised windrow composting plants - 2(Large); 12(Small)	Community level-7	Community level-287, Household level-21,560	Nil
2	Community level- 906 (aerobin, Biobins)			
3	Household level- 432643			

Processing facility under installation/planned:

Sl. No.	Composting	Vermi-composting	Biogas	RDF/Pelletisation
1	Being planned/ installation for decentralized units		Being planned/installation for decentralized units	

Waste-to-Energy Plants: (Number/names of towns/capacity)

Sl.No.	Plant Location	Status of operation	Power Generation (MW)	Remarks
1	Thiruvananthapuram	Land not Identified		
2	Kollam	Work awarded 104000 m3 legacy wastes removed. Biomining completed	8.165 T/D of CBG	
3	Kochi	Retendering completed		
4	Munnar	Tendering		
5	Thrissur	Land identified		
6	Palakkad	Work awarded	4018.kg/day of CBG	DPR stage
7	Malappuram	Land identified		
8	Kozhikode	Work awarded – Construction to be started Clearance obtained. Power Purchase agreement will be executed	6 Mega watt electricity	Construction to be started by August Biomining is being done
9	Kannur	Work awarded		DPR stage

Disposal of solid waste (number/names of towns/capacity):

Landfill sites identified: 1 (One at the regional level at Ernakulum)

Landfill constructed: Nil

Landfill under construction: 1 (Attingal Municipality)

Landfill in operation: Nil

Landfill exhausted: Nil

Land filled capped: Nil

Solid Waste Dumpsites (number/names of towns/capacity): (list enclosed)
Annexure: IA

Total number of existing dumpsites: **35**

Dumpsites reclaimed/capped: **6**

Dumpsites converted to sanitary landfill: **Nil**

Monitoring at Waste processing/Landfills sites:

Sl.No.	Name of facilities	Ambient air	Groundwater	Leachate quality	Compost quality	VOCs
1.	Windrow composting plant, Kochi		Analysis Report attached as Annexure III	Analysis Report attached as Annexure III		
2.	Windrow Composting Plant, Brahmapuram		Analysis Report attached as Annexure III	Analysis Report attached as Annexure III		

Status of Action Plan prepared by Municipalities:

Total number of Corporations/municipalities: **93**

Number of Action Plan submitted: All urban local bodies had submitted solid waste management action plan.

ANNEXURE I

SUMMARY STATEMENT ON PROGRESS MADE BY LOCALBODY IN RESPECT OF SOLID WASTE MANAGEMENT

The Government of Kerala has taken efforts to implement the Solid Waste Management Rules, 2016 in the State. There are 6 Corporations, 87 Municipalities and 941 GPs in the State. The Kerala State Pollution Control Board (KSPSCB) issued repeated directions to all local bodies to ensure compliance of the Solid Waste Management Rules, 2016. 3472 TPD of solid waste is generated from the cities and towns. The status of the present facilities is given below:

FACILITY	TYPE OF PLANT	NUMBER	DETAILS	QUANTITY
Centralised plant	Windrow composting plants (large)	2	1. Emakulam (300 TPD) 2. Kozhikode (100 TPD)	400 TPD
	Windrow composting plant (Small)	12	1. Attingal (13 TPD) 2. North Paravur (3 TPD) 3. Chalakkudy (2 TPD) 4. Kodungallur (4 TPD) 5. Kothamangalam 6. Kunnamkulam 7. Guruvayoor (2 TPD) 8. Chittur- Thathamangalam (4 TPD) 9. Ottappalam (5 TPD) 10. Palakkad (4 TPD) 11. Thaliparambun 12. Payyannur	37 TPD
Community Level	Vermicomposting plants (Small)	7	1. Attingal (0.25 TPD) 2. Thodupuzha 3. North Paravur (1 TPD) 4. Chavakkad (1.5 TPD) 5. Manjeri (0.5 TPD) 6. Koothuparambu 7. Mattannur (5 TPD)	8.25 TPD
	Aerobins	406 (10 kg)	4060 kg (4.060 TPD)	4.060 TPD
	Biogas plants	287 (2.5 kg)	717.5 kg (0.7175 TPD)	1 TPD
	Biobins in flats	500 (1 ton)	Thiruvananthapuram, Kollam, Emakulam, Trissur Kozhikode	500 TPD
	Material Collection Facility	685 (0.25 ton)		171.25 TPD
	Resource recovery facility	77		50 TPD
	Household Level	Pipe compost (1 Kg)	1,31,570	131570 kg
Kitchen bin (1 Kg)		79,160	79160 kg	
Biogas plant (2.5 Kg)		21,560	53900 kg	
Biocomposter, Biobins, potbin (1 Kg)		1,09,455	109455 kg	
Ring compost (1 Kg)		40,050	40050 kg	
Bucket compost (1 Kg)		6,913	6913 kg	
Compost pit (2 Kg)		43,935	87870 kg	
Institutional level	Biogas plants, aerobins, biobins	1000 (0.5 ton)		500 TPD

Renderingplant	Renderingplant	26units	250TPD	250TPD
Steelmills	Scraprecycling	18units		50 TPD
Plastic recyclin gunits	Plasticrecyclingunits	187units	200TPD	200 TP D
Road tarring	Usedforroadconstructio nbyPWDandLSGD		10TPD	10 TPD
TOTAL				2690.478 TPD

Treated: 2691TPD

The above table is prepared based on the details, so far obtained from local bodies.

