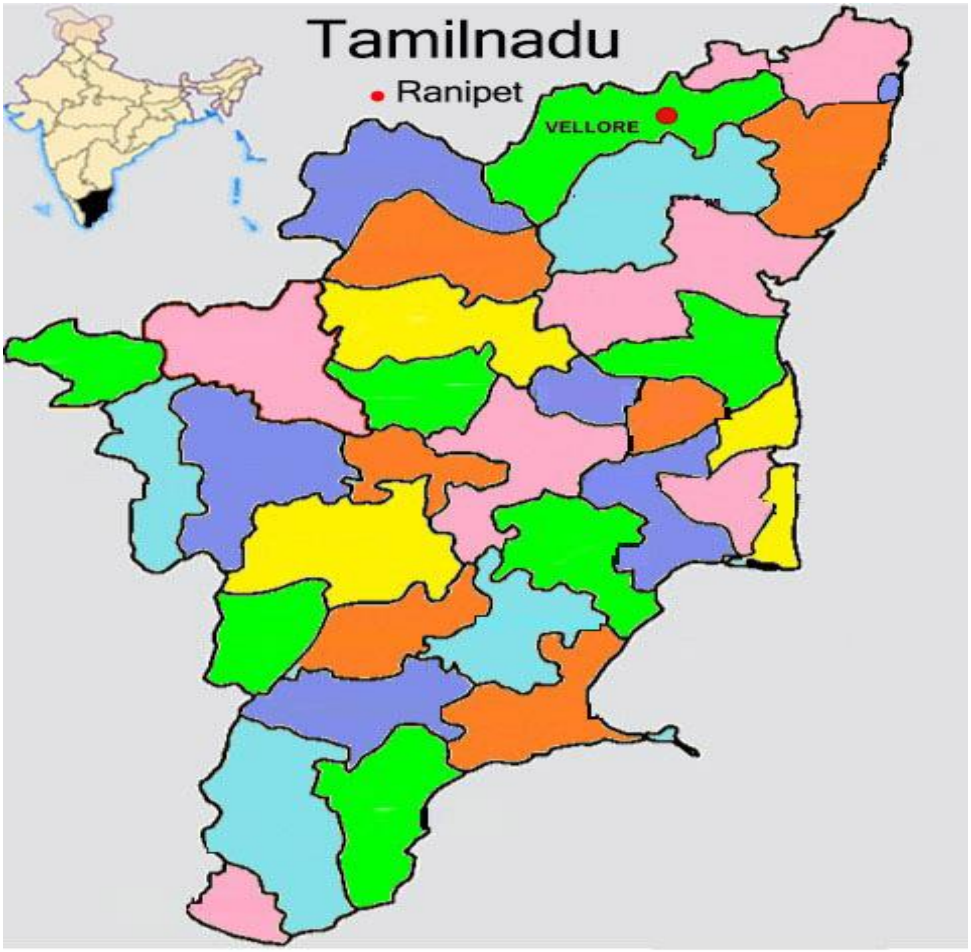
EVALUATION OF CEPI SCORE & ACTION PLAN FOR CEPI AREA OF SIPCOT INDUSTRIAL COMPLEX, RANIPET, VELLORE DISTRICT



SUBMITTED
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TAMILNADU POLLUTION CONTROL BOARD

INDEX

EXECUTIVE SUMMARY

Ranipet SIPCOT Industrial Complex is classified as Critically Polluted Industrial Area (CPA) based on the Comprehensive Environmental Pollution Index (CEPI) score assessed by CPCB during March 2018 for Air, Water and Land Environment.

The Tamil Nadu Pollution Control Board (TNPCB) finalized the locations of sampling for Air, Water and Land Environment in consideration with the previous CEPI monitoring. The existing sampling locations with respect to air monitoring , groundwater sampling and surface water sampling where monitoring was undertaken during 2009, 2011, 2013, 2017 and 2018 were sampled. In addition to the existing four sampling stations located in the core area, three additional Ambient Air Quality stations were identified in the CEPI impact area, and Ambient Air Quality survey was conducted. Further, in addition to the existing four sampling stations located in the impact zone, four additional surface water sampling stations were identified in the CEPI Impact Zone. The sampling and analysis were carried out as per the CPCB / EPA/ APHA / IS / ASTM standard methods.

After the sampling and analysis of both Air & Water, the results were used for calculating the CEPI score as per the CPCB revised guidelines of 2016.

As per the CEPI score, Ranipet is classified as Critically Polluted Area (CPA) and the CEPI Score is 79.38. CPCB considered Ni as primary pollutant and $PM_{2.5,}$ PM_{10} as secondary pollutant with respect to Air Environmental Pollution Index (AEPI) and the individual score for air environment is 49.0.

CPCB has considered Total Ammonical (NH4+NH3) Nitrogen as Primary Pollutant and BOD, Total Chromium as secondary pollutants with respect to Surface Water Environmental Pollution Index (SWEPI) and individual score for the surface water environment is 75.0.

CPCB has considered Total Phosphorus as primary pollutant and Total Hardness and Iron as secondary pollutants with respect to Ground Water Environmental Pollution Index (GWEPI) and individual score for the ground water environment is 35.75.

From the CEPI score it was noted that the score arrived for Air and Land environment was reported to be normal, however the score arrived for Surface Water

environment 75.0 and the overall score was arrived as 79.38 which is categorized as Critically Polluted Area.

Further Air, Surface Water and Ground Water samples were collected and analysed during November/ December 2019 by TNPCB / NABL accredited labs in the vicinity of CEPI area. From the Report of Analysis (ROA) it was noticed that the Primary Pollutant and Secondary Pollutants in the ambient air are well within the limits of National Ambient Air Quality (NAAQ) standards.

The ROA of Surface Water samples reveals that the parameter of Total Ammonical (NH4+NH3) Nitrogen is below the detectable limit and the Biological Oxygen Demand (BOD) exceeds in 1 out of 3 locations in the running water samples and the remaining 5 locations results are not considered since it is stagnated water, further the Total Chromium exceeds 3 out of 8 locations.

The ROA of Ground Water sample reveals that the parameter of Total Phosphorus exceeds 1 out of 4 locations, the Secondary Pollutant Total Hardness is well within the limits of Drinking Water standards - IS 10500, and the parameter of Iron content exceeds 1 out of 4 locations.

The regional office of Tamil Nadu Pollution Control Board has taken various initiatives in reducing the CEPI Score of 81.79 of 2009 to **28.13** of 2019 post monsoon for that all the 17 category units, Common Effluent Treatment Plants (CETPs) and Red Large units have installed Zero Liquid Discharge System to achieve Zero liquid Discharge.

Based on the study results the CEPI score as per the revised CEPI, 2016, the CEPI score of Post-Monsoon 2019 -Ambient Air is 16, Surface Water is 20 , and Ground Water is 25.75 respectively. The overall CEPI score for Ranipet SIPCOT Industrial Complex **for the Post-monsoon 2019 is 28.13**

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1. Introduction.

Industrial pollution is the contamination of the environment by businesses, particularly plants and factories that dump waste products into the air and water. Industrial waste is one of the largest contributors to the global pollution problem endangering people and the environment. The Central Pollution Control Board (CPCB) has developed a Comprehensive Environmental Pollution Index (CEPI). The main objective of the study is to identify polluted industrial clusters or areas in order to take concerted action and to centrally monitor them at the national level to improve the current status of their environmental components such as air and water quality data, ecological damage, and visual environmental conditions.

The concept of Comprehensive Environmental Pollution Index (CEPI) was evolved by Central Pollution Control Board (CPCB) during 2009-10 as a tool for comprehensive environmental assessment of prominent industrial clusters and formulation of remedial Action Plans for the identified critically polluted areas. CEPI is a rational number between 0 and 100, assigned to a given location to characterize the environmental quality following the algorithm of source, pathway and receptor. Out of identified 88 prominent industrial clusters, 43 industrial clusters in 16 States having CEPI score of 70 and above are identified as Critically Polluted Industrial Clusters. Further, 32 industrial clusters with CEPI scores between 60 & 70 are categorized as severely polluted areas. Thereafter, Ministry of Environment & Forests (Govt. of India) had imposed temporary moratorium vide O. M. 13.01.2010 on consideration of developmental projects in critically polluted industrial cluster/areas including the projects in the pipeline for Environmental Clearance.

Later-on proposals were received from the SPCBs, State Governments, and Industrial Associations and concerned Stakeholders for revisiting the criteria of assessment under CEPI concept. After careful examination and consideration of the suggestions of concerned stakeholders, it was decided to prepare the revised concept of CEPI by eliminating the subjective factors but retaining the factors which can be measured precisely.

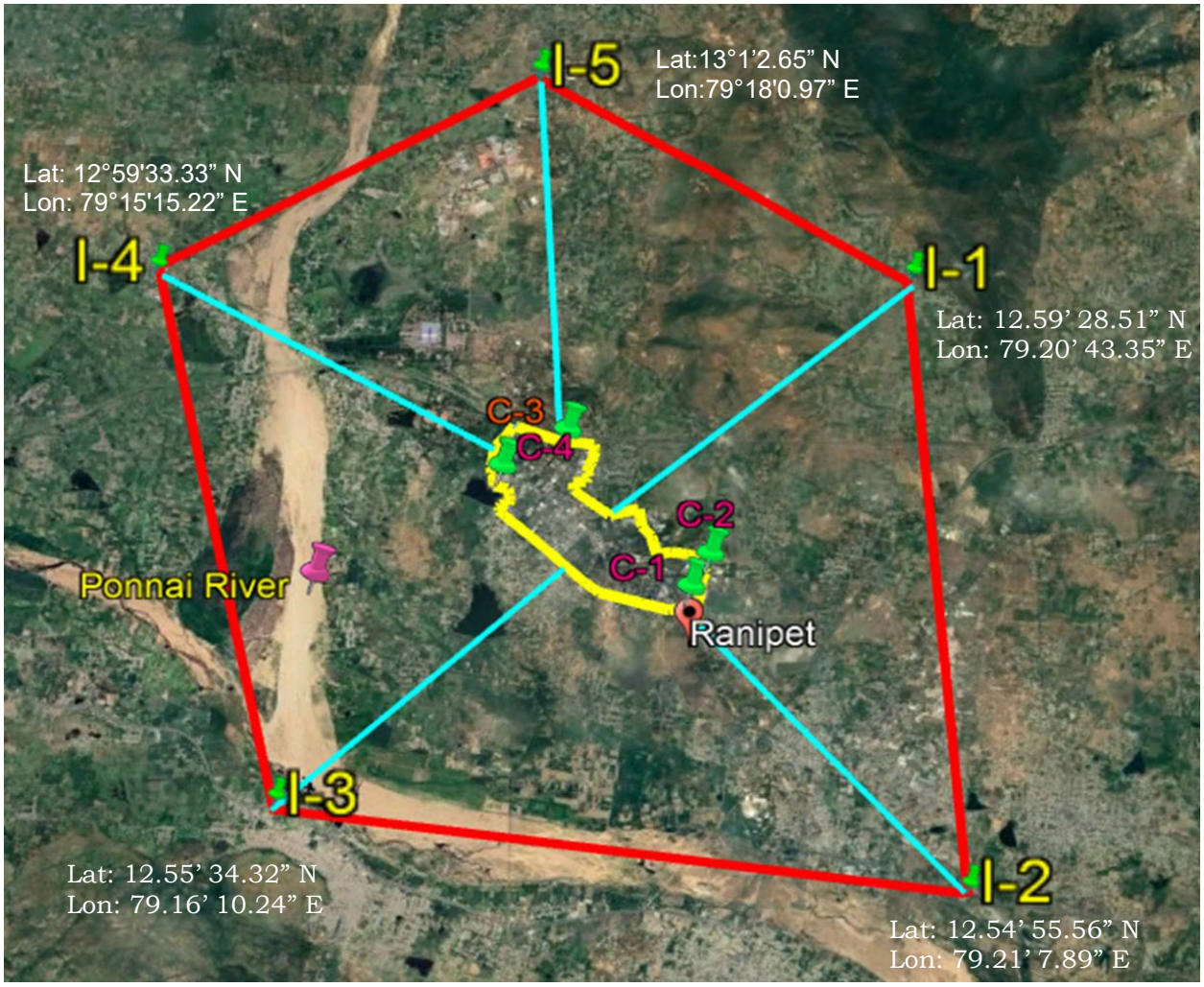
The present CEPI study includes Ranipet SIPCOT Industrial Complex, Vellore North Arcot, Tamil Nadu state. It is one of the best industrial area situated near Vellore and adjacent to Madras- Bangalore National Highway (NH- 4). The industrial part of this place has a number of factories manufacturing Petro Chemical, Chemical, Pharma, Pigments and Tanneries. Government of Tamilnadu has established Industrial Estate at Ranipet in the year 1972. This estate is known as Ranipet SIPCOT Industrial Complex.

1.1 CEPI Area Boundary details:

Total area of the Critically Polluted Area:

1	SIPCOT Phase-I	2.88 Sq.Kms
2	SIPCOT Phase-II	0.5261 Sq.Kms
	Total	**3.40 Sq.Kms**

MAP SHOWING SAMPLE LOCATIONS AND BOUNDARIES OF CORE & IMPACT ZONE OF CEPI AREA – RANIPET:



Boundaries of Core & Impact Zones with offset line with buffer distance of 5 KM

Boundaries of Core Zone in the Critically Polluted Area

Boundaries of Impact Zone in the Critically Polluted Area

Offset line (5km)

Boundaries of Core Zone in the Critically Polluted Area (CPA) in terms of geographical coordinates

a) Boundaries of (Core zone) Critically Polluted Area (CPA) are marked as

S.No.	Location	Coordinates
C-1	South – East (Malladi Drugs and Pharmaceuticals Ltd.,- Unit I)	Lat: 12.950881 Lon: 79.318435
C-2	North – East (Malladi Drugs and Pharmaceuticals Ltd.,- Unit II)	Lat: 12.953628 Lon: 79.320325
C-3	North – West (Kamar Chemicals Ltd.,)	Lat: 12.970441 Lon: 79.303540
C-4	South – West (SVISS Lab. Ltd.,)	Lat: 12.965910 Lon: 79.295675

b) Boundaries of Impact Zone in the Critically Polluted Area (CPA) after incorporated the additional surface water samples location & Air Samples location are marked as

S.No.	Location	Coordinates
I-1	North East – Kalpudhur, Walajapet Taluk	Lat: 12.59’ 28.51” N Lon: 79.20’ 43.35” E
I-2	East – Vannivedu, Walajapet Taluk	Lat:12°54'55.56”N Lon:79°21'7.89”E
I-3	South – Palar River (GIT College Front side)	Lat:12°55'34.32”N Lon:79°16'10.24”E
I-4	West – Govt. Higher Secondary School, Thiruvalam	Lat: 12°59'33.33”N Lon: 79°15'15.22”E
I-5	North – Poonai Main Road, Nellikuppam	Lat:13°1’2.65”N Lon:79°18'0.97”E

1.2 Habitation details in CEPI Area:

The following villages/hamlets are located within 2 km of the impact zone

S.No	Name of the village	Direction in which located	Distance in KM	Population in Numbers
1	Karai	South	1.5	10,628
2	Maniyambatu	West	1.2	3,971
3	Puliankanu	South west	2.0	5,344
4	Vanapadi	North west	1.5	4,777
Total				**24,720**

1.3 Eco Geological Features in and around CEPI Area:

There are no eco-geological features within 5 Km radius from the RANIPET SIPCOT Industrial Complex.

