

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
SOUTHERN BENCH, CHENNAI
ORIGINAL APPLICATION NO. 27 OF 2021 (SZ)

Tribunal on its own motion

Suo Motu based on the news

item in The Hindu E-Paper, Edition

dt. 28.01.2021, "Faecal contamination

high in Perandoor, Edappally Canals" : Applicant(s)

Versus

The Chairman, SPCB & Others : Respondent(s)

VOLUME 2 (Annexures)

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Dated this the 22nd May 2021

Rema Smrithi, Advocate
STANDING COUNSEL FOR THE 4th RESPONDENT

Annexure 1

Station	Canal	Place	Latitude	Longitude	ID
Station 1	Edapally	Indiraji Bridge, Muttar Vattekkunnam	10.0396	76.3025	E1
Station 2	Edapally	Chembokkadavu Bridge, Nethaji Nagar	10.0329	76.3047	E2
Station 3	Edapally	Lulu Mall Bridge, Lulu Mall walk way	10.0264	76.3075	E3
Station 4	Edapally	Civil Line Road, Padivattom	10.0104	76.3197	E4
Station 5	Edapally	Thuthiyoor Road Bridge, Paalachuvadu	9.9995	76.3308	E5
Station 6	Perandoor	Sasthry Nagar Bridge, Kadavanthra	9.9486	76.3000	P1
Station 7	Perandoor	A L Jacob Railway Over Bridge Gandhi Nagar	9.9765	76.2911	P2
Station 8	Perandoor	Kattakkara Canal Road, GCDA LIG Colony	9.9897	76.2911	P3
Station 9	Perandoor	Pachalam Bridge, Pachalam-Pottakuzy Road, Mamangalam	10.0046	76.2872	P4
Station 10	Perandoor	Bridge Near TLRA-53, Elamakkara	10.0164	76.2811	P5

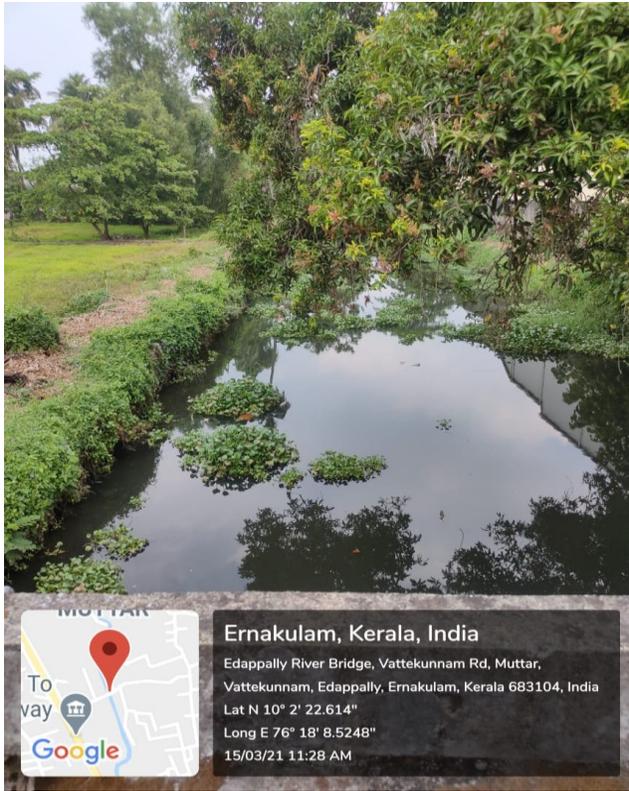


Photo 1-Indiraji Bridge (E1)