The Government of Kerala constituted a State Level Advisory Committee on Waste Management chaired by the Chief Secretary; this Committee has conducted 36 meetings, till date, for monitoring solid waste management on monthly basis. The Government has accorded sanction for establishing Waste to Energy plants in 8 cities having 1 lakh or more population and in two local bodies having population below 1 lakh. The progress is given below:

STATUS OF SETTING UP OF WASTE to ENERGY PLANT

Sl. No.	Waste to Energy plant	Land Identified	Procured	Status
1	Kozhikode Njaliyanparambu	Kozhikode corporation	(Govt.land) 12.67 acre at Njaliyanparambu	<ul style="list-style-type: none"> • Work awarded to Zonta Infratech Private Limited for the construction of Waste to Energy Plant. • Consent to establish was issued to Malabar Waste Management Private Limited on 12-8-2020 with a validity upto 30-6-2023 for the generation of 6MW electricity and 20T of compost. • Biomining of legacy waste is 50% complete. The total area for biomining is 1.8 acres. • All licenses from the corresponding departments were obtained for the construction of waste to energy plant. Work will be started only after monsoon.
2	Kannur Chelora	Kannur Corporation	(Govt.Land) 9.7 acres at Chelora	<ul style="list-style-type: none"> • Work of WtE plant can be started only after the work of biomining is carried out. WtE plant is proposed in 9.7 acres of land after clearing the legacy waste. • Tendering completed and DPR prepared by Blue planet. Consent application is yet to be received. • For biomining, volume of legacy waste – 1, 22,844 m³ (NIT). First given to Zonta and they asked to revise the amount of biomining. Again retendered and identified a suitable contractor, Jan-Adhar Sevabhavi Sanstha. Agreement to be executed • Waste characterization done on 18-4-2020. Six samples taken-10kg from upper and lower part at three locations- 50-70% inert, 15-25% recoverable- 12-18% organic compost. Cu in one sample, chromium in three and lead in four exceeded. Capping can be considered for maximum 10% residual rejects after biomining of stabilized waste.

3.	Palakkad Kanjikode	Palakkad Municipality	Land taken over from Kerala State Electricity Board Ltd. in advance possession 15 acres at Kanjikode	<ul style="list-style-type: none"> • Blue Planet Palakkad Waste Solutions Private Limited was formed to take up the development of the project. • Consent to establish was issued on 21-12-2021 to the project with a validity upto 30-11-2023. • 200T of municipal solid waste will be processed. The products include 4018kg/day of compressed biogas; 60TPD of RDF; 6 TPD of recyclables; 12 TPD of waste for sanitary landfills; 35.75 TPD of dry organic compost/manure
4	Kollam Kureepuzha	Kollam Corporation	7.05 acres at kureepuzha (Govt.land)	<ul style="list-style-type: none"> • The SPV constituted for setting up of the Waste to Energy Plant of Kollam Corporation, • M/s. Venad Waste Management Private Limited had applied for Consent to Establish on 09.09.2021. The proposed waste to energy plant is bio methanation based and is having a capacity of 200 TPD. • Consent to establish was issued to project on 10-1-2022 with a validity upto 9-1-2025 for the production of 8.165TPD of compressed biogas from 200TPD of municipal solid wastes • Biomining of legacy waste is 50% complete.
5	Ernakulam Brahmapuram	Kochi corporation	20 acres at Brahmapuram (Govt. land)	<ul style="list-style-type: none"> • Bio mining of legacy waste started on February first week by M/s Zonta Infratech Ltd. They have completed biomining of four sectors out of seven sectors. • For construction of Waste to Energy plant, work order was issued to M/s. Zonta Infratech. Based on the technical meeting held on 03.01.2022 by the Principal Secretary LSGD, representatives from M/s. Zonta Infratech informed that steps have been taken to transport the machineries from Delhi and Pune.
6	Idukki Munnar	Idukki Municipality	2 acres of land at Munnar	<ul style="list-style-type: none"> • Bio mining of legacy waste is going on and the authorities informed that it will be expected to complete before monsoon. • The committee observed that the Consortium is meeting the technical

				<p>and financial legibility Criteria.</p> <ul style="list-style-type: none"> • The consortium made a detailed presentation of their technical plan before the Bid evaluation Committee. • SLAC after detailed discussion resolved to accord sanction to proceed with the financial evaluation of the Bid
7	Thrissur	Thrissur corporation	Identified land at Ollookkara village	<ul style="list-style-type: none"> • Thrissur Corporation identified land at Ollookkara village in Thrissur district. • Vide GO(Rt)No111/2020/LSGD dated 13/01/2020 State Government has accorded sanction to Thrissur Municipal Corporation to purchase the identified land at Ollookkara Village in Thrissur district and to hand over the same on lease basis to KSIDC for the development of the project • Secretary, Thrissur Municipal Corporation to report the status of price negotiation done with the owners of the land identified.
8	Malappuram	Malappuram munciplaity	8.09 acres of land at Kurumbathoor village in Tirur Taluk	<ul style="list-style-type: none"> • 8.09 acres of land identified by District Administration at Kurumbathur village. Tirur taluk forsetting up of WtE plant. The land is under possession of KSIDC. Details of this are reported to be submitted to Government already by LR Deputy Collector. Not submitted any application to the Board.
9.	Thiruvananthapuram	Thiruvananthapuram Corporation		<ul style="list-style-type: none"> • Land is not yet identified

The progress achieved is as follows:

- Setting of Waste to energy plants at 9 locations is at various stages
- **Strict action has been initiated for implementation of Single use plastic** all over the State.