Major Water Bodies:

Ranipet has two major water bodies Palar River, & River Ponnai. The Palar River is running at a distance of 2.5 Km and River Ponnai is running at a distance of 2 Km from the CEPI core zone.

Ecological parks, Sanctuaries, Flora and Fauna or any eco-sensitive Zones

No ecological parks, sanctuaries, flora and fauna or any eco-sensitive zones are present within 5Km radius from the RANIPET SIPCOT Industrial Complex.

Monuments of Historical/archaeological importance

No Monuments of Historical/archaeological importance are present within 5Km radius from the Ranipet SIPCOT Industrial Complex.

1.4 Industries details in CEPI Area

Current number of 17 Category of highly polluting industries and Red & Orange Category Industries located in the Critically Polluted Area.

Category	Red	Orange	Green
17 Category	4	-	-
Large	8	11	01
Medium	1	3	07
Small	117	179	18
Total	130	193	26
Total No of Industries	**349**		

There are 4 numbers of 17 category industries operating in SIPCOT of which 3 are Bulk drug and one Petrochemical industries. Also, 2 CETP's are in operation for treating Tannery Effluents generates from 99-member tannery units.

1.5 Green Belt Development details in CEPI Area:

Green Belt Development:

S. No.	Name of the Industry	Total area in Hectares	No. of Trees developed		Proposed
			2017 -18	2018 –19	2019 -20
1	Thirumalai Chemicals Limited	19.0	533	708	720
2	Malladi Drugs and Pharmaceuticals limited – Unit - 1	5.7	8700	1400	1000
3	Malladi Drugs and Pharmaceuticals limited – Unit - 3	0.67	4530	-	1000
4	SVISS LABSS Pvt. Limited	1.2	205	256	5% Increase
5	Ultramarine & Pigments Limited	8.66	756	802	840
6	Ranipet SIDCO Finished Leather Effluent Treatment Company Limited – CETP- Phase – 1.	0.4	100	600	700

Varity of Species planted in Green Belt:

Neem, Pungai, Banyan, Arasan, Badam, Black Palm, Nuna, Teak, Guava, Vagai, Ecalyptus, Mango, Punnai, Katuva, Asoka, Illupai, Tamarind

1.6 CEPI score declared by CPCB:

CEPI Score for the last five years

Below given Table shows aggregated CEPI Score 2009, 2011, 2013, and CPCB report 2018

Period	CEPI Score
CEPI Score 2018	**79.38**
CEPI Score 2013	**79.67**
CEPI Score 2011	**84.79**
CPCB Report 2009	**81.79**

Vellore, Ranipet, Tamil Nadu – CEPI 2018 by CPCB

Air Quality Analysis Report

Pollutant	Groups	A1	A2	
PM_{10}	B	0.5	Large	A (A1xA2)
$PM_{2.5}$	B	0.5		
Ni	C	3		
		4	**4**	**16**

Pollutants	Avg. (1)	Std. (2)	EF [(3)=1/2]	No. of Samples Exceeding (4)	Total No. of Samples (5)	SNLF Value [(6) = 4/5x3]	SNLF Score (B)	
PM_{10}	91.17	100	0.91	1	12	0.08	M	3
$PM_{2.5}$	37.58	60	0.63	0	12	0.00	L	0
Ni	27.93	20	1.40	12	12	1.40	C	30
B Score = (B1 + B2 + B3)							**B**	**33**

C	**0**	**< 5%**
D	**0**	**A-A-A**

AIR EPI	**(A + B + C + D)**	**49.00**

Water Quality Analysis Report

Pollutant	Groups	A1	A2	
BOD	B	0.5	Large	A(A1xA2)
NH4-N	A	0.25		
T Cr	C	3		
		3.75	**4**	**15**

Pollutants	Avg (1)	Std (2)	EF[(3) =1/2]	No of Samples Exceeding (4)	Total no. of Samples (5)	SNLF Value [(6) = 4/5x3]	SNLF Score (B)	
BOD	63.17	8.00	7.90	9	12	5.92	C	10
NH4-N	29.66	1.50	19.77	9	12	14.83	C	30
T Cr	0.23	0.10	2.34	9	12	1.76	C	10
B Value = (B1 + B2 + B3)							B	50

C	**10**	**> 10%**
D	**0**	**A-A-A**

Water EPI	**(A + B + C + D)**	**75.00**

Ground Water Quality Analysis Report

Pollutant	Groups	A1	A2	
TP	B	2	Large	A (A1xA2)
Fe	A	0.25		
T Hard.	A	0.25		
		2.5	**4**	**10**

Pollutants	Avg. (1)	Std. (2)	EF [(3)=1/2]	No of Samples Exceeding (4)	Total no. of Samples (5)	SNLF Value [(6) = 4/5x3]	SNLF Score (B)	
TP	0.27	0.30	0.91	3	12	0.23	M	11.25
Fe	0.20	0.30	0.66	3	12	0.16	M	3.5
T Hard.	491.5	600.0	0.82	0	12	0.00	L	1
B Value = (B1 + B2 + B3)							**B**	**15.75**

C	10	> 10%
D	0	A-A-A

GW EPI	(A + B + C + D)	35.75

AIR	:	49.00
WATER	:	75.00
GROUND WATER	:	35.75
CEPI SCORE	:	79.38

2.0 AIR ENVIRONMENT

2.1 Primary and Secondary Pollutants considered for AEPI:

i) Primary Pollutant:

Pollutants relevant with the Area depending on the nature of Industrial activity and depending on the concentration and exceedence.

Based on the Nature of Toxins (Group A, Group B, Group C)

Group A – Toxins that are not assessed as acute or systemic = 1

Group B – Organics that are probable carcinogens (USEPA Class 2 and 3) or substances with some systemic toxicity, for example, VOCs, PAHs, PCBs, PM_{10} and $PM_{2.5}$ = 2

Group C –Known carcinogens or chemicals with significant systemic or organ system toxicity, for example, vinyl chloride, benzene, lead, radionuclide, hex chromium, cadmium, and organophosphate = 3

ii) Secondary Pollutants:

- Contribution of remaining two secondary pollutants will be based on the nature of the toxins as mentioned below:

Group of toxicity of each of the Secondary Pollutants	Contribution Value for each of the pollutant
Group A	0.25
Group B	0.50
Group C	1.00

Max. Contribution of secondary pollutants = 2.00 Max. Score of as A1= 3+2=5

Primary Pollutant /Criteria Pollutant

Pollutant parameters such as **Nickel (Ni)** was selected as primary pollutant as considered in the CPCB report 2018.

Secondary Pollutant:

Pollutant parameters such as **PM_{10}**, **$PM_{2.5}$** are selected based on toxins and as well as on concentration as considered in the CPCB report 2018.

2.2 Air Quality Sampling Locations:

Critical locations have to be identified based on the meteorological parameters within the industrial area. In addition to air pollution contribution from the industries, vehicles movement on the adjacent roads is also contributing to the heavy vehicular traffic causing the air pollution. Hence, there is a necessity to establish continuous air quality monitoring stations in consultation with CPCB.

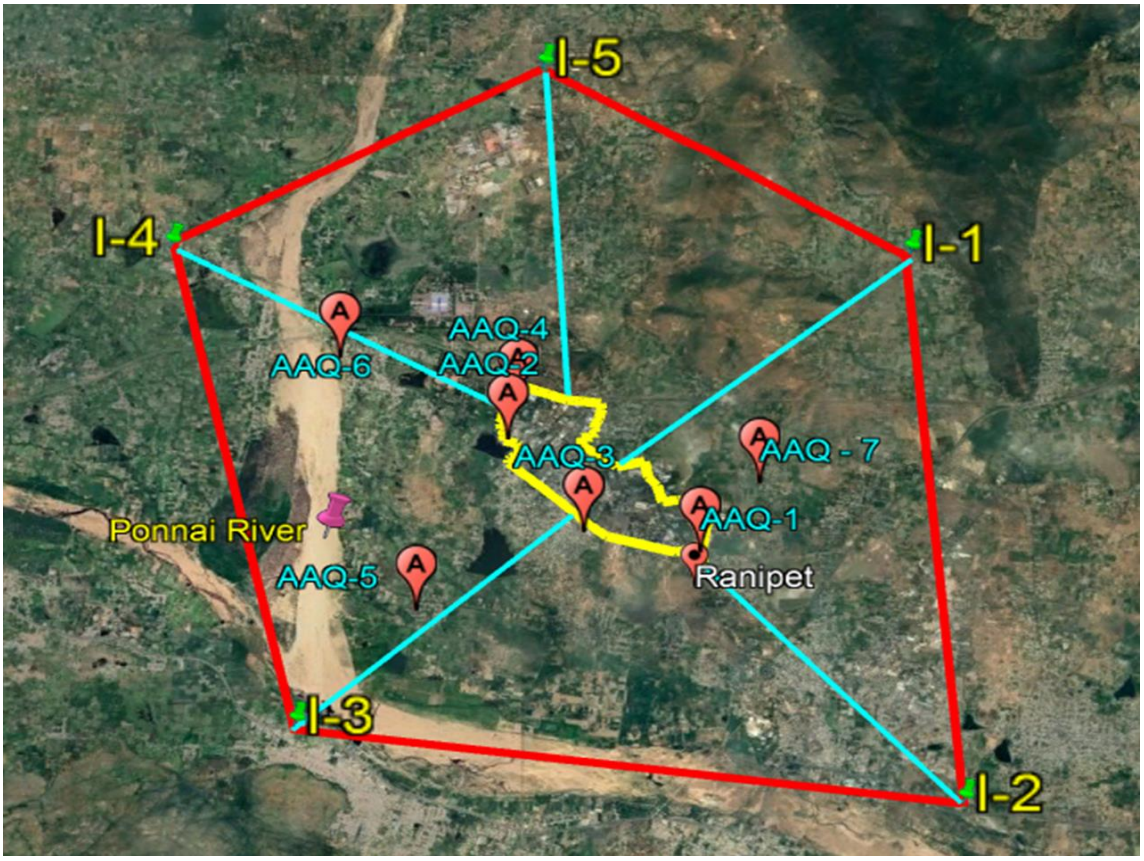
The presence of “Nickel” concentration is the issue in the Ambient Air as per the CPCB report 2018. Hence in addition to the existing four sampling stations located in the core area, three additional Ambient Air Quality (AAQ) stations were identified in the CEPI impact area, and Ambient Air Quality survey was conducted.

At Ranipet, Ambient Air Quality was monitored at seven locations, namely:

i) Malladi Drugs & Pharmaceuticals Ltd.,
ii) SIVSS Labs Pvt. Ltd.,
iii) CSI Higher Secondary School
iv) Greaves Cotton Ltd.,
v) Avarakkari (Kothandaraman Temple) - (Additional Point)
vi) Sikkarajapuram–TNHB, Plot No.268 - (Additional Point)
vii) Vanapadi (Big Street -Balaraman House) - (Additional Point)

At all these places, critical parameters which are considered during 2017 are monitored.

Boundary Map showing sampling locations of Air in CEPI Area



Locations of Ambient Air Quality Survey

S.No	Name of Location	Latitude	Longitude
AAQ-1	Malladi Drugs & Pharmaceuticals Ltd.,	12°57'01.8"N	79°19'11.0"E
AAQ-2	SIVSS Labs Ltd.,	12°57'58.2"N	79°17'45.5"E
AAQ-3	CSI Higher Secondary School	12°57'11.9"N	79°18'19.2"E
AAQ-4	Greaves Cotton Ltd.,	12°58'15.7"N	79°17'50.1"E
AAQ-5	Avarakkari (Kothandaraman Temple) **(Additional Point)**	12°56'32.6"N	79°17' 4.7"E
AAQ-6	Sikkarajapuram–TNHB, Plot No.268 **(Additional Point)**	12°58'38.99"N	79°16'30.91"E
AAQ-7	Vanapadi - Big Street -Balaraman House **(Additional Point)**	12°57'36.7"N	79°19'37.38"E

2.3 Status of AAQ in 2018 in CEPI Area:

AMBIENT AIR QUALITY SURVEY REPORT – 2018 POST MONSOON PERIOD

Parameters	Mean Concentration	No. of Samples exceeding	Total No. of samples	NAAQS *	Units
Particulate Matter (PM_{10})	91.17	1	12	100	$\mu g/m^3$
Particulate Matter ($PM_{2.5}$)	37.58	0	12	60	$\mu g/m^3$
Nickel (Ni)	27.93	12	12	20	ng/m^3

Particulate Matter (PM_{10})

Out of 12 samples one sample exceeding the National Ambient Air Quality (NAAQ) Standards and 11 samples are within the NAAQ standards. However the mean concentration of PM_{10} is well within the limits of NAAQ standards.

Particulate Matter ($PM_{2.5}$):

Out of 12 samples all are well within the limits of NAAQ standards, also the mean concentration of $PM_{2.5}$ is well within the limits of NAAQ standards.

Nickel (Ni):

Out of 12 samples all the samples are exceeding the limits of NAAQ standards and also the mean concentration of Ni is exceeding the limits of NAAQ standards

2.4 Industries Stack Emission Details:

Details of the industries operating in the SIPCOT pertaining to air pollution point of view are listed below

Stack Emission Sources:

S.No	Company Name M/s.	Emission Sources	APC Measures Provided	Stack Height in m
1	M/s. Thirumalai Chemicals Limited	1.Stack _ PA1 (Wet Scrubber)	Wet Scrubber	47
		2.Stack _ PA2 (Wet Scrubber)	Wet Scrubber	47
		3.Stack _ PA3 (Wet Scrubber)	Wet Scrubber	30
		4.Thermic Fluid Heater Stack	-	46
2	Malladi Drugs and Pharmaceuticals Limited, Unit – 1	1.Boiler 4 TPH	-	21
		2.Boiler 3.5 TPH	-	30.5
		3.Boiler 6 TPH	-	36.5
3	Malladi Drugs and Pharmaceuticals Limited, Unit – 3	1.Boiler 4 TPH	-	36
4	SVISS LABSS Pvt. Limited	1.Boiler (1.5T/hr)	-	15
5	Ultramarine & Pigments Limited,	1.Pigment Plant stack	Wet Alkali Scrubber with cyclones	53
		2.Thermic Fluid Heater-1 Stack	-	9
		3.Thermic Fluid Heater – 2 Stack	-	12
		4.Spray Tower Plant Stack	-	22
		5.Dry Mix Plant Stack	Cyclone separator	8
		6.Boiler Stack	-	31
		7.Sulphonation Plant Stack	Wet Alkali Scrubber	30
		8.Calcination Kiln Stack	-	28
		9.Mobile Dust collector1&2	-	-
		10. Bag Filter Outlet in Pigment Dryer	Bag Filter	-
		11. Bag Filter Outlet in Pigment Blending	Bag Filter	-
		12.Ball Milling Operation	-	-
6	Ranipet SIDCO Finished Leather Effluent Treatment Company Limited – CETP- Phase – 1.	1.Boiler – 5(T/Hr.)	-	34.5
7	SIPCOT-SIDCO Phase-II Entrepreneur Finished Leather Effluent Treatment Co. (P) Ltd	Boiler (2 T)	-	18.0
Total Stack Height				**554.5**

Therefore, the ground level Emission concentration prevails at a distance of

= **(554.5/19) X 10 = 292** m. from the center of the core zone.