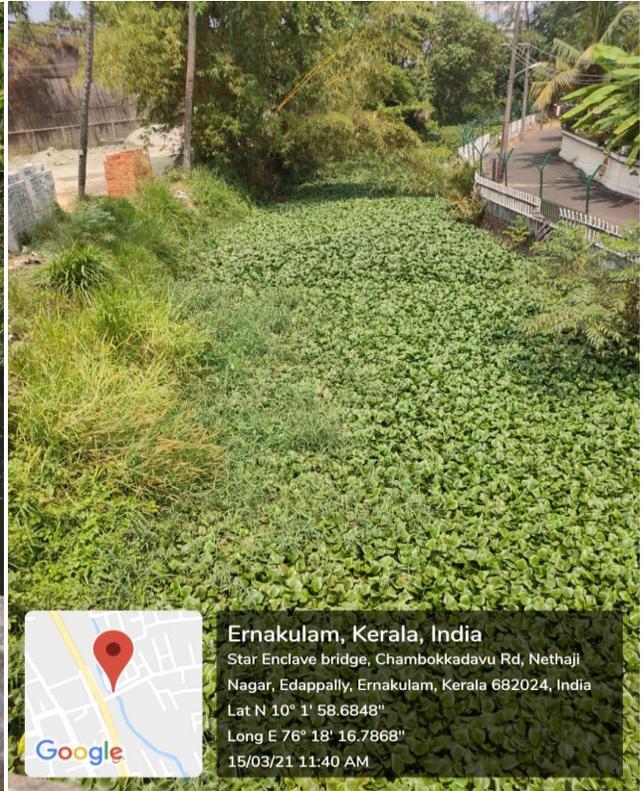


Photo 2- Chembokadavu bridge (E2)

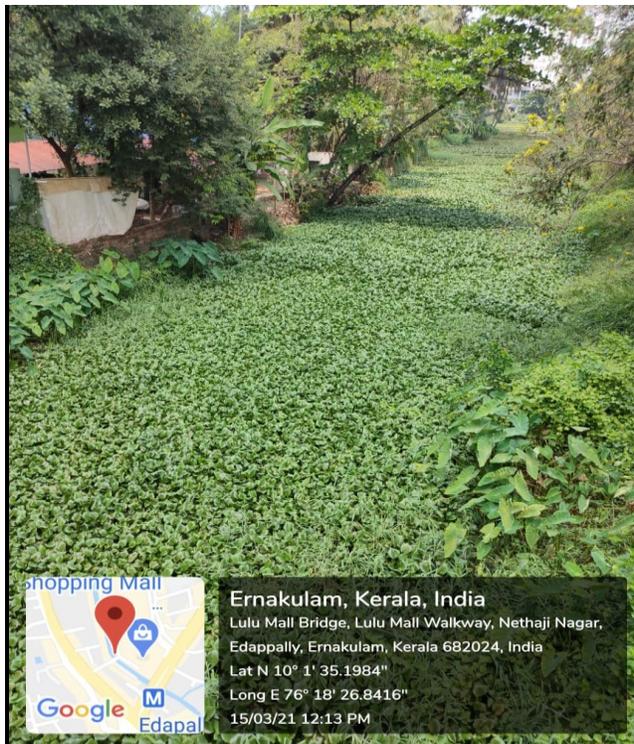


Photo 3- Lulu Mall Bridge (E3)

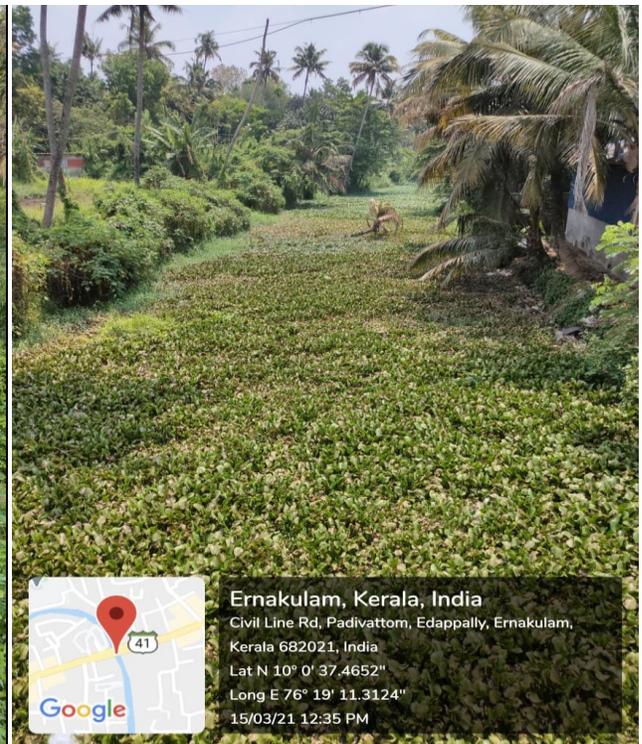


Photo 4- Civil Line Road, Padivattom (E4)