SUP Action Plan is being approved by the State Task Force. Registration for PIBOs and PWPs as per schedule II of PWM rule, 2016 being issued.

- For **Regional Sanitary Landfill**, land (25 acre) has been identified at site of FACT at Ambalamedu, Ernakulam and action is being taken for takeover.
- **Biomining** started at Njalianparmbu dumpsite and work completed at Kureepuzha Kollam. Tendering stage at Kottayam, Bhramapuam, Chelora.

Annexure - IA
DUMPSITES IN KERALA AS ON MAY 2022

SI No:	Location	District	Present Status as on April 2022
1	Vilappilshala	Thiruvanthapuram	Central facility was closed on 21-12-2011 due to protest. The site is unapproachable due to thick bushes and trees.
2	Kureepuzha	Kollam	Biomining is completed. 104.00 Metric T of legacy waste has been processed. On 24-01-2022, 85 T of RDF has been send to cement factories.
3	Kottayam Vadavathoor	Kottayam	DPR prepared for world bank aid. Rs. 23.22 Crore Also submitted proposal to SBM
4	Sarvodayapuram	Alappuzha	Initially volume of waste was quantified as 27000 tonnes. and an amount of Rs. 3.1 crores was estimated. Later it was re quantified as 30000 m3 .Due to increase in volume of waste; an estimate was revised to Rs, 3.69 Crores and sent for Technical Sanction from State Mission. The State mission returned the same stating that T.S has to be issued from Municipality itself.
5	Brahmapuram	Ernakulam	Agreement executed with Zonta Zonta Infratech Pvt Ltd. Biomining started. Three sectors out of seven sectors completed. RDF -30 Tones stored in sit has already sent to cement plant by the end of April 2022
6	Laloor	Thrissur	Some area is reclaimed and construction of stadium is progressing and remaining area is taken up for biomining with Clean Kerala mission and KEIL. Proposal is under consideration of Suchitwa Mission.
7	BPL Koottupatha, Palakkad	Palakkad	Under Consideration DPR Submitted and requested for financial Assistance due to lack of Municipal Fund
8	Njeliyamparambu, Calicut	Kozhikode	Biomining is progressing In Zone 1, capping of 47000 m3 completed and rest will be commenced in January. For Zone 2 and Zone 3, biomining is to be done, which has been delayed due to incessant rains as well as to get clarification regarding

			zone change from PCB.
9	Chelora	Kannur	Biomining is proposed for the legacy waste of 1,23,822 m ³ in 9.75 acres of land at Chelora, Kannur. A contractor was identified by KSIDC but the Corporation and the Contractor had disputes on the quantity and terms of engagement. Kannur Corporation has retendered the project and has identified a suitable contractor (m/s Jan-Adhar Sevabhavi saristha) to remove the legacy waste dumped at the site. Agreement to be executed by, as informed by the Corporation.
10	Thalassery	Kannur	No action reported

Other Dumpsite locations

SI No:	Location	District	Present Status as on 18-4-2022
1	Attingal	Thiruvanthapuram	Biomining started
2	Varkala	Thiruvanthapuram	Total legacy waste 437 ton estimated 247 ton legacy waste removed balance 190 ton legacy waste clearance ongoing.
3	Changanassery, Fathimapuram	Kottayam	Project worth 13.5 Lakh completed. 20 lakh project to be implemented soon. Project for bioremediation and under consideration in Suchitwa Mission.
4	Erattupetta-Thevarrapara	Kottayam	As per the direction of Principal Secretary a meeting was conducted with Suchitwa Mission District C-ordinator in the presence of Honorable MLA Adv. Sebastian Kulathunkal on 07/12/21. In this meeting the Suchitwa Mission. Co-ordinator informed that the tender process will be completed before 14/12/2021. But didn't tender till now.
5	Mundakkayam – Vettukallamkuzhy	Kottayam	Currently, the dumping yard was washed away in the 2021 landslide
6	Thodupuzha	Idukki	Direction issued to the local body for bio mining, but not action has been initiated by the local body.
7	Munnar	Idukki	Bio mining is in progress, 80% of biomining is completed
8	Kattapana-Puliyamala	Idukki	Direction issued to the local body for bio mining, but not action has been initiated by the local body.
9	Kothamangalam	Ernakulam	DPR submitted for council resolution. Council resolution pending due to lack of own fund