Stack Survey Results:

2017-18

S. No	Name of the Industry M/s	STACK mg/m^3				
		PM	SO_2	NO_2	CO	NH_3
1	Thirumalai Chemicals Limited	62	171	32.4	-	-
2	Malladi Drugs and Pharmaceuticals limited – Unit - 1	79	75	32.2	-	-
3	Malladi Drugs and Pharmaceuticals limited – Unit - 3	76	87	15.5	-	-
4	SVISS LABSS Pvt. Limited	65	<0.5	4.8	-	-
5	Ultramarine & Pigments Limited	131	192	37.6	-	-
6	Ranipet SIDCO Finished Leather Effluent Treatment Company Limited – CETP- Phase – 1.	84	11.7	24.3	-	-

2018-19

S. No	Name of the Industry M/s	STACK mg/m^3				
		PM	SO_2	NO_2	CO	NH^3
1	Thirumalai Chemicals Limited	58	171	44.2	-	-
2	Malladi Drugs and Pharmaceuticals limited – Unit - 1	82	21	30.3	-	-
3	Malladi Drugs and Pharmaceuticals limited – Unit - 3	87	96	22.4	-	-
4	SVISS LABSS Pvt. Limited	80	<0.5	6.1	-	-
5	Ultramarine & Pigments Limited	117	171	36.3	-	-
6	Ranipet SIDCO Finished Leather Effluent Treatment Company Limited – CETP- Phase – 1.	93	8.4	25.7	-	-

2.5 Quantification of Stack Emission Load:

2017-2018

1. Thirumalai Chemicals Limited:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
Scrubber # 1 (PA Plant # 142)	1323600	12	381	0.5	16	2.5	79
Scrubber # 2 (PA Plant #144)	1225800	13	382	0.5	15	2.7	79
PA Plant Scrubber	883952	12	255	0.5	11	2.3	49
Thermic Fluid Heater	465430	62	693	171	1910	9.2	103
Boiler 6T/ Hr	44247	36	38	33	35	2.9	3
TOTAL		134	1747	205.5	1987	19.6	313

2. Malladi Drugs and Pharmaceuticals limited – Unit - 1:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
Boiler 4TPH	9971.2	52	10.37	75	14.95	10.6	2.11
Boiler 6 TPH	7656.5	79	12.08	4.0	0.612	11.5	1.760
Boiler 3.5 TPH	20473.7	49	20.06	0.5	0.204	7.1	2.90
TOTAL		180	42.51	79.5	15.766	29.2	6.77

3. Malladi Drugs and Pharmaceuticals limited – Unit - 3:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
Boiler 4TPH	7502	76	11.4	87	13.05	15.5	2.32
TOTAL		76	11.4	87	13.05	15.5	2.32

4. SVISS LABSS Pvt. Limited:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
Boiler Stack	3927	65	6.126	-	-	-	-
TOTAL		65	6.126				

5. Ultramarine & Pigments Limited:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
1.Pigment Plant stack	67212	131	8.80	85	5.71	5	0.34
2.Thermic Fluid Heater-1	1516	51	0.08	<0.5	-	3.2	0.00
3.Thermic Fluid Heater - 2	1519	50	0.08	<0.5	-	3.2	0.00
4.Spray Tower Plant	12549	47	0.59	43	0.54	2.9	0.04
5.Dry Mix Plant	3245	53	0.17	-	-	-	-
6.Boiler	33700	71	2.39	192	6.47	6.4	0.22
7.Sulphonation Plant	4007	29	0.12	149	0.60	1.7	0.01
8.Calcination Kiln	21600	122	2.64	<0.5	-	3.5	0.08
TOTAL		554	14.87	470.4	13.32	25.9	0.69

6. Ranipet SIDCO – CETP- Phase – 1.:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
Boiler	17665	104	1.83	<0.5	0.008	3.8	0.067
TOTAL	17665	104	1.83	<0.5	0.008	3.8	0.067

2018-2019

1. Thirumalai Chemicals Limited:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
Scrubber # 1 (PA Plant # 142)	1323600	05	159	0.5	16	0.31	10
Scrubber # 2 (PA Plant #144)	1225800	03	88	0.5	15	3.9	115
PA Plant Scrubber	883952	02	42	0.5	11	4.5	95
Thermic Fluid Heater	465430	51	570	171	1910	12.5	140
Boiler 6T/Hr	44247	36	38	30	32	2.5	3
TOTAL		97	897	202.5	1984	23.71	363

2. Malladi Drugs and Pharmaceuticals limited – Unit - 1:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
Boiler 4TPH	10649	82	17.46	21	4.47	12.5	2.66
Boiler 3.5 TPH	18671	64	23.89	11	4.10	7.3	2.73
TOTAL		146	41.35	32	8.57	19.8	5.39

3. Malladi Drugs and Pharmaceuticals limited – Unit - 3:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
Boiler 4TPH	6538	87	11.37	96	12.55	22.4	2.92
TOTAL		87	11.37	96	12.55	22.4	2.92

4. SVISS LABSS Pvt. Limited:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
Boiler Stack	4421	80	0.353	<0.5-	<0.5	6.1	0.26
TOTAL		80	0.353	<0.5-	<0.5	6.1	0.26

5. Ultramarine & Pigments Limited:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
1.Pigment Plant stack	73905	117	8.65	75	5.54	1.5	0.11
2.Thermic Fluid Heater-1	1861	59	0.11	<0.5	-	3.6	0.01
3.Thermic Fluid Heater - 2	1570	47	0.07	<0.5	-	3.6	0.01
4.Spray Tower Plant	14341	50	0.72	21	0.30	0.31	0.00
5.Dry Mix Plant	3408	58	0.20	-	-	-	-
6.Boiler	35418	71	2.51	171	6.06	8.4	0.30
7.Sulphonation Plant	3928	18	0.07	149	0.59	0.39	0.00
TOTAL		420	12.33	417	12.49	17.8	0.43

6. Ranipet SIDCO – CETP- – 1.:

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_x mg/Nm^3	Pollution load Kg/day
Boiler	17665	104	1.83	<0.5	0.008	3.8	0.067
TOTAL		104	1.83	0.5	0.008	3.8	0.067

2.6 Consolidated Stack Emission Load in CEPI Area:

Total Emission load to SIPCOT industrial complex, Ranipet from the Industries (2017- 2018)

Name of the unit contributing the Pollution load	Pollution load Kg/day		
	PM	SO_2	NOx
M/s Thirumalai Chemicals Limited:	1747	1987	313
Malladi Drugs and Pharmaceuticals limited – Unit - 1:	42.51	15.766	6.77
Malladi Drugs and Pharmaceuticals limited – Unit - 3	11.4	13.05	2.32
SVISS LABSS Pvt. Limited	6.126	--	--
Ultramarine & Pigments Limited	14.87	13.32	0.69
Ranipet SIDCO – CETP- Phase – I	1.83	0.008	0.067
TOTAL	**1,823.736**	**2,029.144**	**322.847**

i) Total Pollution load of PM emitted during the above period from the above major Industries in the Ranipet was 1,823.736 Kg/Day

ii) Total Pollution load of SO_2 emitted during the above period from the above major Industries in the Ranipet was 2,029.144 Kg/Day

iii) Total Pollution load of NOx emitted during the above period from the above major industries in the Ranipet was 322.847 Kg/Day

Total Emission load to SIPCOT industrial complex, Ranipet from the Industries (2018- 2019)

Name of the units contributed the Pollution load	Pollution load Kg/day		
	PM	SO_2	NOx
M/s Thirumalai Chemicals Limited:	897	1984	363
Malladi Drugs and Pharmaceuticals limited – Unit - 1	41.35	8.57	5.39
Malladi Drugs and Pharmaceuticals limited – Unit - 3	11.37	12.55	2.92
SVISS LABSS Pvt. Limited	0.353	0.5	0.26
Ultramarine & Pigments Limited	12.33	12.29	0.53
Ranipet SIDCO – CETP- Phase – I	1.83	0.008	0.067
TOTAL	**964.233**	**2,017.918**	**372.167**

i) Total Pollution load of PM of during the above period from the above major Industries in the Ranipet was 964.233 Kg/Day

ii) Total Pollution load of SO_2 during the above period from the above major. Industries in the Ranipet was 2,017.918 Kg/Day

iii) Total Pollution load of NOx during the above period from the above major industries in the Ranipet was 372.167 Kg/Day

2.7 Status of AAQ during November /December, 2019:

AMBIENT AIR QUALITY SURVEY REPORT – 2019 POST MONSOON PERIOD

Parameters	Mean Concentration	Vanapadi	Avarakkari	Sikkarajapuram	NAAQS*	Units
Particulate Matter (PM_{10})	70	86	67	57	100	$\mu g/m^3$
Particulate Matter ($PM_{2.5}$)	26.33	26	25	28	60	$\mu g/m^3$
Nickel (Ni)	0.025	0.029	0.015	0.032	20	ng/m^3

Particulate Matter (PM_{10})

Out of 3 samples all are well within the limits of NAAQ standards, also the mean concentration of PM_{10} is well within the limits of NAAQ standards.

Particulate Matter ($PM_{2.5}$):

Out of 3 samples all are well within the limits of NAAQ standards, also the mean concentration of $PM_{2.5}$ is well within the limits of NAAQ standards.

Nickel (Ni):

Out of 3 samples all are well within the limits of NAAQ standards, also the mean concentration of Ni is well within the limits of NAAQ standards.

2.8 Conclusion:

During CPCB CEPI 2018 AAQ monitoring got reported Nickel presence (max 34.8ng/m^3) in the AAQ and showed all places are exceedances. It has been thoroughly checked the sources of Nickel contribution to ambient air and found only the probable source is auto spray dust from dry tannery units. It has been collected the auto spray dust in different dry tanneries and analysed through ICP MS, the maximum nickel detected in the auto spray wet scrubber dust is 0.950 mg/kg. The auto spray operations are the wet process and the same is connected as well to wet scrubber so that the maximum particulate matter in the auto spray stack is 20 mg/m^3 and the operation is only 6 to 8 hours in a day. The expected concentration in the Nickel in AAQ is calculated as per the PM concentration in stack as well as the Nickel concentration in the wet scrubber sludge as follows;

For 10 HP Blower @ 2440 RPM

Particulate Matter (PM) in the Auto spray stack is 20 mg/m^3
The flow rate of the Auto spray stack is 7500 m^3/Hr
Particulate Matter Pollution Load = 20 mg/m^3 X 7500 m^3/Hr = 1, 50,000 mg/Hr
= 0.15 Kg/Hr
PM Load per day is 3.6 kg/day

Nickel Presence in the wet scrubber sludge is 0.950 mg/kg
Based on PM load
Nickel is 0.950 mg/Kg
PM is 3.6 Kg/Day
Nickel in PM load = 3.6 Kg of PM, Nickel presence is (3.6 Kg x 0.950 mg/Kg = 3.42 mg)
Nickel load to AAQ = 3.42 mg/ day

Nickel presence based on the particulate matter load is 3.42 mg per day is emitting into the atmosphere.

Ambient Air Quality Monitoring will be sampled at the flow rate of 1.2 m^3/min and total volume of the sample for 24 hours is 1728 m^3.

Based on the above data the expected ambient air quality Nickel concentration is 3.42 mg/1728m^3 = 1.98 µg/m^3.

It clearly indicates the Nickel presence in the ambient air is minimum based on the source of generation and emission. Also, the ambient air monitoring locations are fixed around 1 – 2 km away from these sources and proportionally dilution will take place due to dispersion. Based on that during 2019 CEPI Air quality monitoring, three additional Ambient Air Quality stations were identified in the CEPI impact area, in addition to the existing four sampling stations located in the core area. The 2019 AAQM survey results shows Nickel in all the locations are BDL. Also all the auto spray operations itself is wet process and followed by wet scrubber can completely remove the dust generation on this operation and PM concentration in the stack is almost nil.

3.0 WATER ENVIRONMENT:

3.1 Primary and Secondary Pollutants considered for SWEPI:

Primary Pollutant /Criteria Pollutant

Pollutant parameters such as Total Ammonia (NH4 + NH3) Nitrogen was selected as primary pollutant as considered in the CPCB report 2018.

Secondary Pollutant*:*

Pollutant parameters such as **Total Chromium, BOD** are selected based on toxins and as well as on concentration as considered in the CPCB report 2018.

3.2 Surface Water Quality Sampling Locations:

In the surface water, the concentration of Total Ammonical Nitrogen and BOD is the issue in the Surface water as per the CPCB report 2018. In addition to the existing four sampling stations located in the impact zone, four additional surface water sampling stations were identified in the CEPI Impact Zone which are as follow,

i) Pullinathangal Eri

ii) Puliankannu Eri

iii) Karai Eri

iv) Palar River (Arcot Bridge)

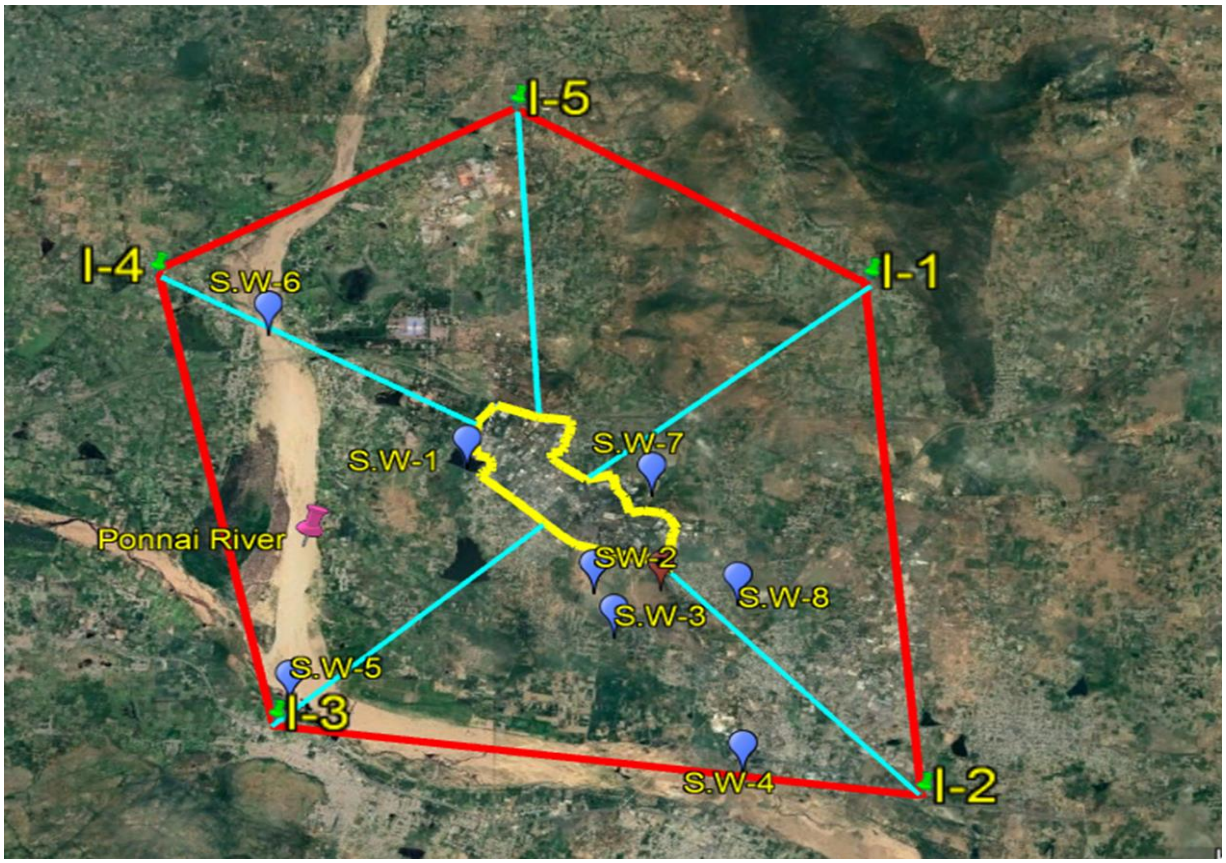
v) Palar River (GIT College Back side) – (Additional Point)

vi) Ponnai River (Sikkarajapuram) – (Additional Point)

vii) Vanapadi Lake– (Additional Point)

viii) Tandalam lake– (Additional Point)