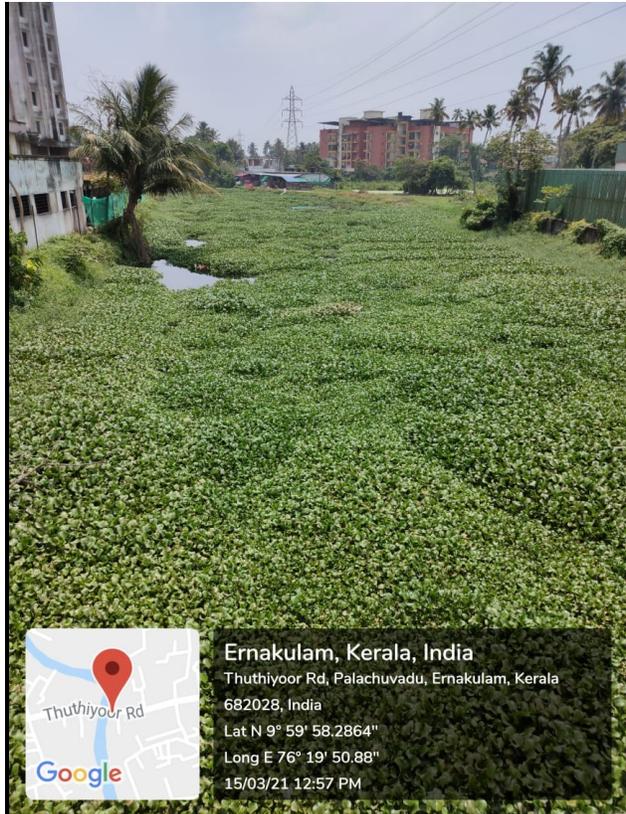


Photo 5- Thuthiyoor Road Bridge (E5)



Photo 6- Sasthry Nagar Bridge (P1)

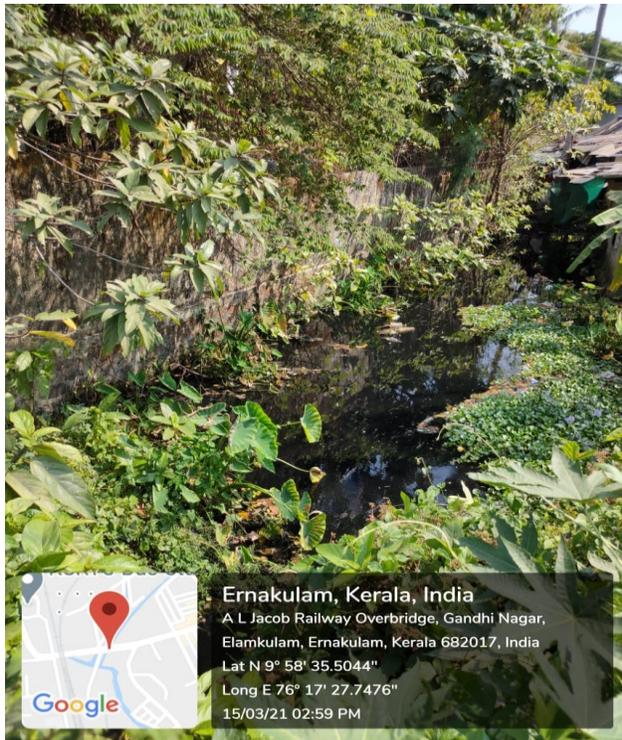


Photo 7- AL Jacob Railway Over Bridge (P2)

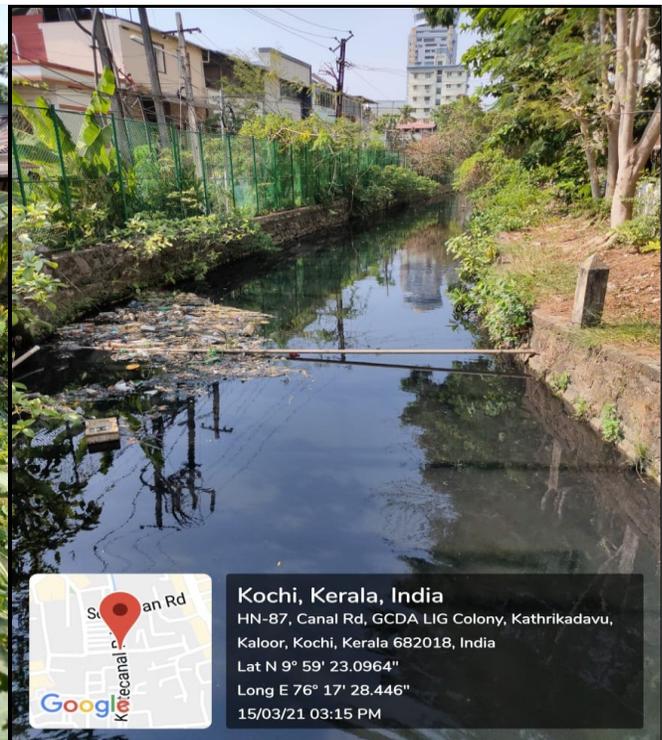


Photo 8- Kattakara Canal Road (P3)