10	Muvattupuzha	Ernakulam	Biomining is to be initiated
11	North Paravoor	Ernakulam	The estimated quantity of legacy waste is 18867m ³ . Request has been submitted to Kerala Solid waste management for disposal of legacy waste.
12	Chavakkad	Thrissur	Total Quantity of legacy waste is 4200 Cubic Meter as per Total Station report. Dump site has not been working since 2011.
13	Chalakkudy	Thrissur	Appointed IRTC to submit the report on DPR prepared by SEUF.
14	Irijalakuda-Kuthuparamba	Thrissur	Windrow compost Plant (4 ton) and MCF Completed, 5 cents Pachathuruth maintained, 1.5 acre bufferzone teak plantation maintained. 30 cents remains to reclaim. Proposal under consideration of Suchitwa Mission - KSWMP Project
15	kurukkanpara, kunnamkulam	Thrissur	Dumpsite presently not using as dumping waste. biowaste management plant and non-bio-waste management facilities like MCF, MRF, RRF are functioning at the dumpsite area
16	Kumbalangad, Wadakkancherry	Thrissur	Biomining project for this site is undertaken as part of SBM Urban DPR. A DPC project on the same is also approved for 30 lakhs Invited EOI
17	Ottapalam	Palakkad	Tendered and placed before council for approval
18	Karathodu-Puliyettummam	Malappuram	On Process
19	Manjeri	Malappuram	The file put up to council for approval to

			remove the legacy waste
20	Thirur - Pottilathara Trenching ground	Malappuram	No issues & waste segregated and stored and not polluted the environment
21	Vadakara, Puthiyapp	Kozhikode	Capping done over a part of legacy waste
22	Kalpetta	Wayanad	Agreement has been entered into with Clean Kerala Company for disposal of non-hazardous waste including legacy waste. The waste is segregated and stored in a manner that does not pollute the environment.
23	Koothuparamba	Kannur	Capping done .Quantification work is going on.
24	Kanjangad, Chemmatamvayal	Kasargod	The waste is segregated and stored in a manner that does not pollute the environment
25	Vidyanager, Kasargod	Kasargod	The waste is segregated and stored in a manner that does not pollute the environment

ANNEXURE III



KERALA STATE POLLUTION CONTROL BOARD CENTRAL LABORATORY

കേരള സംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡ്
കേന്ദ്ര പരിഷ്കരണശാല



Certificate No.
TC-8525

ANALYSIS REPORT

Analysis Report No.	PCB/CL/1455/20-21	Date	12 Oct 2021	Doc No: PCB/CL/CH/F-7
Ref.No.	PCB/EKM/DG 2/IQR-12/2012 dated for 03.202	Date Of Collection	06 Mar 2021	
Received From	D.O Perumbavoor	Date Of Receipt	06 Mar 2021	
No. Of Sample	1	Period Of Analysis	06 Mar 2021 - 12 Oct 2021	
Source	Brahmapuram solid waste processing area	Scientist-in-charge	Rajeena	
Sample Condition	fit for analysis	Sample Type	Waste Water	
Sample collected by	EE, DO Perumbavoor	Sample volume & container type	2L Plastic can	
Sample preservation	As per APHA/ IS 3025(Part-1)	Type of test	CHEMICAL	
Sampling Point	Leachate collection pit			

Sample ID : PCB 20

Sl No	Parameters	Unit	Value	Test Method	Detection Limit
1	pH	-	7.62	APHA, 4500- H + B, 4-95 to 4-99, 23rd Edition : 2017	1
2	Suspended Solids	mg/L	1210	APHA, 2540- D, 2-70 to 2-71, 23rd Edition: 2017	10 mg/L
3	Total Dissolved Solids	mg/L	22857	APHA, 2540- C, 2-69 to 2-70, 23rd Edition 2017	10 mg/L
4	Chloride	mg/L	5104.8	APHA, 4500- Cl / B, 4-75 to 4-76, 23rd Edition: 2017	1 mg/L
5	Fluoride	mg/L	0.1	APHA, 4500- F C, 4-89 to 4-90, 23rd Edition (Ion Selective Electrode Method): 2017	0.1 mg/L
6	Ammonia as Nitrogen	mg/L	224.0	APHA, 4500 NH3 F, 4-119 to 4-120. (Phenate method, Colourimetric), 23rd Edition: 2017	0.02 mg/L
7	Biochemical Oxygen Demand (BOD)	mg/L	11960.0	IS 3025 (Part 44): 1993	0.1 mg/L

GANDHI NAGAR, KOCHI - 682 020 ഗാന്ധിനഗർ, കൊച്ചി - 682020
Telephone Nos. Direct: 0484 - 220 7781, EPABX: 0484 220 7783 - 86, Fax: 0484 - 220 7781
E Mail: kspcbctekm@gmail.com Web : www.keralapcb.nic.in



8	Chemical Oxygen Demand (COD)	mg/L	12960.0	APHA, 5220 B, 5-18 to 5-19, 23rd Edition:2017	3 mg/L
9	Total Kjeldahl Nitrogen	mg/L	229.6	APHA, 4500-N org B, 4-139 to 4-140, 23rd Edition: 2017	0.2 mg/L
10	Phenolic compounds	mg/l	0.96	APHA 5530-C, 22nd Edition	0.001mg/l
11	Cyanides	mg/L	BDL	APHA, 3111-B	0.01 mg/L
12	Cadmium	mg/L	BDL	APHA, 3111-B, 3-20 to 3-21, 23rd Edition : 2017	0.01 mg/L
13	Chromium Total	mg/L	0.07	APHA, 3111-B, 3-20 to 3-21, 23rd Edition:2017	0.03 mg/L
14	Copper	mg/L	0.14	APHA, 3111-B, 3-20 to 3-21, 23rd Edition : 2017	0.02 mg/L
15	Nickel	mg/L	0.22	APHA, 3111-B, 3-20 to 3-21, 23rd Edition : 2017	0.05 mg/L
16	Lead	mg/L	0.34	APHA, 3111-B, 3-20 to 3-21, 23rd Edition : 2017	0.05 mg/L
17	Zinc	mg/L	0.17	APHA, 3111-B, 3-20 to 3-21, 23rd Edition : 2017	0.02 mg/L
18	Arsenic	mg/L	0.04	APHA, 3114-B, 3-36 to 3-40, 23rd Edition:2017	0.01 mg/L
19	Mercury	mg/L	0.01	APHA, 3112-B, 3-26 to 3-27, 23rd Edition:2017	0.01 mg/L