Boundary Map showing sampling locations of Surface Water in CEPI Area



Locations of Surface Water Samples

S.No	Name of Location	Latitude	Longitude
SW-1	Pullinathangal Eri	12°57'48.9"N	79°17'39.2"E
SW-2	Puliankannu Eri	12°56'43.3"N	79°18'37.6"E
SW-3	KaraiEri	12°56'19.5"N	79°18'46.8"E
SW-4	Palar River (Aroct Bridge)	12°55'07.0"N	79°19'46.0"E
SW-5	Palar River (GIT College Back side) **(Additional Point)**	12°55'44.3"N	79°16'17.9"E
SW-6	Ponnai River (Sikkarajapuram) **(Additional Point)**	12°59'1.4"N	79°16'7.7"E
SW-7	Vanapadi Lake **(Additional Point)**	12°57'35.3"N	79°19'4.2"E
SW-8	Thandalam Lake **(Additional Point)**	12°56'36.8"N	79°19'43.7"E

3.3 Details of Effluents generation from major Industries located in CEPI Area:

The details of effluent generated from major industries are given below

S.No	Name of the Industry	Sources of Trade Effluent	Quantity KLD
1	Thirumalai Chemicals Limited	Manufacturing Process	220
2	Malladi Drugs and Pharmaceuticals limited – Unit - 1	From fermentation process and wash water	120
3	Malladi Drugs and Pharmaceuticals limited – Unit - 3	Production plant	11
4	SVISS LABSS Pvt. Limited	a) Boiler Blow down b) Cooling Tower Bleed off c) Floor and Lab Washings	1.2
5	Ultramarine & Pigments Limited	From Pigment, Surfactants & Utility operations	9.1
6	Ranipet SIDCO Finished Leather Effluent Treatment Company Limited – CETP- Phase – 1.	Trade Effluent Collection from Member Tanneries	1875
7	SIPCOT-SIDCO Phase-II Entrepreneur Finished Leather Effluent Treatment Co. (P) Ltd	Trade Effluent Collection from Member Tanneries	700
TOTAL EFFLUENT GENERATION			**2936.3**

The details of mode of disposal treated trade effluent and sewage by the individual industries:

Sl. No	Name of the Industry	Effluent /Sewage	Quantity Reused in their process/ Zero Liquid Discharge. KLD
1	Thirumalai Chemicals Limited	Trade Effluent	220 KLD - ZLD
		Sewage	13 KLD - Gardening
2	Malladi Drugs and Pharmaceuticals limited – Unit – 1	Trade Effluent	58 KLD - Boiler/garden 53 KLD - Cooling tower make up 9 KLD – Bio Compositing and Co processing in Cement plant
		Sewage	4.0 KLD
3	Malladi Drugs and Pharmaceuticals limited – Unit – 3	Trade Effluent	5 KLD - To Boiler 6 KLD – To Cooling Tower
		Sewage	1.4 KLD - Garden
4	SVISS LABSS Pvt. Limited	Trade Effluent	1.2 KLD – Solar Evaporation Pan
		Sewage	3.0 KLD

5	Ultramarine & Pigments Limited	Trade Effluent	9.1 KLD reused in the process using RO, MEE & VTFD & ensuring ZLD
		Sewage	4.5 KLD reused for green belt development using STP of 30 KLD.
6	Ranipet SIDCO Finished Leather Effluent Treatment Company Limited – CETP- Phase – 1.	Trade Effluent	1875 KLD reused in the process by member industries
7	SIPCOT-SIDCO Phase-II Entrepreneur Finished Leather Effluent Treatment Co. (P) Ltd	Trade Effluent	700 KLD reused in process by member industries.
Total Sewage treated			**25.9**
Total Treaded effluent treated (ZLD)			**2936.3**

Total quantity of trade effluent generated – 2,936.3 KLD

Total quantity of ZLD System provided – 2,936.3 KLD

Total quantity of effluent discharged outside – “Zero” KLD

Total quantity of Sewage generated – 25.9 KLD

Total quantity of sewage treated and reused for green belt development – 25.9 KLD

Total quantity of sewage discharged outside – “Zero” KLD

No disposal of treated trade effluent and treated sewage in to the nearby water bodies from the industries.

3.4 Domestic Waste Water Generation and Disposal in CEPI Area:

The details of domestic waste water generation from the nearby habitations and disposal in to the water bodies in the CEPI area are given below

S.No	Name of the Town / Municipality	Quantity of untreated sewage discharged in to River Palar (MLD)
1	Melvisharam Municipality	4.0
2	Arcot Municipality	5.0
3	Ranipet Municipality	4.5

No Common Sewage Treatment system is provided in all the three municipalities, and entire untreated sewage is discharged into River Palar.

3.5 Industrial and Domestic Waste Water impact on Surface Water bodies:

All the 17 category units, Common Effluent Treatment Plants (CETPs), Red and Orange Large/medium units have installed Zero Liquid Discharge System to achieve Zero Discharge Liquid and there is no discharge of effluent either directly or indirectly into the nearby water bodies.

The industries who don't have sewage treatment plants have made provision for disposing the domestic sewage into septic tank and soak pits.

The intrusion of untreated sewage discharged into the water bodies from the nearby habitations/Towns such as Melvisharam, Arcot, Ranipet Municipalities may cause the BOD load/ the presence of Total Ammonical Nitrogen in the River, since there is no underground sewerage system and common sewage treatment facility is provided in all the three municipalities, and the entire untreated sewage is discharged into River Palar.

Further, it is to mention that, there are local bodies abetting the industrial area. The domestic sewage generated from these local bodies also enters the industrial area through storm water drains passing through the industrial area and joins nearby lakes.

3.6 Common Treatment Facilities details:

There are two tannery CETP's located in the CEPI area to collect, treat the primarily treated effluent from their 99-member tannery units. The CETP's have Zero Liquid Discharge (ZLD) system and the entire treated trade effluent (i.e RO permeate and evaporator condensate) was recycle back to the member tanneries for process. The flow meters provided at various unit operations of the CETP are connected with online continuous monitoring system of TNPCB/ CPCB web portal.

3.7 Status of Surface Water Quality in 2018 in CEPI Area:

SURFACE WATER QUALITY REPORT – 2018 POST MONSOON PERIOD

S.NO	PARAMETERS	UNITS	Mean Concentration	No of Samples exceeding	Total No of Samples	CPCB Water Quality Requirements Standards MINARS-17/2001-02
1	Total Ammonia (NH4+NH3)-Nitrogen	mg/l	30.0	9	12	1
2	Bio Chemical Oxygen Demand (BOD) 3 days at 27°C	mg/l	63.0	9	12	8
3	Total Chromium	mg/l	0.23	9	12	0.1

1. **Total Ammonia) (NH4 + NH3)- Nitrogen:**

   Out of 12 samples 9 samples are exceeding the standards of MINARS-17/2001-02 and only 3 samples are within the limits of MINARS-17/2001-02 standards.

2. **BOD**

   Out of 12 samples 9 samples are exceeding the standards of MINARS-17/2001-02 and only 3 samples are within the limits of MINARS-17/2001-02 standards.

3. **Total Chromium**

   Out of 12 samples 9 samples are exceeding the standards of MINARS-17/2001-02 and only 3 samples are within the limits of MINARS-17/2001-02 standards.

3.8 Status of Surface Water Quality during November /December, 2019:

SURFACE WATER QUALITY REPORT – 2019 POST MONSOON PERIOD

S.NO	PARAMETERS	UNITS	Sampling location & Results								Mean Concentration	CPCB Water Quality Requirements Standards MINARS - 17/2001-02
			River –Arcot Down	River – Melvisharam Up	Ponnai River – Sikkarajapuram Up Stream	Puliyagannu Lake	Karai Lake	Pullinathangal Lake	Vanapadi Lake	Tandalam Lake		
1	**Total Ammonia (NH4+NH3) Nitrogen**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
2	**Bio chemical Oxygen Demand (BOD) 3 days at 27°C**	mg/l	6	11	8	-	-	-	-	-	8.33	8
3	**Total Chromium**	mg/l	0.011	0.06	0.004	0.46	0.15	0.71	0.007	0.016	0.1705	0.1

1) Total Ammonia (NH4 + NH3)- Nitrogen:

Out of 8 samples all are within the limits of MINAR – 17/2001-02 standards, also the mean concentration is well within the limits of MINAR – 17/2001-02 standards.

2) Biochemical Oxygen Demand:

Out of 3 samples one sample exceeding the limits of MINAR – 17/2001-02 standards and the mean concentration is exceeding the limits of MINAR – 17/2001-02 standards.

Biochemical Oxygen Demand was considered in running water i.e. in River water samples only and found to be exceeded at 1 location and within the standard (8 mg/l.) at 2 locations. Biochemical Oxygen Demand parameter was not considered for stagnated water i.e. for lake water. BOD standard is compared with IS 10500:2012 standard whereas there is no standard for BOD and the standards BOD is available only for wastewater. During the sampling, the lake samples are not having any flow and totally stagnated (concentrated) and hence the BOD value shows high may be due to domestic waste water and other local contamination.

From the results, it reveals that the intrusion of untreated sewage discharged into the water bodies from the nearby habitations/Towns may cause the BOD load in the River.

No common sewage treatment system is provided in all the three municipalities, and entire untreated sewage is discharged into River Palar.

3) <u>Total Chromium:</u>

Out of 8 samples 3 samples exceeding the limits of MINAR – 17/2001-02 standards and the mean concentration is exceeding the limits of MINAR – 17/2001-02 standards,

3.9 Conclusion:

The presence of Total Coliform, Fecal Coliforms and Anionic Surfactants in the CPCB report 2018 reveals that the intrusion of untreated sewage from nearby Towns/Municipalities causes BOD Load in the river and the concentration of Total Ammonical Nitrogen due to further putrefaction of organic matters (BOD Load).

It is also inferred that the presence of Total Ammonical Nitrogen in the surface water is mainly due to the intrusion of untreated domestic waste water from the nearby habitations and there is no discharge of Industrial effluents.

4.0 LAND ENVIRONMENT

4.1 Primary and Secondary Pollutants considered for GWEPI:

Primary Pollutant /Criteria Pollutant

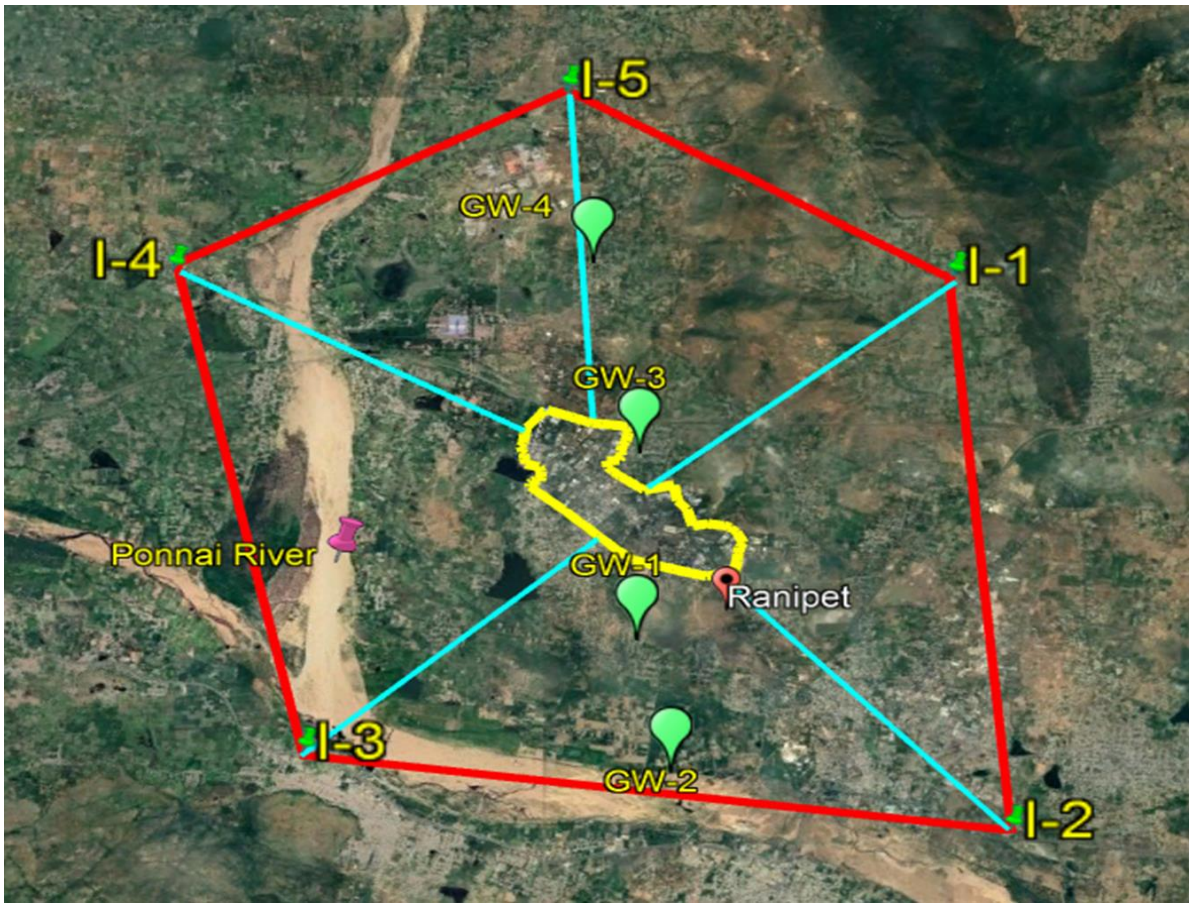
Pollutant parameters such as **Total Phosphorus (TP)** was selected as primary pollutant as considered in the CPCB report 2018.

Secondary Pollutant:

Pollutant parameters such as Total hardness, Iron are selected based on toxins and as well as on concentration as considered in the CPCB report 2018.