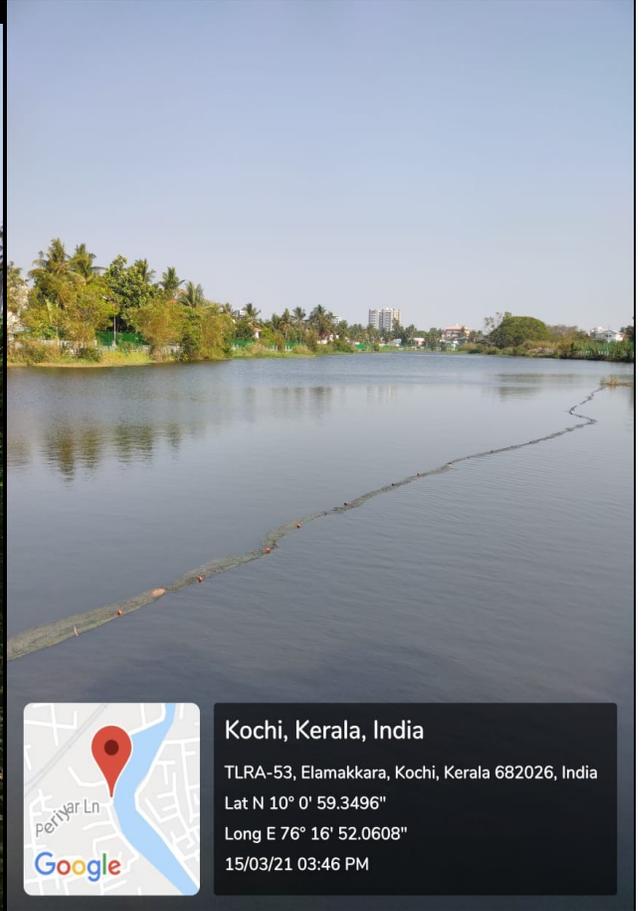
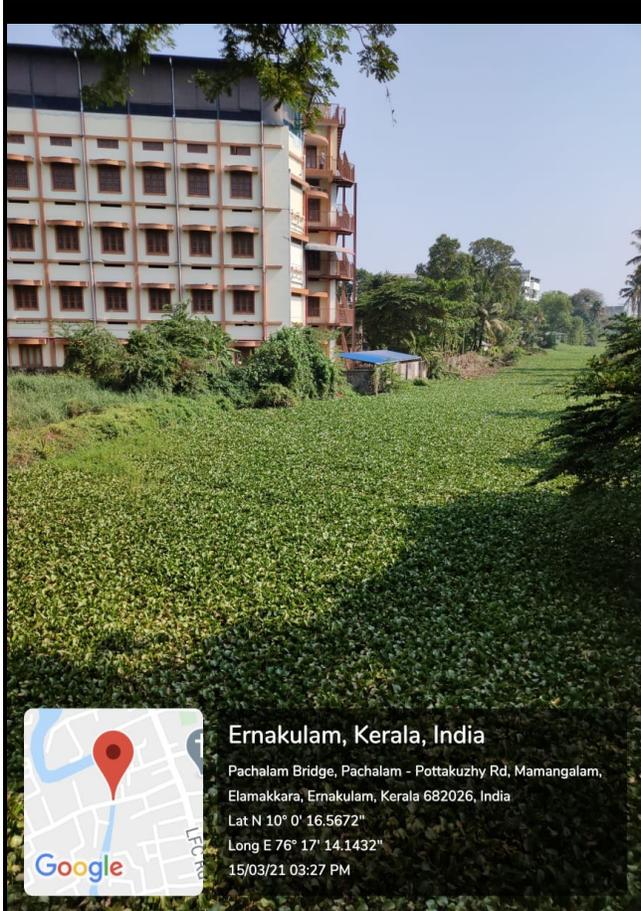