- End of Report -

Checked by

Rajeeena R
12/10/21

RAJEEENA. R

Environmental Scientist

Authorised by

Dr. Jose Maria

Dr. JOSE MARIA
Environmental Scientist
Central Laboratory

Kerala State Pollution Control Board
Gandhi Nagar, Kochi-20

Note: The test results relate only to the sample submitted for analysis and it shouldn't be reproduced except in written permission of the authorised signatory of the lab.

GANDHI NAGAR, KOCHI - 682 020

ഗാന്ധിനഗർ, കൊച്ചി - 682020

Telephone Nos. Direct: 0484 - 220 7781, EPABX: 0484 220 7783 - 86, Fax: 0484 - 220 7781

E Mail: kspcbclcm@gmail.com Web : www.keralapcb.nic.in

Certified for OHSMS (ISO 45001:2018)



0001

KERALA STATE POLLUTION CONTROL BOARD
CENTRAL LABORATORY, KOCHI-682020

FORM-II
REPORT OF THE BOARD ANALYST
(See rule 27)

Report No. PCB/CL/LEGAL/ES II/2019

Dated 18th August, 2021

I hereby certify that, I V.T. Sajimon, Board analyst, duly appointed under subsection (3) of section 53 of the water (prevention and control of pollution) act 1974 (act 6 of 1974) received at 02:05 pm on 28.07.2021 from the Environmental Engineer, Kerala State Pollution Control Board, District Office-2, Perumbavoor, Ernakulam. One sample of effluent Bottle No PCB/DO2-EKM/L1 collected by Assistant Environmental Engineer, Kerala State Pollution Control Board, District Office-2, Ernakulam at 12:15 pm on 28.07.2021 from an authorised discharge point near the leachate collection tank of solid waste treatment plant of Kochi Corporation located at Brahmapuram. The sample was in a condition fit for analysis as reported below.

I further certify that I have analysed the aforementioned samples from 05.08.2021 to 11.08.2021 and declare the result of analysis to be as follows:-

Sl. No.	Parameter	Unit	Values	Method of Analysis	Limits of Detection
1	p ^H	-	8.2	APHA, 4500-H+B, 23 rd Ed., 2017	
2	BOD (3 Days at 27 °C)	mg/l	430	IS 3025 part 44 1993	
3	COD	mg/l	1136	APHA, 5220- B, 23 rd Ed., 2017	0.1mg/l to 10000mg/l
4	Total Suspended Solids	mg/l	102.8	APHA, 2540-D	10mg/l to 10000 mg/l
5	Total Dissolved Solids	mg/l	4134	APHA, 2540-C, 2-69 TO 2-70, 23 rd Edn 2017	10mg/l to 50000 mg/l
6	Ammonia as Nitrogen	mg/l	925.1	APHA - 4500 NH ₃ - B&C4-114 to 4-116, 23 rd Edition, 2017	5mg/l to 5000mg/l
7	Chloride	mg/l	913.2	APHA-4500-cl/B, 4-75 to 4-76, 23 rd Edition; 2017	1mg/l to 100000mg/l
8	Fluoride	mg/l	1.9	APHA-4500-FC, 4-90 to 4-91, 23 rd Ed. (SPADANS Method)	0.01mg/l to

9	Total Kjeldal Nitrogen	mg/l	970	APHA, 4500-N Org B, 23 rd Ed., 2017	0.2mg/l to 5mg/l
10	Phenolic Compound	mg/l	BDL	APHA 5530-C, 22 nd Ed.	0.001 mg/l to 10 mg/l

The condition of the seals, fastening and containers on receipt was as follows:-

The samples was contained in amber coloured 2.5 litre Glass bottle for general parameter, were securely sealed with sealing wax. There was no leak. The impression on the seals and on the attached tags were representative of the Kerala State Pollution control Board.

The seal were opened by me just before analysis.

Signed this 18th August, 2021.



[Handwritten Signature]
Board Analyst

Address:-

V. T. Sajimon,
Chief Environmental Scientist,
Central Laboratory
Kerala State Pollution control Board,
Gandhi Nagar, Kochi-20

To

The Member Secretary,
Kerala State Pollution control Board,
Pattom Palace P.O.,
Thiruvananthapuram-695004.

Copy to:

Environmental Engineer,
Kerala State Pollution Control Board,
✓ District Office-2, Perumbavoor, Ernakulam

KERALA STATE POLLUTION CONTROL BOARD
CENTRAL LABORATORY, KOCHI - 682 020

FORM-II
REPORT OF THE BOARD ANALYST
 (Sec rule 27)

Report No. PCB/CL/LEGAL/ES11/2019

Dated 19th March, 2021

I hereby certify that, P. Geetha, Board analyst, duly appointed under subsection (3) of section 53 of the water (prevention and control of pollution) act 1974 (act 6 of 1974), received at 4:00 pm on 06.03.2021 from the Environmental Engineer, Kerala State Pollution Control Board, District Office-11, Perumbavoor two samples of effluent Bottle No PCB/DO2/LS-1 and PCB/DO2/LS-2 collected by Smt. Rameena V.V, Assistant Environmental Engineer, Kerala State Pollution Control Board, District Office-2, Perumbavoor, Ernakulam at 12:30 pm on 06.03.2021 from the Septage Treatment Plant of Kochi Corporation at Brahmapuram. The sample was in a condition fit for analysis as reported below.