4.2 Ground Water Quality Sampling Locations:

Boundary Map showing sampling locations of Ground Water in CEPI Area



Locations of Ground water samples

Ground Water:

S.No	Location Names	Latitude	Longitude
GW-1	Pulliankannu Village	12°56'30.2"N	79°18'30.7"E
GW-2	Ranipet Pump House	12°55'24.7"N	79°18'45.0"E
GW-3	Narasinghapuram	12°58'03.0"N	79°16'45.0"E
GW-4	Lalapet	12°59'37.2"N	79°18'12.3"E

4.3 Status of Ground Water at sampling locations in 2018:

GROUND WATER QUALITY REPORT – 2018 POST MONSOON PERIOD:

S. No	Parameter	Unit	Mean Concentration	No of Samples exceeding	Total No of Samples	IS 10500:2012 Drinking water Standards
1	Total Phosphorus	mg/l	0.272	3	12	0.3
2	Total Hardness	mg/l	492	0	12	600
3	Iron	mg/l	0.192	3	12	0.3

1. **Total Phosphorus**

   Out of 12 samples 3 samples exceeding the limits of 10500:2012 drinking water standards and 9 samples are within the limits of 10500:2012 drinking water standards and the mean concentration of Total phosphorus is within the limits of 10500:2012 drinking water standards.

2. **Total Hardness**

   Out of 12 samples all are within the limits of 10500:2012 drinking water standards and the mean concentration of Total Hardness is within in the limits of 10500:2012 drinking water standards.

3. **Iron**

   Out of 12 samples 3 samples exceeding the limits of 10500:2012 drinking water standards and 9 samples are within the limits of 10500:2012 drinking water standards and the mean concentration of Iron is within the limits of 10500:2012 drinking water standards.

4.4 Status of Ground Water Quality during November/December, 2019:

GROUND WATERQUALITY REPORT – 2019 POST MONSOON PERIOD:

No	Parameter	Unit	Sampling Locations & Results				Mean Concentration	IS 10500: 2012 Drinking water Standards
			Pulliankannu Village	Ranipet Pump House, Ranipet	Narshingapuram Village	Lalapet Village		
1	**Total Phosphors**	mg/l	0.095	0.773	0.0667	0.153	0.27	0.3
2	**Total Hardness**	mg/l	537	509.67	423	496.67	492	600
3	**Iron**	mg/l	0.648	0.12	BDL	BDL	0.19	0.3

1. **Total Phosphorus**

   Out of 4 samples one sample exceeding the limits of IS 10500:2012 drinking water standards and 3 samples are within the limits of IS 10500:2012 drinking water standards and the mean concentration of Total phosphorus is within the limits of IS 10500:2012 drinking water standards .

2. **Total Hardness:**

   Out of 4 samples all are within the limits of IS 10500:2012 drinking water standards and the mean concentration of Total Hardness is within in the limits of IS 10500:2012 drinking water standards.

3. **Iron**

   Out of 4 samples one sample exceeding the limits of IS 10500:2012 drinking water standards and 3 samples are within the limits of IS 10500:2012 drinking water standards and the mean concentration of Iron is within the limits of IS 10500:2012 drinking water standards.

4.5 Management of Hazardous Waste in CEPI Area

Hazardous Waste:

All Industries in SIPCOT has been issued with Authorization under Hazardous Waste Management Rules. The wastes generated from the units are disposed to secured landfill TSDF at Gummudipoondi /Authorized Recyclers/Cement industries for Co-processing.

The details of the individual industries for 2017-18 & 2018 -19 are listed as below.

Hazardous Waste 2017-18

1. Thirumalai Chemicals Limited:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2017-18	Treatment & disposal mechanism
Tarry Residue	1.2	15	12.9	Disposed to M/S. TNWML, Gummudipoondi
Used/Spent Oil	5.1	5.4	1.98	Disposed to M/S. Sun Reclaimery, Madurai
Molybdenum & Vanadium Compounds	B5 & B8	0.100	0.00	Disposed to M/S. TNWML Gummudipoondi
Chemical Sludge from Wastewater treatment	34.3 (Old) 35.3 (New)	124	69.46	Disposed to M/S. TNWML Gummudipoondi

2. Malladi Drugs and Pharmaceuticals limited – Unit - 1:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2017-18	Treatment & disposal mechanism
Used oil	5.1	1.2	0.186	Recycle/Reuse
Spent carbon	28.3	1.44	1.322	Incineration by TWML

3. Malladi Drugs and Pharmaceuticals limited – Unit - 3:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2017-18	Treatment & disposal mechanism
Used oil	5.1	0.6	0.223	Recycle/Reuse
Spent carbon	28.3	0.6	0.233	Incineration by TWML

4. SVISS LABSS Pvt. Limited:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2017-18	Treatment & disposal mechanism
Waste or Residue Contained Oil	5.2	0.05	0.041	Incineration by TWML
Distillation Residue	20.3	0.42	nil	Incineration by TWML
Empty Bags contaminated with Hazardous Chemicals	33.1	4.5	3.527	Incineration by TWML
Empty Barrels contaminated with Hazardous Chemicals	33.1	4.5	3.877	Incineration by TWML
Chemical Sludge from Waste water treatment	35.3	0.043	0.039	Disposed to M/S. TNWML Gummudipoondi

5. Ultramarine & Pigments Limited:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2017-18	Treatment & disposal mechanism
Used Oil	5.1	4.5	0.1337	To Authorized Recyclers
Waste / Residues containing oil	5.2	1.2	0.0469	To GEPIL
Residues /dust / filter cakes	17.1	6.0	0.214	To TSDF, Gummudipoondi
Discarded Containers/ liners/ barrels	33.3	1.2	Nil	To TSDF for incineration
Vanadium Compounds	Sch. II – Class B 8	0.2	Nil	To Manufacturer

6. Ranipet SIDCO – CETP- Phase – 1.:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2017-18	Treatment & disposal mechanism
CETP SLUDGE	35.3	6060/T	4309.0	Disposal to TWML

7. Ranipet SIDCO – CETP- Phase – II.:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2017-18	Treatment & disposal mechanism
CETP SLUDGE	35.3	255	469.2	SLF Inside the CETP premises
MEE-SALT	37.3	Applied	117.0	Impervious surface Roofed shed

Hazardous Waste 2018-19

1. Thirumalai Chemicals Limited:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2018-19	Treatment & disposal mechanism
Tarry Residue	1.2	15	12.065	Disposed to M/S. TNWML, Gummudipoondi
Used/Spent Oil	5.1	5.4	1.800	Disposed to M/S. Sun Reclaimery, Madurai
Molybdenum & Vanadium Compounds	B5 & B8	0.100	0.037	Disposed to M/S. TNWML Gummudipoondi
Chemical Sludge from Wastewater treatment	34.3 (Old) 35.3 (New)	124	71.236	Disposed to M/S. TNWML Gummudipoondi

2. Malladi Drugs and Pharmaceuticals limited – Unit - 1:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2018-19	Treatment & disposal mechanism
Used oil	5.1	1.2	0.255	Recycle/Reuse
Spent carbon	28.3	1.44	1.485	Incineration by TWML

3. Malladi Drugs and Pharmaceuticals limited – Unit - 3:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2018-19	Treatment & disposal mechanism
Used oil	5.1	0.6	0.233	Recycle/Reuse
Spent carbon	28.3	0.6	0.241	Incineration by TWML

4. SVISS LABSS Pvt. Limited:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2018-19	Treatment & disposal mechanism
Waste or Residue Contained Oil	5.2	0.05	0.048	Incineration by TWML
Distillation Residue	20.3	0.42	0	Incineration by TWML
Empty Bags contaminated with Hazardous Chemicals	33.1	4.5	4.44	Incineration by TWML
Empty Barrels contaminated with Hazardous Chemicals	33.1	4.5	2.22	Incineration by TWML
Chemical Sludge from Waste water treatment	35.3	0.043	0.035	Disposed to M/S. TNWML Gummudipoondi

5. Ultramarine & Pigments Limited:

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2018-19	Treatment & disposal mechanism
Used Oil	5.1	4.5	0.0288	To Authorized Recyclers
Waste / Residues containing oil	5.2	1.2	0.040	To GEPIL
Residues /dust / filter cakes	17.1	6.0	0.0618	To TSDF, Gummudipoondi
Discarded Containers/ liners/ barrels	33.3	1.2	Nil	To TSDF for incineration
Vanadium Compounds	Sch. II – Class B 8	0.2	Nil	To Manufacturer

6. Ranipet SIDCO – CETP- Phase – 1.

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2017-18	Treatment & disposal mechanism
CETP SLUDGE	35.3	6060	4951.2	Disposal to TWML

7. Ranipet SIDCO – CETP- Phase – II.

Name	Category	Authorized Quantity MT/Annum	Waste Generation Tons/year 2017-18	Treatment & disposal mechanism
CETP SLUDGE	35.3	255	469.2	SLF Inside the CETP premises
MEE-SALT	37.3	Applied	117.0	Impervious surfaced Roofed shed

All the 17 category industries, Red and orange category units are collecting the hazardous waste generated from the operations are stored in the closed shed with impervious platform and disposed to authorized recyclers then there without any accumulation. In respect of member tannery units, the sludge generated from Preliminary Treatment System is being collected and stored in the closed shed and that too disposed to CETPs for further disposal. The sludge generated from the CETPs and member tannery units are stored in the sludge storage tanks and further disposed to cement kilns for Co-processing and TSDF Gummudipoondi for Secure Land fill. The leachate

generated from the sludge storage tanks are collected through leachate collection system provided in the sludge storage tanks and further sent to treatment process in the CETP. Hence there is no discharge / seepage from hazardous waste storage facility in to storm water drain /water bodies and on land.

4.6 Management of Bio-Medical Waste in CEPI Area:

Bio-medical waste:

There are no major Hospitals located in the SIPCOT Industrial Estate. However, the bio-medical waste generated in the impact area is handed over to the Common Bio Medical Waste treatment facility for final treatment and disposal.

4.7 Management of Municipal Solid Waste in CEPI Area:

Municipal Solid Waste/Domestic Waste:

There is no Municipal Solid Waste disposal facility within SIPCOT industrial areas and as well as for nearby residential areas like Karai, Puliyakannu and others. The municipal solid waste is being unscientifically dumped on the roadsides in the industrial area, and banks of water bodies nearby were noticed. TNPCB is working with local bodies for taking necessary action in this regard and also during the meetings conducted at Board Office. The proper scientific way of door to door collection, segregation, disposal facilities is to be provided so as to improve the status of air Quality, ground water quality and general aesthetic condition of industrial areas.

4.8 Details of STPs/ETPs/CETPs:

1.Thirumalai Chemicals Limited: "ZLD Unit"

Name of the Treatment Unit	No. of Units	Dimension (m)
Bar Screen	1	0.5 X 2.0 X 0.5
Oil and Grease trap (Manual)	1	2.0 X 4.0 X 1.5
Equalization Tank	1	11 X 11 X 2.5
Neutralization Tank	1	2.6 X 2.6 X 2.6
Primary Clarifier	1	6.0 X 2.5 SWD
Anaerobic Filter	2	17.5 X 34 X 4 TH
Pre Aeration Tank	1	8 X 8 X 2.8
Clariflocculator	1	9 X 2.7 SWD
Submerged Aerobic Filter	1	9.8 X 29.8 X 3.7
Aeration Tank	1	19.05 X 9.4 X 2.42

Secondary Clarifier	1	8 X 2.5 SWD
Chlorine Contact Tank	1	2.0 X 4.0 X 1.5 SWD
Sludge Thickener	1	6.0 X 2.5 SWD
Final Bar Screen	1	1.0 X 2.0 X 1.0 SWD
Final Oil and Grease Trap	1	4.5 X 9.0 X 2.0 SWD
Blending Tank	1	7.5 X 7.5 X 2.0 SWD
Filter Press	1	23 Plates
Collection Cum reaction tank	2	7 X 7 X 3.5
Chlorination Vessel	1	-
Filter Press	1	35 Plates
Collection tank	1	4 X 4 X 4
Dosing tanks	3	200 L cap
Reverse Osmosis Unit	1	200 KLD
R.O. First Stage	12	8 X 39.3 Inch
R.O. Second Stage	6	8 X 39.3 Inch
RO Rejects Collection Tank	1	-
RO Rejects Receiving Tank	1	-
MEE (Triple Effect)	1	50 KLD
Crystallizer	1	-
Basket Centrifuge	1	250 Kgs. Cap
Centrifuge ML Collection Tank	1	-
ATFD	1	12 m3/day

STP

Name of the Treatment Unit	No. of Units	Dimension (m)
Bar Screen	1	0.74 X 0.24 X 0.90
Raw Sewage Collection Sump	1	6.10 X 4.10 X 2.04
Bio Aeration Tank	1	3.68 X 2.90 X 2.30
Secondary Settling Tank	1	1.5 X 1.5 X 0.68
Final Feed Collection Tank	1	1.5 X 1.5 X 0.68
Pressure Sand Filter	1	1.63 X 0.62
Activated Carbon Filter	1	1.63 X 0.62
Sludge Drying Bed	2	0.54 X 0.48 X 0.90
Final Tank	1	2.13 X 1.62

2. Malladi Drugs and Pharmaceuticals limited – Unit - 1: "ZLD Unit"

S.No	Name of the Treatment Unit	No. of Units	Dimension
1	Yeast settling tank	2	14 m X 5 m X 5 m
2	Bio reactor	1	19.8 m dia.* 10 m H
3	RO plant	2	165 KLD 2 stages
4	Multiple Effect Evaporation System	1	10000 Kg/Hr 5 stages
5	Triple Effect Evaporation System - 1	1	2176 Kg/Hr 3 Stages
6	Triple Effect Evaporation System - 2	1	2170 kg/Hr 3 stages
7	Condensate treatment system - FICCO	1	6.7mX7.7M5.7M

STP

Name of the Treatment Unit	No. of Units	Dimension
FAB aeration system	1	1.25mX1.25mX2.5m
Settling tank	1	1mX1.25X1.25m
Filter Feed tank	1	0.7mX1.25mX1.25m
Dual media filter	1	0.3 m Dia X 1.5 m Ht.
Disinfection system	1	1000 liters per hour
Sludge Dewatering system	2	1mX1mX1m

3. Malladi Drugs and Pharmaceuticals limited – Unit - 3: "ZLD Unit"

S.No	Name of the Treatment Unit	No. of Units	Dimension
1	Equalization Tank	1	4 m X 7 m X 4.3 m
2	Aeration process	1	4mX7mX5m
3	Double Effect evaporation	1	165 KLD 2 stages
4	Forced circulation Evaporation System -1	1	2100 Kg
5	Forced Circulation Evaporation System -2	1	5722 Kg/Hr 3
6	Agitated Thin film Dryer	1	1.2DX6.72H

STP

Name of the Treatment Unit	No. of Units	Dimension
FAB aeration system	1	1.25mX1.25mX2.5m
Settling tank	1	1mX1.25X1.25m
Filter Feed tank	1	0.7mX1.25mX1.25m
Dual media filter	1	0.3 m Dia X 1.5 mH
Disinfection system	1	1000 liters per hour
Sludge Dewatering system	2	1mX1mX1m

4. SVISS LABSS Pvt. Limited: "ZLD Unit"

S.No	Name of the Treatment Unit	No. of Units	Dimension
1	Collection Sump-I	1	3.0 x 2.0 x 1.1
2	Collection Tank	1	4.0 x 4.0 x 2.4
3	Neutralization Tank	1	3.5 x 2.5 x 1.8
4	Settling Tank	1	1.9 x 1.9 x 1.2
5	Sludge Drying Bed	2	2.7 x 1.7 x 1.3
6	Solar Evaporation Pond – 1	1	11.5 x 9.2 x 0.6
7	Solar Evaporation Pond – 2	1	12.5 x 7.1 x 0.6
8	Solar Evaporation Pond – 3	1	7.1 x 4.1 x 0.6
9	Solar Evaporation Pond – 4	1	8.0 x 8.0 x 0.3