Photo 9- Pachalam Bridge(P4)

Photo 10- Bridge near TLRA- 53 (P5)

ANALYSIS RESULTS OF EDAPALLY THODU AND PERANDOOR CANAL

ANNEXURE - 3

Sample ID	Sample point	p H	Suspended Solids (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Sulphate (mg/L)	Sulphide (mg/L)	Nitrate as Nitrogen (mg/L)	Phosphate (mg/L)	Ammonia as Nitrogen (mg/L)	Free Ammonia (mg/L)	Magnesium (mg/L)	BOD (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Phenolic compounds (mg/L)	Total Coliform cfu/100ml	D O (mg/L)	Oil and Grease (mg/L)
	Limiting standards(Max)	5.5-8.5											3			2500	5	
	EDAPALLY THODU																	
E1	INDIRAJI BRIDGE, MUTTAR	6.2	15	62	0.05	1	BDL	0.07	0.8	0.66	BDL	3.4	<u>8.1</u>	1.2	BDL	<u>140000</u>	<u>0.86</u>	BDL
E2	CHEMBOKKADAVU BRIDGE	6.3	32	102	0.07	1	BDL	0.25	2	15.1	BDL	2.4	<u>16</u>	19.5	BDL	<u>580000</u>	NIL	BDL
E3	LULU MALL BRIDGE	6.3	37	47	0.06	14	BDL	0.44	2.3	13.2	BDL	6.3	<u>26.9</u>	14.2	BDL	<u>400000</u>	NIL	BDL
E4	CIVIL LANE ROAD, NEAR GEOJIT	6.5	13	60	0.07	11	BDL	0.27	1.3	17.2	0.09	1.5	<u>11.8</u>	19.3	BDL	<u>350000</u>	NIL	BDL
E5	THUTHIYOOR BRIDGE, PAALACHUVADU	6.5	20	157	0.05	12	BDL	0.29	1.4	20.1	0.1	1.5	<u>9.8</u>	22.4	BDL	<u>110000</u>	NIL	BDL
	PERANDOOR CANAL																	
P1	SASTRY NAGAR BRIDGE, KADAVANDRA	7	BDL	14464	0.06	983	BDL	0.43	0.5	0.25	0.003	24.3	<u>5.2</u>	0.84	BDL	<u>480000</u>	4.4	BDL
P2	RAILWAY OVER BRIDGE, GANDHI NAGAR	6.7	12	2340	0.05	149	BDL	0.28	1.3	14.4	0.07	2.9	<u>12.9</u>	17.6	BDL	<u>200000</u>	NIL	BDL
P3	KATTAKARA CANAL ROAD GCDA LIG COLONY	6.7	11	36	0.06	14	BDL	0.25	1.5	15.2	0.08	0.97	<u>8.1</u>	16.5	BDL	<u>800000</u>	NIL	BDL
P4	PACHALAM BRIDGE PACHALAM-POTTAKUZHI ROAD	6.8	12	1276	0.05	194	BDL	0.16	3.3	17	0.14	2.4	<u>16.7</u>	19.2	BDL	<u>800000</u>	NIL	BDL
P5	ELAMAKKARA	7.1	18	7764	0.05	881	BDL	0.29	0.2	0.66	0.007	48.6	<u>7.4</u>	1.2	BDL	<u>350000</u>	14.7	BDL



**Report on Environmental Compensation in case of
failure of preventing the pollutants being discharged
in water bodies and failure to implement waste
management rules**



CENTRAL POLLUTION CONTROL BOARD
“Parivesh Bhawan”, East Arjun Nagar,
Delhi-110032



Report on Environmental Compensation to be recovered from individuals/authorities in case of failure of preventing the pollutants being discharged in water bodies and failure to implement waste management rules

1. Background

The Committee constituted for formulation of the “Methodology for Assessing Environmental Compensation and Action Plan to Utilize the Fund” has finalized the report and placed for the approval of Board in the meeting held on 18.12.2018. The Board accorded the approval for submitting the Report/Guidelines to the Hon’ble NGT for appropriate order. Subsequently, the Hon’ble NGT in its order dated 06.12.2018 in the matter of Court of its own motion v/s State of Karnataka (Original Application No. 125/2017 and M.A. No. 1337/2018) has given following directions:

“Since failure of preventing the pollutants being discharged in water bodies (including lakes) and failure to implement solid and other waste management rules are too frequent and widespread, the CPCB must lay down specific guidelines to deal with the same, throughout India, including the scale of compensation to be recovered from different individuals/authorities, in addition to or as alternative to prosecution. The scale may have slabs, depending on extent of pollution caused, economic viability, etc. Deterrent effect for repeated wrongs may also be provided.”