I further certify that I have analysed the aforementioned samples on 09.03.2021 to 19.03.2021 and declare the result of the analysis to be as follows:

Sl. No.	Parameter	Unit	Values	Method of Analysis
1	p ^H	-	6.8	APHA, 4500-H-B, 4-95 to 4-99, 23 rd Ed, 2017
2	BOD(3Days at 27 °C)	mg/l	135	IS 3025 part 44 1993
3	Oil and Grease	mg/l	BDL	APHA, 5520-B, 5-42 to 5-44, 23 rd Ed, 2017
4	COD	mg/l	448	APHA, 5520-B, 23 rd Ed
5	Nitrate as Nitrogen	mg/l	7.4	APHA, 4500NO ₃ -B, 4-127, 23 rd Edition (Ultraviolet Spectrophotometric Method) 2017
6	Phosphates	mg/l	36.67	APHA, 4500P, E, 4-164 to 4-165, 23 rd Edition, 2017
7	Sulphates	mg/l	63.1	APHA, 4500-SO ₄ 2-E, 23 rd Ed., 2017
8	Free Ammonia	mg/l	0.75	GEMS OPERATIONAL GUIDE WHO
9	Total Kjeldhal Nitrogen	mg/l	114.2	APHA, 4500-N Org B, 23 rd Ed., 2017
10	Total Coliform	CFU/100ml	620000	APHA, 4500-N Org B, 23 rd Ed., 2017

11	Faecal Coliform	CFU/100ml	480000	APHA 9222 D, 23 rd Ed.2017
12	Faecal Streptococci	CFU/100ml	1000	APHA 9230 C, 9-119 to 9-122, 23 rd Ed.2017
13	Ammoniacal Nitrogen	mg/l	94.0	APHA.4500 NH3 F,4-119 TO 4-120 Phenate method, Colourimetric, 23 rd Edition.2017

The condition of the seals, fastening and containers on receipt was as follows:

The sample was contained in brown coloured 2.5 litre for general parameter and 1L Glass bottles for Oil & Grease, 300ml sterilized BOD bottle for Microbiology analysis securely sealed with sealing wax. There was no leak. The impression both on the seals and on the attached tags were representative of the Kerala State Pollution control Board. The impressions of each party on the seal and the tag were identical. The tag contained the signature of

Sri. Prasannan.C, Health Inspector, Brahmapuram MSW plant, Kochi Corporation.

The seals were opened by us just before analysis.

Signed this 10th March, 2021.



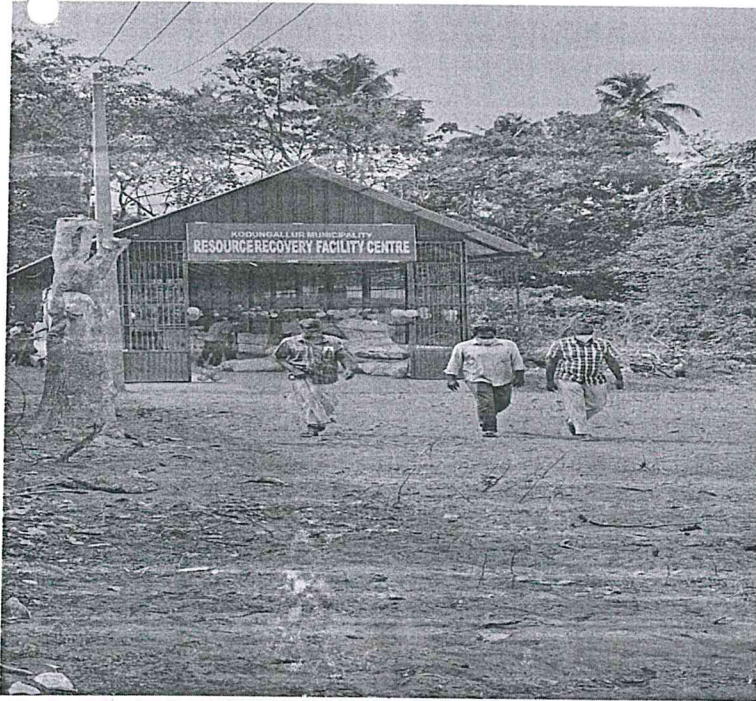
[Signature]
Board Analyst

Address: P. Geetha,
Environmental Scientist (HG)
Central Laboratory
Kerala State Pollution control Board,
Gandhi Nagar, Kochi - 20

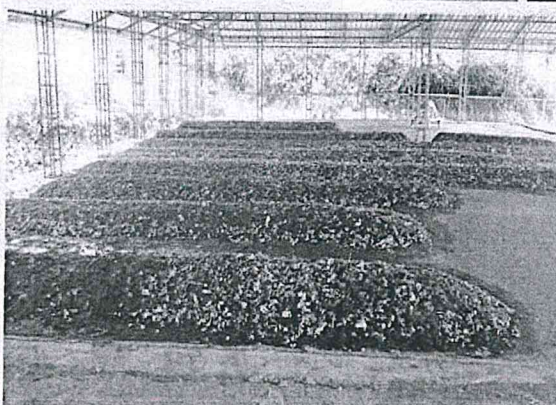
To: The Member Secretary,
Kerala State Pollution control Board,
Pattom Palace P.O.,
Thiruvananthapuram - 695 004.