5. Ultramarine & Pigments Limited: "ZLD Unit"

S.No	Name of the Treatment Unit	No. of Units	Dimension
1	RO plant -1	1	6 m3 /hr
2	RO plant - 3	1	4 m3 / hr
3	Multiple Effect Evaporator of 3 stages	1	60 KLD
4	Vertical Thin Film Dryer (VTFD)	1	12.9 KLD

STP

S.No	Name of the Treatment Unit	No. of Units	Dimension
1	Collection Tank	1	6.0 x 4.0 x 2.6 m
2	Bio Aeration Tank	1	4.7 x 2.5 x 3.7 m
3	Settling Tank	1	2.2 x 2.5 x 3.7 m
4	Filter Feed Tank	1	2.2 x 2.5 x 3.7 m
5	Treated Water Tank	1	2.2 x 2.5 x 3.7 m
6	Activated Carbon filter	1	0.5 x 1.5 m
7	Pressure Sand Filter	1	0.5x 1.5 m

6. Ranipet SIDCO – CETP- Phase – I.: "ZLD Unit"

S.No	Name of the Treatment Unit	No. of Units	Dimension
1	Receiving Sump	1	8mφ X 5.5m TD
2	Equalization Tank	1	30mφ X 3.5m
3	Flash Mixer I	1	1.2m X 1.2m X 1.5m
4	Flash Mixer – 2	1	1.2m X 1.2m X 1.5m
5	Clariflocculator	1	16mφ X 3m SWD
6	Aeration Tank I	1	31m X 31m X 4 m TD
7	Aeration Tank II	1	31m X 31m X 4 m TD
8	Secondary clarifier	1	14mφ X 3m SWD
9	Sludge well	1	4m φ X 5m TD
10	Sludge Drying Beds	1	20m X 15m X 1.5 TD (8 No's)
11	Filter Press	2	2T & 3 T cycle
12	RC Collection well	1	9mφ X 2.5m SWD
13	Reactor Clarifier (RC)	1	14mφ X 3.5m SWD
14	Filter Feed Tank	1	3.4m X 10.0m X 2.5m SWD
15	Multigrade Filter I	1	2.6m X 2.3m HOS
16	Multigrade Filter II	1	2.6m X 2.3m HOS
17	Ultra Filtration	1	80 Modules
18	RO I feed Tank	1	7.0m X 7.0m X3.0m SWD
19	Organic Scavenger (OS)	1	2.4mφ X 2.0m HOS
20	Reverse Osmosis (RO III)feed tank	1	7.5M X 6.0M x 3.30 SWD
21	Reverse Osmosis I	1	120KL/hr(120 membrane)
22	Reverse Osmosis II	1	50KL(60membrane)
23	Reverse Osmosis III	1	40KL/hr(78 membrane)
24	RO Permeate tank	1	12.75m X 12.75m X 3.1 SWD
25	Overhead Tank	1	13m φ X 3.6m TD
26	RO Reject tank	1	10m X7m X 2.6m SWD
27	Boiler Shed (Boiler 5TPH)	1	20m X 8m X 7.5m HT
28	Evaporator (7 Stage Evaporator)	1	600 KL/Day (20m X 12m)
29	Boiler Chimney	1	34.5m HT
30	SLF	1	45.50 X 22 X 4.5
31	Salt recovery Shed	1	65 Feet x 135 Feet.

7. Ranipet SIDCO – CETP- Phase – II.: "ZLD Unit"

S. No.	Name of the Treatment Unit	No. of Units	Dimensions in metres
1.	Bar screen	1	0.5x2x0.6
2.	Equalisation tank	1	21 m diax2.5
3.	Flash mixer tank	1	1.25x1.25x1.5
4.	Lime dosing tank	1	1.2x1.2x1.5
5.	Alum mixing tank	2	1.8x1.8x1.5
6.	Primary Clarifier tank	1	10 m dia x2.8
7.	Aeration Tank	1	28x28x3.3
8.	Secondary clarifier	1	12 m dia x 2.8
9.	Reactor Clarifier tank	1	8m dia. X3.3
10.	Soda ash dosing tank	1	2x2x2.8
11.	Lime dosing tank	2	1.5x1.5x3
12.	Filter feed tank	1	5 x 5 X 5
13.	Multi grade filters	2	1.8m dia.x2.8
14.	Filter Press	1	1.5x 1.5 x 52 plates
15.	Sludge holding tank	1	3x3x2.3
16.	Sludge disposal sump	1	5 diax1.65
17.	U F Feed tank	1	4.5x4.0x2.3
18.	U F Permeate tank	1	6.5x4.0x2.3
19.	Organic scavavenger	2	1.0m dia. X1.5
20.	O.S. Regeneration tank	2	1.0x1.0x1.3
21.	R.O.Permeate tank	1	10.5x4.0x2.3
22.	R.O.Reject tank	1	1.8x4.0x2.3
23.	R.O.Reject tank-2	1	800KLD capacity
24.	R.O.I stage membranes	1	8" x 40" -72 no
25.	R.O.II stage membranes	1	8" x 40" -24 no
26.	Boiler	1	1.5T/Hr
27.	5 MEE (3 Falling Film + 2 Forced Circulation)	1	175 KLD Capacity
28.	R.O.Permeate Over head tank	1	15x9x3.3
29.	S.L.F	1	50X25X3
30.	Salt storage shed	1	36.57 x 14.94

4.9 Conclusion:

All the ground water samples are found within the limits except Total Phosphorus & Iron at 1 location. The ground water CEPI score found to be normal. Further the Hazardous wastes, Bio medical wastes are properly collected, stored and disposed in scientific manner and hence there is no discharge / seepage from hazardous waste storage facility in to storm water drain /water bodies and on land.

5.0 HEALTH STATISTICS

5.1 Hospitals details in CEPI Area:

1. Government Primary Health Centre - Ammoor (H1)
2. Government Primary Health Centre – Lalapet (H2)
3. Christian Medical College (H3)
4. Apollo KH Hospital – Melvisharam (H4)
5. Bharat Heavy Electricl Limited – Ranipet (H5)

5.2 Health data of five years:

2016-17 & 2017-18

H-1: - Govt. Primary Healthy Centre –Ammoor

AIR BORNE

TYPE OF DISEASE	2016-17	2017-18	% Increase	Remarks
Asthma	330	342	-	-
Acute respiratory Infection	1169	1108	-	-
Bronchitis	-	-	-	-
Cancer	-	-	-	-
Total	**1499**	**1450**	**-3.27(<5 %)**	**Decrease**

WATER BORNE

TYPE OF DISEASE	2016-17	2017-18	% Increase	Remarks
Gastroenteritis	--	--	-	-
Diarrhea	340	356	-	-
Renal disease	5	2	-	-
Cancer	-	-	-	-
Total	**345**	**358**	**3.76 (<5%)**	**Increase**

H-2: - Govt Primary HEALTH CENTRE – LALAPET

AIR BORNE

TYPE OF DISEASE	2016-17	2017-18	% Increase	Remarks
Asthma	2340	2548	-	-
Acute respiratory Infection	5665	5460	-	-
Bronchitis	465	364	-	-
Cancer	-	2	-	-
Total	**8470**	**8374**	**-1.13 (<5%)**	**Decrease**

WATER BORNE

TYPE OF DISEASE	2016-17	2017-18	% Increase	Remarks
Gastroenteritis	1610	1496	-	-
Diarrhea	465	364	-	-
Renal disease	1	4	-	-
Cancer	1	2	-	-
Total	**2077**	**1866**	**-10.15**(<5%)	**Decrease**

H-3: - CHRISTIAN MEDICAL COLLEGGE CMC – VELLORE

AIR BORNE

TYPE OF DISEASE	2016-17	2017-18	% Increase	Remarks
Asthma	15	16	-	-
Acute respiratory Infection	15	9	-	-
Bronchitis	-	-	-	-
Cancer	10	6	-	-
Total	**40**	**31**	**-22.5 (<5%)**	**Decrease**

WATER BORNE

TYPE OF DISEASE	2016-17	2017-18	% Increase	Remarks
Gastroenteritis	16	7	-	-
Diarrhea	16	7	-	-
Renal disease	8	22	-	-
Cancer	10	6	-	-
Total	**50**	**42**	**-16**(<5%)	**Decrease**

H-4: - Apollo HK Hospital – Melvisharam

AIR BORNE

TYPE OF DISEASE	2016-17	2017-18	% Increase	Remarks
Asthma	357	340	-	-
Acute respiratory Infection	12,400	11,786	-	-
Bronchitis	590	680	-	-
Cancer	357	340	-	-
Total	**13,347**	**12,806**	**- 4.0(<5%)**	**Decrease**

WATER BORNE

TYPE OF DISEASE	2016-17	2017-18	% Increase	Remarks
Gastroenteritis	1,450	1,348	-	-
Diarrhea	162	296	-	-
Renal disease	7,583	7,770	-	-
Cancer	-	7	-	-
Total	**9,195**	**9,421**	**2.45(<5%)**	**Increase**

H-5: - BHEL – Ranipet

AIR BORNE

TYPE OF DISEASE	2016-17	2017-18	% Increase	Remarks
Asthma	85	115	-	-
Acute respiratory Infection	26525	26200	-	-
Bronchitis	10800	10600	-	-
Cancer	2	1	-	-
Total	**37,412**	**36,916**	**- 1.32**(<5%)	**Decrease**

WATER BORNE

TYPE OF DISEASE	2016-17	2017-18	% Increase	Remarks
Gastroenteritis	975	1000	-	-
Diarrhea	400	415	-	-
Renal disease	11	7	-	-
Cancer	-	1	-	-
Total	**1,386**	**1,423**	**-2.66** (<5%)	**Decrease**

5.3 Analysis of data & Conclusion:

From analysing the health data collected from the five hospitals, it is observed that there is a decreasing trend of less than 5% in Air and water borne disease cases considered in the consecutive years of (2016 – 17 and 2017- 18). Hence the score for receptor (C) is considered as zero for Air, Water and Land Environment.

6.0 ACTION TAKEN DURING 2018-19 & 2019-20:

6.1 Action Taken by the Industries in CEPI Area for the improvement of Pollution Control Measures:

The regional office of Tamilnadu Pollution Control Board has taken various initiatives in reducing the CEPI Score of 81.79 of 2009 to 40.72 of 2019 Post Monsoon. Below mentioned are some of the efforts:

- All the 17 category units, Common Effluent Treatment Plants (CETPs) and Red Large units have installed Zero Liquid Discharge System to achieve Zero Discharge Liquid.

Period - 2016-17

1. Thirumalai Chemicals Limited:

1. M/s. Thirumalai Chemicals Ltd., has installed post bed catalyst for the reactors of PA1, PA2, & PA3 to minimise CO emission and distillation residue generation.
2. M/S Thirumalai Chemicals Ltd., has installed “Multiple Effect Evaporator” to evaporate RO reject to ensure “Zero Liquid Discharge.
3. M/S Thirumalai Chemicals Ltd., also installed “Condensate Polishing Unit” to reuse the condensate water.
4. Provision of new PSF and ACF at the outlet of treated effluent.
5. Sludge removal from Anaerobic Compartment 1 & 2

2. Malladi Drugs and Pharmaceuticals limited – Unit - 1:

1. M/S Malladi Drugs and Pharmaceuticals Ltd., Unit – 1, has installed “Triple Effect Evaporator” to Concentrate MEE reject to about 50 % concentration and sending the same to Cement Industries for co processing there by the unit has eliminated the bio compositing process.
2. Spent Wash 1825 MT disposed through Co. process at M/s Dalmia cements
3. Bio-Reactor Commissioned Feb -2017
4. RO plant 165 KLD (stand by) installed
5. 4.500 tree saplings planted.

3. Malladi Drugs and Pharmaceuticals limited – Unit – 3:

1. M/S Malladi Drugs and Pharmaceuticals Ltd., Unit – 3 has installed forced circulation evaporator and crystallizer to recover salt to eliminate the discharge of MEE concentrate to Solar Evaporation Pan and to ensure Zero Liquid Discharge.

4. SVISS LAB Pvt. Limited:

1. Three stage wet scrubber installed along with Graphite Heat Exchangers for HCl Scrubbing. For efficient scrubbing and to minimize HCl vapour pollution, chilled water is circulated in Heat Exchangers.
2. Quencher vents are connected to a chilled Heat exchanger
3. Duct facility is provided for Acetyl Chloride handling and connected to Scrubber.
4. Installed SPM Opacity Monitor in the year 2016

5. Ultramarine & Pigments Limited:

1. Ultramarine & Pigments Ltd., has provided two more additional cyclones in the Pigment plant scrubber inlet line to decrease the particulate emissions.
2. Commissioned “Multiple Effect Evaporator” with “Vertical Thin Film Dryer” for treating effluent water by replacing the mechanical evaporators.
3. Commissioned “RO Plant – 3rd Stage” in addition to existing 2 stage RO to increase the permeate level for reusing in the process.
4. Installed 6 no of “Solar Thermal Concentrators” to use renewable energy for pigment drying and reduced fuel consumption on pigment drying.
5. Introduced solar tunnels for pigment drying using solar energy.
6. Replaced the turbine flow meters with “Electro Magnetic Flow Meters”’ in RO feed, permeate & MEE plants for better accuracy in readings.
7. Three nos of solar ponds are removed from usage to eliminate the effluent leaks from solar ponds.
8. Installed 117 KW solar power panels to reduce the power intake & to reduce the DG operation.

6. CETP’s

1. M/S Ranipet SIDCO Finished Leather Effluent Treatment Company has installed RO plants with Multiple Effect Evaporator to ensure Zero Liquid Discharge.
2. M/S SIPCOT – SIDCO Phase – 2 Entrepreneurs Finished Leather Effluent Treatment CO Ltd., has installed RO plants with Multiple Effect Evaporator to ensure Zero Liquid Discharge.

Period - 2017-18

1. **Thirumalai Chemicals Limited:**

1. Installation of ATFD for effective recovery of Salts.

2. **Malladi Drugs and Pharmaceuticals limited – Unit - 1:**

1. Condensate Treatment system (FICCO- Fluidized Immobilized Carbon cell oxidation process plant) installed.
2. Triple Effect Evaporation System (stand by) installed
3. 1000 Trees planted

3. Malladi Drugs and Pharmaceuticals limited – Unit - 3:

1. Aeration treatment system installed

4. SVISS LAB Pvt. Limited:

1. PTZ camera and MFM are provided and connected to TNPCB WQW/CPCB.
2. 205 No. of trees are planted and developed as a Green Belt.

5. Ultramarine & Pigments Limited:

1. Fuel for Thermic Fluid Heaters is changed from Kerosene to LPG to reduce emissions in pigment drying.
2. Introduced mobile dust collectors in the pigment drying area.
3. 2 Nos. of solar ponds are removed from operation as there is no need of the same.
4. Started using calcined china clay instead of raw china clay to reduce the emissions from the calcination chimney.
5. Started trials to convert the existing solid fuel fired kiln into LPG fired kilns by converting one kiln for trial.
6. Installed additional 75 KW solar power panels

Period - 2018-19

1. Malladi Drugs and Pharmaceuticals limited – Unit - 3:

1. Agitated thin film dryer installed 2 Nos.

2. SVISS LAB Pvt. Limited:

1. One more Graphite Heat Exchanger added for better recovery of HCl Totaling to 3 Nos. of Heat Exchangers having 12 Sq.m Surface Area.
2. While handling the Aluminium chloride and empty aluminium chloride bags, Blower and Scrubber facility are provided to remove vapours and reduce fugitive emissions at the shop floor.
3. To control Flue gas and wastage of Fuel, for every 15 days Boilers tubes are cleaned instead of monthly once cleaning.
4. Another 25% Green Belt Area Developed.