2. Ideology of Environmental Compensation Formula:

In compliance of the directions of the Hon’ble Tribunal, the Committee deliberated on the issue of environmental compensation to be recovered from individuals/authorities in case of failure of preventing the pollutants being discharged in water bodies and failure to implement solid and other waste management rules. The Committee has suggested that environmental compensation in these cases should be comprised of two components i.e.

1. Cost saved/benefits achieved by the concerned individual/authority by not having proper waste/sewage management system; and
2. Cost to the environment (environmental externality) due to untreated/partially treated waste/sewage because of insufficient capacity of waste/sewage management/treatment facility.

Cost saved/benefits achieved by not having proper waste/sewage management system includes the interest on capital cost of the waste/sewage management facility and daily operation and maintenance (O&M) cost associated with the facility.

The Committee suggested that annual interest rate as 10% on loan amount, borrowed by concerned individual/authority for setting-up waste/sewage management facility, may be assumed as Capital Cost Factor for calculation of environment compensation. Further, as whole O&M cost is saved by concerned individual/authority for not managing required

waste/sewage management system, 100% of the O&M cost saved may be considered as O&M cost factor.

Therefore, generalized formula for Environmental Compensation may be described as:

$$EC = \text{Capital Cost Factor} \times \text{Marginal Average Capital Cost for Establishment of Waste or Sewage Management or Treatment Facility} \times (\text{Waste or Sewage Management or Treatment Capacity Gap}) + \text{O\&M Cost Factor} \times \text{Marginal Average O\&M Cost} \times (\text{Waste or Sewage Management or Treatment Capacity Gap}) \times \text{No. of Days for which facility was not available} + \text{Environmental Externality}$$

Cost to the environment due to untreated/partially treated waste/sewage discharge by concerned individual/authority may be assumed as recommended by the committee, which is mentioned below:

Table No. 1: Environmental externality for untreated/partially treated sewage discharge

Sewage Treatment Capacity Gap (MLD)	Environmental Externality (Rs. per MLD/day)	Minimum and Maximum value of Environmental Externality recommended by the Committee (Lacs Rs. Per Day)
Up to 100	10	Min. 0.05 Max. 0.10
100-500	20	Min. 0.10 Max. 0.15
500 and above	30	Min. 0.20 Max. 0.30

Table No. 2: Environmental externality for improper municipal solid waste management

Municipal Solid Waste Management Capacity Gap (TPD)	Environmental Externality (Rs. per ton per day)	Minimum and Maximum value of Environmental Externality recommended by the Committee (Lacs Rs. Per Day)
Up to 500	5	Min. 0.05 Max. 0.10
500-5000	10	Min. 0.10 Max. 0.15
5000-10000	15	Min. 0.20 Max. 0.30

The Committee further decided to fix a cap for minimum and maximum cost for capital and O&M component for Environmental Compensation, which are given in below tables:

Table No. 3: Minimum and Maximum EC to be levied for untreated/partially treated sewage discharge

Class of the City/Town	Mega-City	Million-plus City	Class-I City/Town and others
Minimum and Maximum values of EC (Total Capital Cost Component) recommended by the Committee (Lacs Rs.)	Min. 2000 Max. 20000	Min. 1000 Max. 10000	Min. 100 Max. 1000
Minimum and Maximum values of EC (O&M Cost Component) recommended by the Committee (Lacs Rs./day)	Min. 2 Max. 20	Min. 1 Max. 10	Min. 0.5 Max. 5

Table No. 4: Minimum and Maximum EC to be levied for improper municipal solid waste management

Class of the City/Town	Mega-City	Million-plus City	Class-I City/Town and others
Minimum and Maximum values of EC (Capital Cost Component) recommended by the Committee (Lacs Rs.)	Min. 1000 Max. 10000	Min. 500 Max. 5000	Min. 100 Max. 1000
Minimum and Maximum values of EC (O&M Cost Component) recommended by the Committee (Lacs Rs./day)	Min. 1.0 Max. 10.0	Min. 0.5 Max. 5.0	Min. 0.1 Max. 1.0

The application of formula for calculation of EC may be further understood with the example of two typical cases.