Copy to: The Chief Executive Officer,

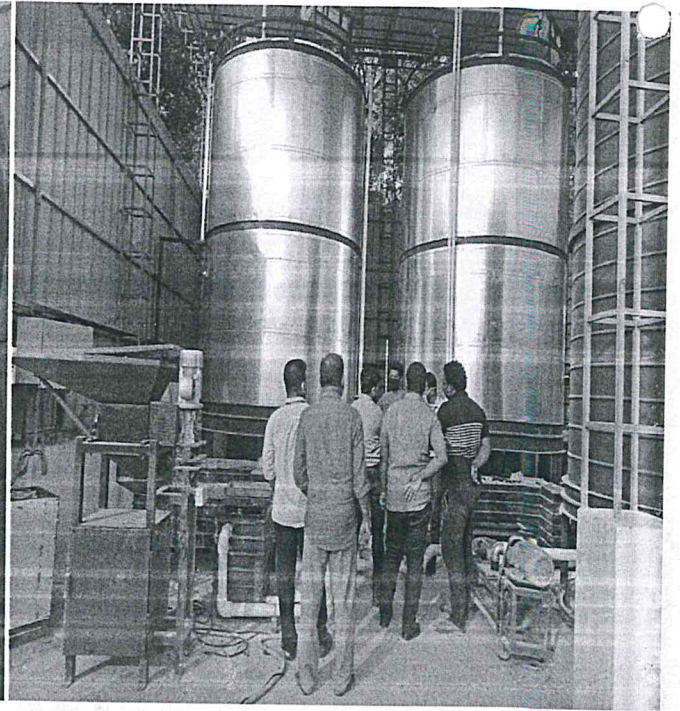
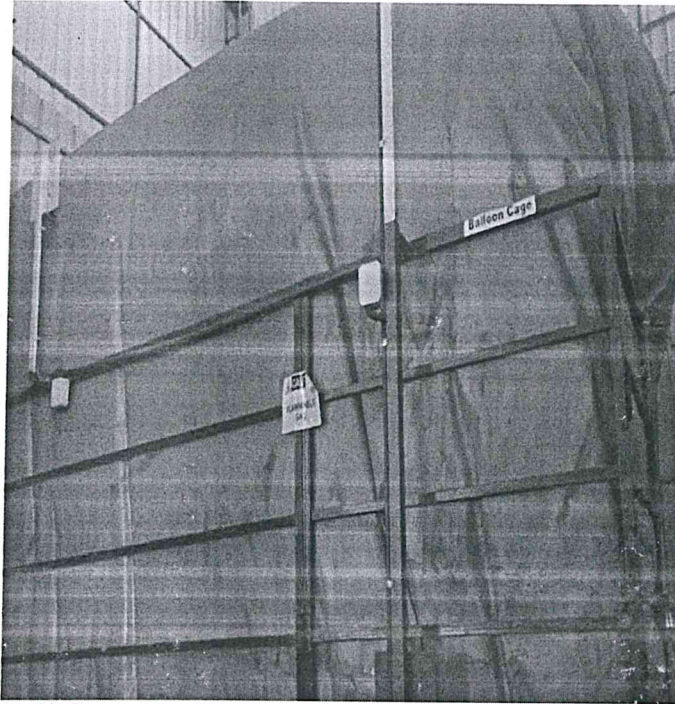
Non biodegradable waste management facilities