3. Ultramarine & Pigments Limited:

1. Removed Calcination process from operation to eliminate the emissions from calcination chimney in pigment operation.
2. Converted 3 solid fuel-fired kiln into LPG fired kiln to reduce emission from the pigment operation.
3. Installed dust collector in spray tower in addition to the existing two cyclones to eliminate the dust emissions.
4. Increased the product yield to reduce the specific consumption of fuels in pigment and sulphonation process.
5. Revamped the bag filter system in pigment drying area to eliminate the dust emission from attritor operation.
6. Effluent storage tanks are revamped to ensure that no leaks in the civil tanks.
7. Paved block roads laid in MEE and A shed area to reduce the dust emissions due to vehicle movements.
8. Modified the cyclone separators prior to the scrubber to 100% removal dust to ensure better scrubbing efficiency in scrubber

6.2 Other Initiatives in CEPI Area:

1. The SIPCOT authorities have revamped the damaged roads, drainages and improved the lightings at a cost of 20 Cr.
2. The SIPCOT authorities and SIPCOT Industries Association of Ranipet (SIAR) has developed a green belt in and around the SIPCOT area.

7.0 PROPOSED ACTION PLAN

7.1. Proposed Short Term Action plan:

Proposed action Plan For Further Reduction Of CEPI Score :

SHORT TERM MEASURES - (ONE YEAR)

1. Tamilnadu Pollution Control Board:

S.No	Description	Responsible stack holders	Time limit	Cost in Rs.
1	Establishment of CAAQM station at RANIPET – Monitoring Equipment installed	Tamilnadu Pollution Control Board	February 2020	-

Proposed short term action plans are elaborated industry wise:

i) M/s Thirumalai Chemicals Ltd.,

Sl No	Description	Action Plan	Target date	Cost in Rs.
1	Water Environment	Provision of proper rain water collection system in the unit premises to tap the rain water, treat and reuse for beneficial purpose to the extent possible.	March 2020	0.55 Cr.
2		Revamping of the storm water drain within the unit premises with respect to surface runoff	March 2020	0.45 Cr.
3		Ensuring 100 % segregation of different steams of effluent at source based on the characteristic of effluent generated and revamping of existing ETP with latest state of art of treatment technology	July 2020	9.0 Cr
4		Upgradation of the existing anaerobic contact filters so as to improve the quality of influent into aerobic treatment system.		

ii) Malladi Drugs and Pharmaceuticals Limited-Unit-I

S.No.	Description	Action Plan	Target Date	Cost in Rs.
1	Water Environment	Biological Treatment of Evaporator Condensate -- Provision of FICCO (Fluidized Immobilized Carbon Cell Oxidation plant) settling tank and micron filter at FICCO treated water outlet.	June -2020	5 Lakhs
2	Air Environment	1. Retro –fitted Emission Control Equipment for DG set.	May - 2020	2 Lakhs
		Control measure Provision of tertiary condenser with chilled water (5 to 7°) for the solvent handling unit.	April -2020	15 Lakhs
		3. Odour control measure for ETP will be provided with bionics odour control measures.	August-2020	10 Lakhs
3	Solid Waste	Clarifier sludge disposed to TSDF (Treatment Storage and Disposal Facility) Tamilnadu Waste Management.	June -2020	

iii) M/s Malladi Drugs and Pharmaceuticals Ltd – Unit-3

S.No	Description	Action Plan	Target Date	Cost in Rs.
1	Water Environment	Biological Treatment for FCE (Forced Circulation Evaporator) condensate and AFTD Condensate	July 2020	50 Lakhs
2	Air Environment	1. Retro -fitted Emission Control Equipment for DG set. 2. Stopping Furnace Oil boiler to reduce sulphur di oxide emission by utilizing bio fuel fired boiler VOC emission control measure provision of tertiary condenser with chilled water (5 to 7°) for the solvent handling unit.	May - 2020 May -2020 April-2020	3 Lakhs 500 Lakhs 15 Lakhs

iv) SVISS LABS Pvt. Ltd.,

S.No.	Description	Action Plan	Target date
1	Water Environment	i) High and low Concentrated effluents will be separated and low concentrated effluent treated with RO and permeate 55 will be used for process and RO Rejects will evaporated through Solar Evaporation pan.	July -2020
2		ii) Push cock taps will be provided in toilets to reduce water consumption and also sewage generation.	March -2020
1	Air Environment-	<u>Improvement in the Scrubbing System</u> i)2 Nos. of new Blowers will be provided ii)Dry Scrubber will be provided in between wetter type scrubber and Blowers	March -2020
2		<u>Solvent Recovery:</u> Common vent condenser will be provided with Brine circulation for better recovery and for reducing the emissions at solvent distillation stage.	March -2020
3	Air Environment	<u>Control of Solvent loss:</u> i) To minimize the solvent vapor loss and to reduce the emissions from solvent storage tanks will be painted enamel color which reduces the heat absorption from sunlight. ii) Dip pipes are provided for unloading the solvent in each Solvent storage tank to minimize the solvent loss and fugitive emissions.	March -2020

v) Ultramarine & Pigments Limited

S No.	Description	Action Plan	Target date
1	Water Environment	Solar pond used for storing Condensate water available near MEE will be closed.	March-2020
2		Monitoring Bore Wells arrangement will be provided around the plant to monitor the ground water quality	March-2020
3		Open Effluent Storage Tank available near MEE will be closed	March-2020
4	Air Environment	4 Nos. of "Solid Fuel Fired Kilns" will be converted to "LPG Fired Kilns" to reduce particulate emission	March-2020
5		"Dust Collection System" with higher efficiency will be installed in the following location in pigment plant. Pigment Drying – Rotary Dryer no 1-7.	March-2020
7		Existing "Dust Collection System" pigment blending area will be revamped to increase the efficiency. Pigment Blending – Nauta No. – 1- 7	April-2020
8		In Pigment Plant existing "Scrubber" will be replaced to increase the efficiency	March-2020
9		In Boiler the existing "Furnace Oil fired Burner"will be replaced with "LPG/LNG fired Burner"	March-2020
10		In Spray Tower Plant Hot Air Generator, the existing "Furnace oil fired Burner" will be replaced with "LPG/LNG fired Burner"	July-2020

11	Air Environment	“Dust Collection Bag Filter System” will be installed in addition to existing cyclone separator of Spray Tower Plant to increase the efficiency.	August-2020
12		In sulphonation plant existing “Scrubber” will be replaced with “New Scrubber” with fine spray system to increase the efficiency.	August-2020

vi) M/s. Ranipet SIDCO Finished Leather Effluent Treatment Company Ltd., Phase – I CETP

S.No	Description	Action Plan	Target Date	Cost in Rs.
1.	Water Environment	Modification in collection and conveyance	December-2020	65.56 Crores
2.		Upgradation of PST treatment		
3.		Upgradation of RO plant two stage		
4.		UF upgradation to PVDF		
5.		HPRO for concentration of reject		
6.		Upgradation of Colour removal system		
7.		Upgradation of MEE with salt recovery		
8.		Solar power unit, 3 MW		
9.		Sludge extraction pump with lorry and tractor		

vii) M/s. SIPCOT and SIDCO phase – II Entrepreneur Finished Leather Effluent Treatment Company Pvt. Ltd.,

S.No	Description	Action Plan	Target Date	Cost in s.
1.	Water Environment	Upgradation of collection and conveyance -Modification in raw effluent collection system to pumping line	December 2020	25.42 Crores
2.		<u>Upgradation of CETP –</u> Primary treatment- up gradation Mechanical screen dosing pumps and OHR. Modification-Secondary treatment, new Aerators and treated effluent storage. Modification -Tertiary treatment Oxidation system and dosing pumps Filter press (4 Ton/day) – 1 No.		
3.		Upgradation of Membrane System - Installation of two stage RO plant		
		400 m^3/d and HPRO 350 m^3/d		
4.		Up gradation of Reject Management MEE with all - accessories 220 m^3/day with ATFD, centrifuge Jetting Machine – 1200 bar, 75 HP for evaporator cleaning		
5.		Alternative power systems -Solar power (1MW)		
6.		Others Upgradation of laboratory and safety equipment Installation of new DG set (250 KVA)		

viii) M/s. ALCHYMARS ICM SM PRIVATE LIMITED [UNIT-II].

S.No	Description	Action Plan	Target Date	Cost in Rs.
1	Air Environment	Provisions of Programmed Logic control (PLC) system with interlocking facility to all the reactors to avoid any eventuality of accident in future	May 2020	5 Lakhs
2	Water environment	Revamping of Effluent Treatment Plant (ETP) with ZLD system.	May 2020	20 Lakhs

ix) M/s. SNAP Natural & Alginate Pvt. Ltd.,

S.No	Description	Action Plan	Target Date	Cost in Rs.
1.	Water Environment	Installation of RO system followed by Multiple Effect Evaporator with ATFD so as to achieve ZLD.	June 2020	75 Lakhs
2.	Land	Management and handling of the bio composting of sludge without spillages and installation of piezo metric wells in and around the bio compost yard.	May 2020	3 Lakhs

ix) M/s. PA Foot Ware – Unit -2

S.No	Description	Action Plan	Target Date	Cost in Rs.
1.	Water Environment	Installation of Multiple Effect Evaporator followed by ATFD.	June-2020	35 Lakhs

7.2 Proposed Long Term Action plan:

Long term action plan are elaborated in the table given below

Long Term Action Plan

S.No	Action Points (Including source and mitigation measures)	Responsible stack holders	Time limit
1.	<u>Containment of dumpsite M/s. TCCL, Ranipet</u> i) M/s. ERM India Pvt. Limited, gave a technical presentation on the proposed treatment scheme for treating the chromium sludge to prescribed standards and to discharge treated water after meeting the standards and also to dispose the sludge after treatment and stabilization in land of M/s. TCCL. In this regard, certain additional details and clarifications were called for from M/s. ERM India Pvt. Limited and awaited. ii) As part of monitoring, regular samples are being taken by TNPCB from the dumpsite.	M/s. TIDCO, SIPCOT	In this regard as per the Chief Secretary review meeting held On 14.10.2019 the following decisions were taken, M/s. ERM India Pvt. Ltd shall prepare the revised DPR inclusive of the following, (i) Cost for Phase-I & Phase II (ii)Cost for remediation of Contaminated buildings & machineries of M/s.TCCL. (iii)Operating Cost(OPEX), etc., iv) Project management charges, etc., and the revised DPR has to be addressed to MoEF, Delhi for Approval and 100% funding provisions for the execution of the project.

2.	Continuous up gradation of infrastructure facility of SIPCOT i) By revamping the damaged roads, drainage, underground sewer system, green belt development etc.,	SIPCOT Ranipet	1. The SIPCOT authorities have revamped damaged roads, drainages and improved the lightings at a cost of 20 Cr. 2.The SIPCOT authorities and SIPCOT Industries Association of Ranipet (SIAR) has developed green belt in and around the SIPCOT Area 3. Continual improvement of infrastructure and green belt development under progress.
3.	Rejuvenation of lakes located in and around SIPCOT complex 1. Puliyanthangal Lake 2. Puliyakkannu Lake 3. Karai Lake 4. Thandalam Lake 5. Vanapadi Lake	SIPCOT & SIDCO Industrial Association/ PWD/ Dept of Rural Development	March - 2021
4.	1.Melvisharam Municipality Installation of Sewage treatment plant.	Melvisharam Municipality	December -2022
	2. Arcot Municipality Installation of sewage treatment plant	Arcot Municipality	December -2022
	3.Ranipet Municipality Installation of sewage treatment plant.	Ranipet Municipality	December -2022

5.	Installation of Common Sewage Treatment Plant for industries located in SIPCOT/SIDCO, Ranipet	SIPCOT and SIDCO Authorities	December -2022
6.	Changeover of fuel from Furnace Oil to Natural gas in a phased manner at a cost of 7.5 Cr.	M/S Thirumalai Chemicals Ltd.,	December - 2022

8.0 CEPI SCORE FOR THE POST MONSOON 2019:

Below given Table shows aggregated CEPI of present report in comparison with the CEPI Score 2011 & 2013, 2018 and CPCB report (2009).

Period	CEPI Score
Present Report 2019 – Post Monsoon	**28.13**
CEPI Score 2018	**79.38**
CEPI Score 2013	**79.67**
CEPI Score 2011	**84.79**
CPCB Report 2009	**81.79**

The result shows that the CEPI score of the present report is 28.13

This is lower than the CEPI score of 2018 studies (79.38), 2013 (79.67), 2011 (84.79) and CPCB report 2009 (81.79).

However, it should also be noticed over here that TNPCB's efforts through the formulation of action plans and effective implementation of Zero Liquid Discharge (ZLD) System /Pollution Control Measures by the industries and development of greenbelt and other infrastructural facilities decreased the overall concentration of pollutants in all aspects, i.e. air, land and water in SIPCOT Industrial Complex, Ranipet area in past five years. This has also resulted in a decreased score of CEPI now.