Example No. 1: Environment Compensation for Discharge of Untreated/Partially Treated Sewage by Concerned Individual/Authority:

BIS IS-1172:1993 suggests that for communities with population above 100,000, minimum of 150 to 200 lpcd of water demand is to be supplied. Further, 85% of return rate (CPHEEO Manual on Sewerage and Sewage Treatment Systems, 2013), may be considered for calculation of total sewage generation in a city. CPCB Report on "Performance evaluation of sewage treatment plants under NRCD, 2013", describes that the capital cost for 1 MLD STP ranges from 0.63 Cr. to 3 Cr. and O&M cost is around Rs. 30,000 per month. After detail deliberations, the Committee suggested to assume capital cost for STPs as Rs. 1.75 Cr/MLD (marginal average

cost). Further, expected cost for conveyance system is assumed as Rs. 5.55 Cr./MLD (marginal average cost) and annual O&M cost as 10% of the combined capital cost. Population of the city may be taken as per the latest Census of India. Based on these assumptions, Environmental Compensation to be levied on concerned ULB may be calculated with the following formula:

EC= Capital Cost Factor x [Marginal Average Capital Cost for Treatment Facility x (Total Generation-Installed Capacity) + Marginal Average Capital Cost for Conveyance Facility x (Total Generation -Operational Capacity)] + O&M Cost Factor x Marginal Average O&M Cost x (Total Generation- Operational Capacity) x No. of Days for which facility was not available + Environmental Externality

Alternatively;

EC (Lacs Rs.) =17.5(Total Sewage Generation – Installed Treatment Capacity) + 55.5(Total Sewage Generation-Operational Capacity) + 0.2(Sewage Generation-Operational Capacity) x N + Daily Environmental Externality x N

Where;

N= Number of days from the date of direction of CPCB/SPCB/PCC till the required capacity systems are provided by the concerned authority

Note: In order to include deterrent effect for continuous violations, component of O&M in EC formula may be increased on exponential basis by 2, 4, 8, 16.... times on every six-months, beyond the time prescribed by authority for ensuring complete treatment of sewage of the city/town.

Table No. 5: Sample calculation for EC to be levied for discharge of untreated/partial treated Sewage

City	Delhi	Agra	Gurugram	Ambala
Population (2011)	1,63,49,831	17,60,285	8,76,969	5,00,774
Class	Mega-City	Million-plus City	Class-I Town	Class-I Town
Sewage Generation (MLD) (as per the latest data available with CPCB)	4195	381	486	37
Installed Treatment Capacity (MLD) (as per the latest data available with CPCB)	2500	220	404	45.5
Operational Capacity (MLD) (as per the latest data available with CPCB)	1900	140	300	24.5
Treatment Capacity Gap (MLD)	2295	241	186	12.5
Calculated EC (capital cost component for STPs) in Lacs Rs.	29662.50	2817.50	1435.00	0.00
Calculated EC (capital cost component for Conveyance System) in Lacs. Rs.	127372.50	13375.50	10323.00	693.75
Calculated EC (Total capital cost component) in Lacs Rs.	157035.00	16193.00	11758.00	693.75
Minimum and Maximum values of EC (Total Capital Cost Component) recommended by the Committee (Lacs Rs.)	Min. 2000 Max. 20000	Min. 1000 Max. 10000	Min. 100 Max. 1000	Min. 100 Max. 1000
Final EC (Total Capital Cost Component) in Lacs Rs.	20000.00	10000.00	1000.00	693.75
Calculated EC (O&M Component in Lacs Rs./day)	459.00	48.20	37.20	2.50
Minimum and Maximum values of EC (O&M Cost Component) recommended by the Committee (Lacs Rs./day)	Min. 2 Max. 20	Min. 1 Max. 10	Min. 0.5 Max. 5	Min. 0.5 Max. 5
Final EC (O&M Component) in Lacs. Rs./Day	20.00	10.00	5.00	2.50
Calculated Environmental Externality (Lacs Rs .Per Day)	0.6885	0.0482	0.0186	0.0013
Minimum and Maximum value of Environmental Externality recommended by the Committee (Lacs Rs. Per Day)	Min. 0.20 Max. 0.30	Min. 0.10 Max. 0.15	Min. 0.10 Max. 0.15	Min. 0.05 Max. 0.10
Final Environmental Externality (Lacs Rs. Per day)	0.30	0.10	0.10	0.05