Biodegradable waste management



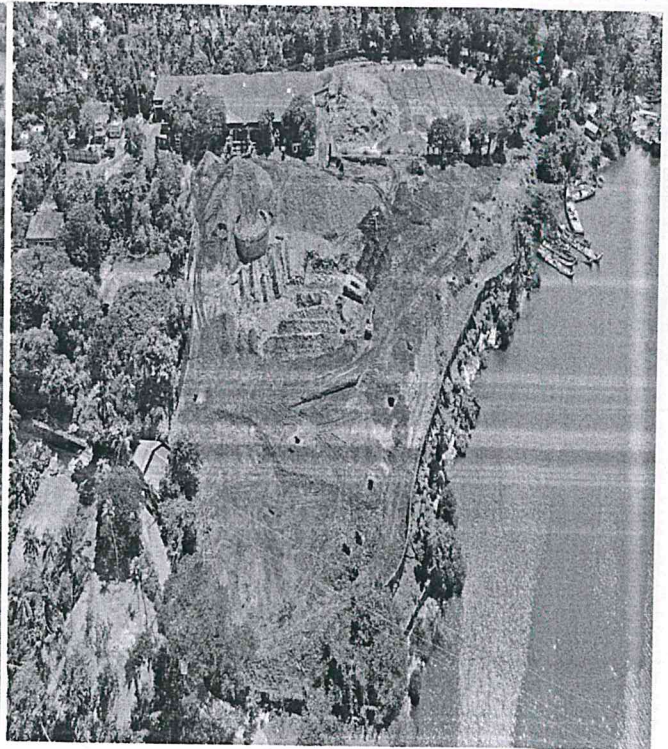
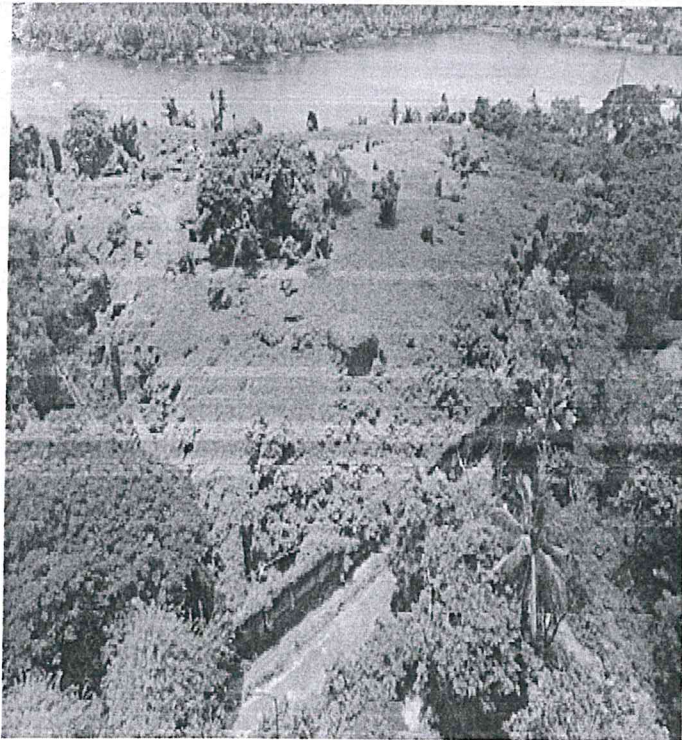
Perinthalmanna Biogas plant



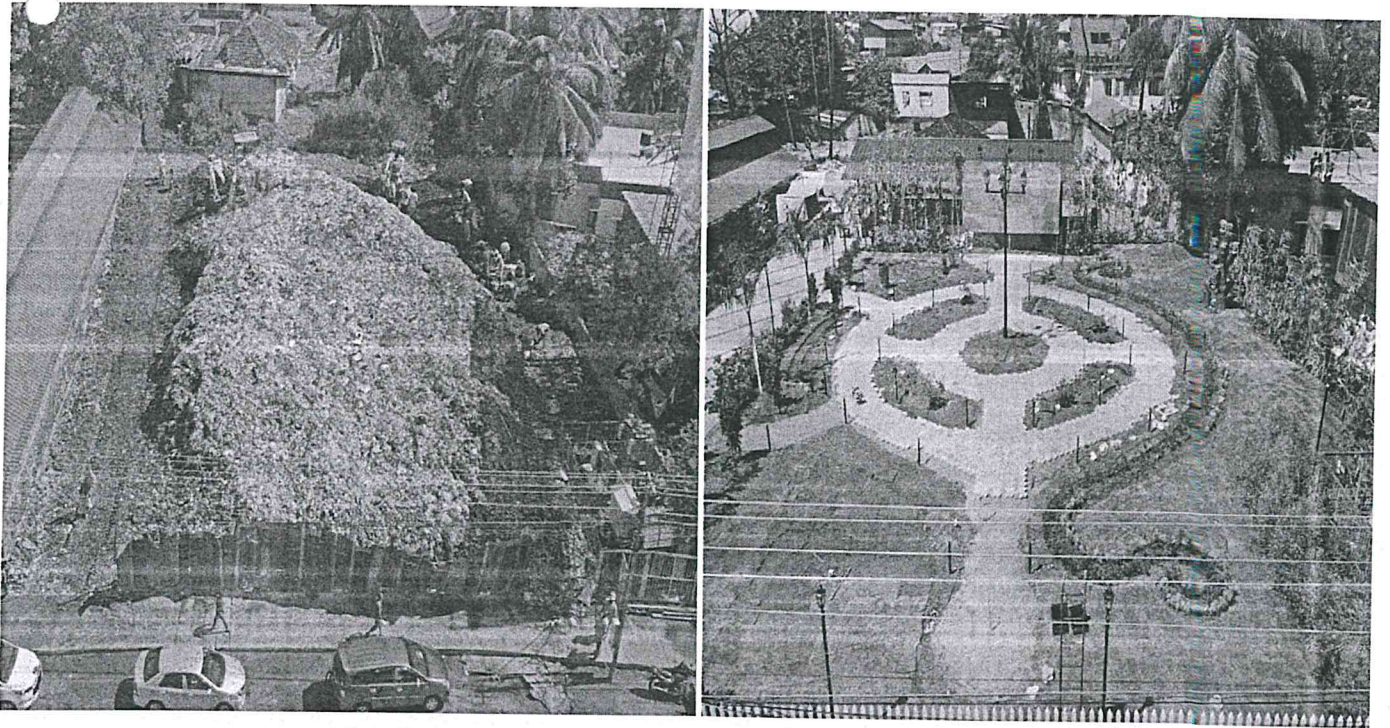
Legacy waste management

BEFORE

AFTER



Trivandrum Corporation – Erumakkuzhy



Glimpses of waste management PPT link:

<https://docs.google.com/presentation/d/1iv3bmP1oYIQmwZMA3yMGGQmhmiii9tPNYnjQ9N660IU/edit?usp=drivesdk>