Air Quality Analysis Report

Pollutant	Groups	A1	A2	
PM_{10}	B	0.5	Large	A(A1xA2)
$PM_{2.5}$	B	0.5		
Ni	C	3		
		4	**4**	**16**

Pollutants	Avg (1)	Std (2)	EF[(3)=1/2]	No of Samples Exceeding (4)	Total no. of Samples (5)	SNLF Value [(6) = 4/5x3]	SNLF Score (B)	
PM_{10}	70	100	0.7	0	3	0	L	0
$PM_{2.5}$	26.5	60	0.44	0	3	0	L	0
Ni	0.025	20	0.00125	0	3	0	L	0
B Score = (B1 + B2 + B3)							**B**	**0**

C	**0**	**< 5 %**
D	**0**	**A-A-A**

AIR EPI	**(A + B + C + D)**	**16**

Water Quality Analysis Report

Pollutant	Groups	A1	A2	
BOD	B	0.5	Large	A(A1xA2)
NH4-N	A	1		
T Cr	C	1		
		2.5	**4**	**10**

Pollutants	Avg (1)	Std (2)	EF[(3)=1/2]	No of Samples Exceeding (4)	Total no. of Samples (5)	SNLF Value [(6) = 4/5x3]	SNLF Score (B)	
BOD	8.33	8.00	1.04	1	3	0.345	M	4.25
NH4-N	0.5	1	0.5	0	3	0	L	0
T Cr	0.17	0.1	1.7	3	8	0.64	H	5.75
B Value = (B1 + B2 + B3)							**B**	**10**

C	**0**	**< 5%**
D	**0**	**A-A-A**

Water EPI	**(A + B + C + D)**	**20**

Ground Water Quality Analysis Report

Pollutant	Groups	A1	A2	
TP	B	2	Large	A (A1xA2)
Fe	A	0.25		
T Hard.	A	0.25		
		2.5	**4**	**10**

Pollutants	Avg (1)	Std (2)	EF [(3)=1/2]	No of Samples Exceeding (4)	Total no. of Samples (5)	SNLF Value [(6) = 4/5x3]	SNLF Score (B)	
TP	0.27	0.30	0.90	1	4	0.225	M	11.25
Fe	0.19	0.30	0.633	1	4	0.158	M	3.5
T Hard.	492	600.0	0.82	0	4	0.00	L	1
B Value = (B1 + B2 + B3)							**B**	**15.75**

C	**0**	**< 5 %**
D	**0**	**A-A-A**

GW EPI	**(A + B + C + D)**	**25.75**

AIR	**:**	**16.00**
WATER	**:**	**20.00**
GROUND WATER	**:**	**25.75**
CEPI SCORE	**:**	**28.13**

9.0 CONCLUSION

During CPCB CEPI 2018 AAQ monitoring got reported Nickel presence (max 34.8ng/m^3) in the AAQ and showed all places are exceedances. It has been thoroughly checked the sources of Nickel contribution to ambient air and found only the probable source is auto spray dust from dry tannery units. It has been collected the autos spray dust in different dry tanneries and analysed through ICP MS, the maximum nickel detected in the auto spray wet scrubber dust is 0.950 mg/kg. The auto spray operations are the wet process and the same is connected as well to wet scrubber so that the maximum particulate matter in the auto spray stack is 20mg/m^3 and the operation is only 6 to 8 hours in a day. The expected concentration in the Nickel in AAQ is calculated as per the PM concentration in stack as well as the Nickel concentration in the wet scrubber sludge as follows;

For 10 HP Blower @ 2440 RPM

Particulate Matter in the Auto spray stack is 20 mg/m^3

The flow rate of the Auto spray stack is 7500 m^3/Hr

Particulate Matter Pollution Load = 20 mg/m^3 X 7500 m^3/Hr

= 1,50,000 mg/Hr = 0.15 Kg/Hr

PM Load per day is 3.6 kg/day

Nickel Presence in the wet scrubber sludge is 0.950 mg/kg

Based on PM load

Nickel is 0.950 mg/Kg

PM is 3.6 Kg/Day

Nickel in PM load = 3.6 Kg of PM,

Nickel presence is (3.6 Kg x 0.950 mg/Kg= 3.42 mg)

Nickel load to AAQ = 3.42 mg/ day

Nickel presence based on the particulate matter load is 3.42 mg per day is emitting into the atmosphere.

Ambient Air Quality Monitoring will be sampled at the flow rate of 1.2m^3/min and total volume of the sample for 24 hours is 1728m^3.

Based on the above data

The expected ambient air quality Nickel concentration is 3.42mg/1728m^3 = 1.98µg/m^3.

It clearly indicates the Nickel presence in the ambient air is minimum based on the source of generation and emission. Also, the ambient air monitoring locations are fixed around 1 – 2 km away from these sources and proportionally dilution will take place due to dispersion. Based on that during 2019 CEPI Air quality monitoring, three additional Ambient Air Quality stations were identified in the CEPI impact area, in addition to the existing four sampling stations located in the core area. The 2019 AAQM survey results shows Nickel in all the locations are BDL. Also all the auto spray operations itself is wet process and followed by wet scrubber can completely remove the dust generation on this operation and PM concentration in the stack is almost nil.

All the 17 category units, Common Effluent Treatment Plants (CETPs), Red and Orange Large/medium units have installed Zero Liquid Discharge System to achieve Zero Discharge Liquid and there is no discharge of effluent either directly or indirectly into the nearby water bodies.

The industries who don't have sewage treatment plants have made provision for disposing the domestic sewage into septic tank and soak pits.

The presence of Total Coliform, Fecal Coliforms and Anionic Surfactants in the surface water reveals that the intrusion of untreated sewage from nearby Towns/Municipalities causes BOD Load in the river / lake and the concentration of Total Ammonical Nitrogen due to further putrefaction of organic matters (BOD Load).

The intrusion of untreated sewage discharged into the water bodies from the nearby habitations/Towns such as Melvisharam, Arcot, Ranipet Municipalities may cause the BOD load/ the presence of Total Ammonical Nitrogen in the River, since there is no underground sewerage system and common sewage treatment facility is provided in all the three municipalities, and the entire untreated sewage is discharged into River Palar.

Further, it is to mention that, there are local bodies abetting the industrial area. The domestic sewage generated from these local bodies also enters the industrial area through storm water drains passing through the industrial area and joins nearby lakes.

The ground water CEPI score found to be normal. Further the Hazardous wastes, Bio medical wastes are properly collected, stored and disposed in scientific manner and hence

there is no discharge / seepage from hazardous waste storage facility in to storm water drain /water bodies and on land.

The health data collected from the five hospitals, reveals that there is a decreasing trend of less than 5% in Air and water borne disease cases considered in the consecutive years of (2016 – 17 and 2017- 18). Hence the score for receptor (C) is considered as zero for Air, Water and Land Environment.

All, Small, Medium Large scale industries and Common Facilities in the CEPI area have adequately designed/operated and maintained pollution control facilities.

The present study shows the characteristics and status of environmental pollution caused by different industrial clusters of SIPCOT Industrial Complex, Ranipet.

It shows that the concentration of pollutants in the air, ground water and surface water is lowered down as compared to past studies, as most of the results are observed below their standards with the exception of one or two parameters.

Parameters of air sampling are observed reveals that all the pollutant parameters are within the standards prescribed by CPCB.

All the surface water samples are found within the limits except BOD, Total chromium.

All the ground water samples are found within the limits except Total Phosphorus & Iron.

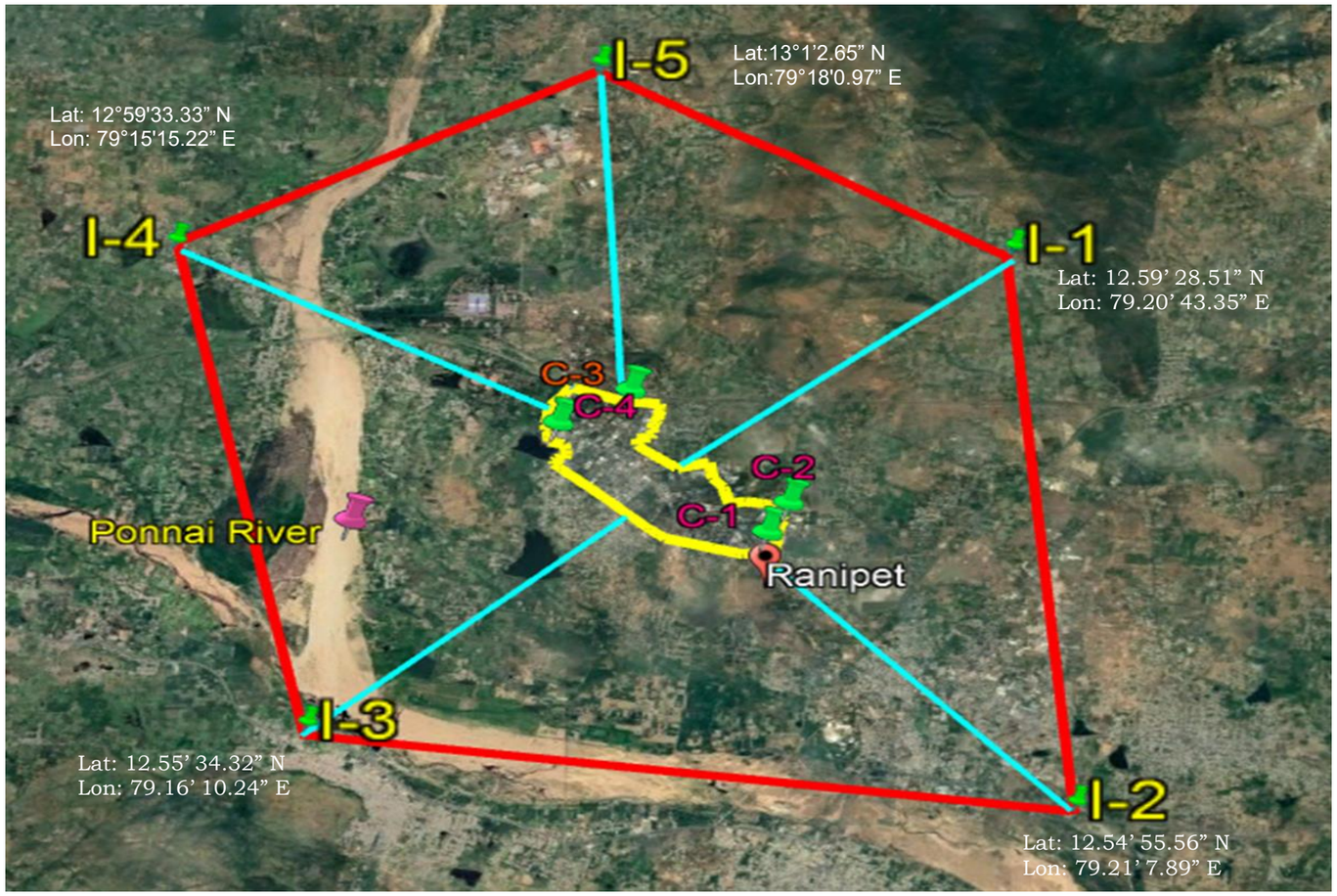
Moreover, the lower value (28.13) of Comprehensive Environmental Pollution Index (CEPI) in the present study as compared to past few years' study also reveals the fact that the environmental pollution in this industrial cluster is substantially decreased over the period of times.

To achieve this target, improvement in conventional practice and procedures adopted by the industries coupled with initiatives taken by Tamilnadu Pollution Control Board played a major role. Although, a decrease in environmental pollution is observed, still there is lot of scope to improve the environmental quality of this industrial cluster, for which continuous efforts, strategies, planning and actions are required.

ANNEXURE

A1. CEPI Boundary Map showing Core zone, Impact zone & Buffer zone

MAP SHOWING SAMPLE LOCATIONS AND BOUNDARIES OF CORE & IMPACT ZONE OF CEPI AREA – RANIPET:



Boundaries of Core & Impact Zones with offset line with buffer distance of 5 KM

Boundaries of Core Zone in the Critically Polluted Area

Boundaries of Impact Zone in the Critically Polluted Area

Offset line (5km)

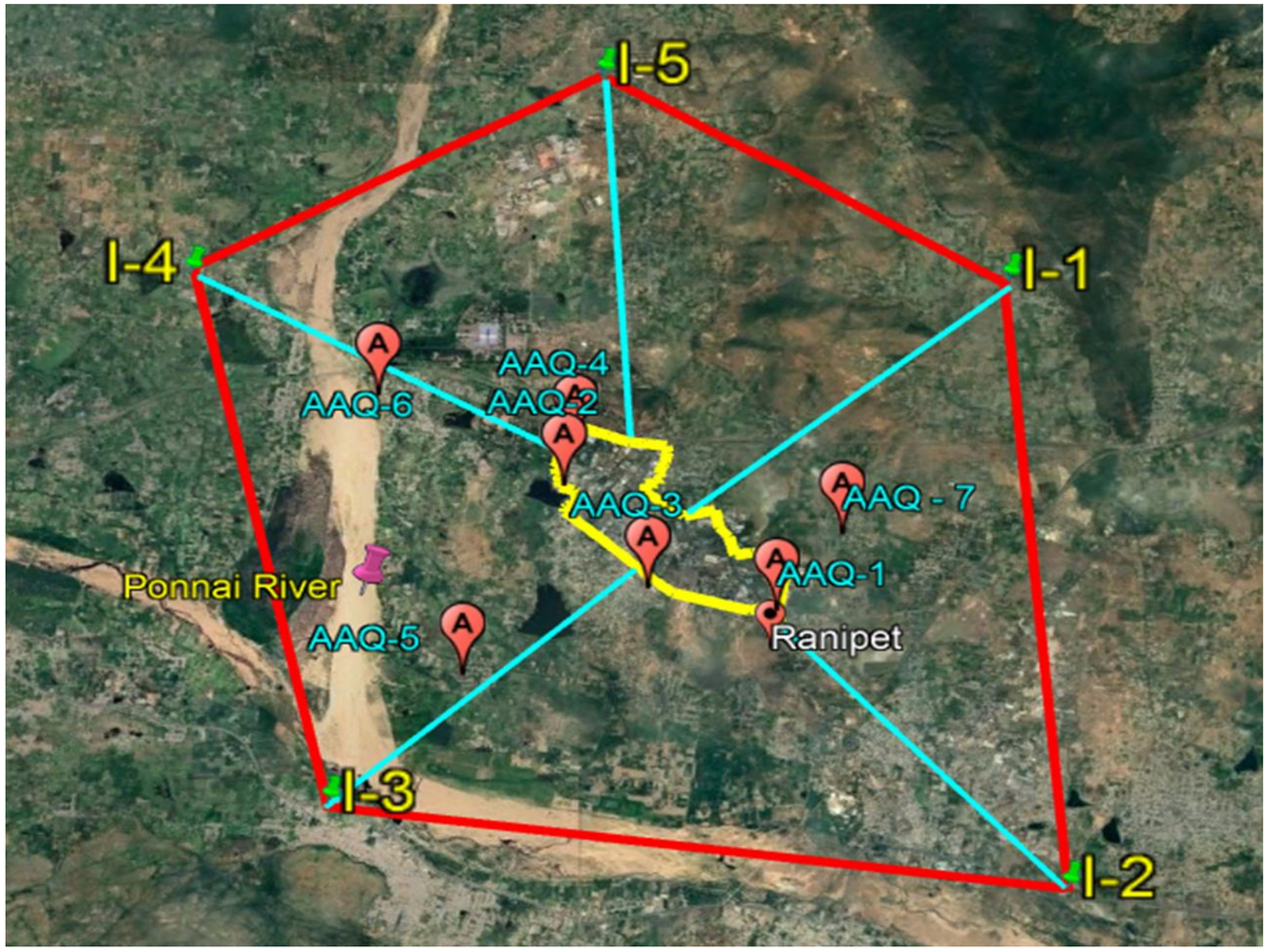
Boundaries of (Core zone) Critically Polluted Area (CPA) are marked as

S.No.	Location	Coordinates
C-1	South – East (Malladi Drugs and Pharmaceuticals Ltd.,- Unit I)	Lat: 12.950881 Lon: 79.318435
C-2	North – East (Malladi Drugs and Pharmaceuticals Ltd.,- Unit II)	Lat: 12.953628 Lon: 79.320325
C-3	North – West (Kamar Chemicals Ltd.,)	Lat: 12.970441 Lon: 79.303540
C-4	South – West (SVISS Lab. Ltd.,)	Lat: 12.965910 Lon: 79.295675

Boundaries of Impact Zone in the Critically Polluted Area (CPA) after incorporated the additional surface water samples location & Air Samples location are marked as

S.No.	Location	Coordinates
I-1	North East – Kalpudhur, Walajapet Taluk	Lat: 12.59' 28.51" N Lon: 79.20' 43.35" E
I-2	East – Vannivedu, Walajapet Taluk	Lat:12°54'55.56"N Lon:79°21'7.89"E
I-3	South – Palar River (GIT College Front side)	Lat:12°55'34.32"N Lon:79°16'10.24"E
I-4	West – Govt. Higher Secondary School, Thiruvalam	Lat: 12°59'33.33"N Lon: 79°15'15.22"E
I-5	North – Poonai Main Road, Nellikuppam	Lat:13°1'2.65"N Lon:79°18'0.97"E

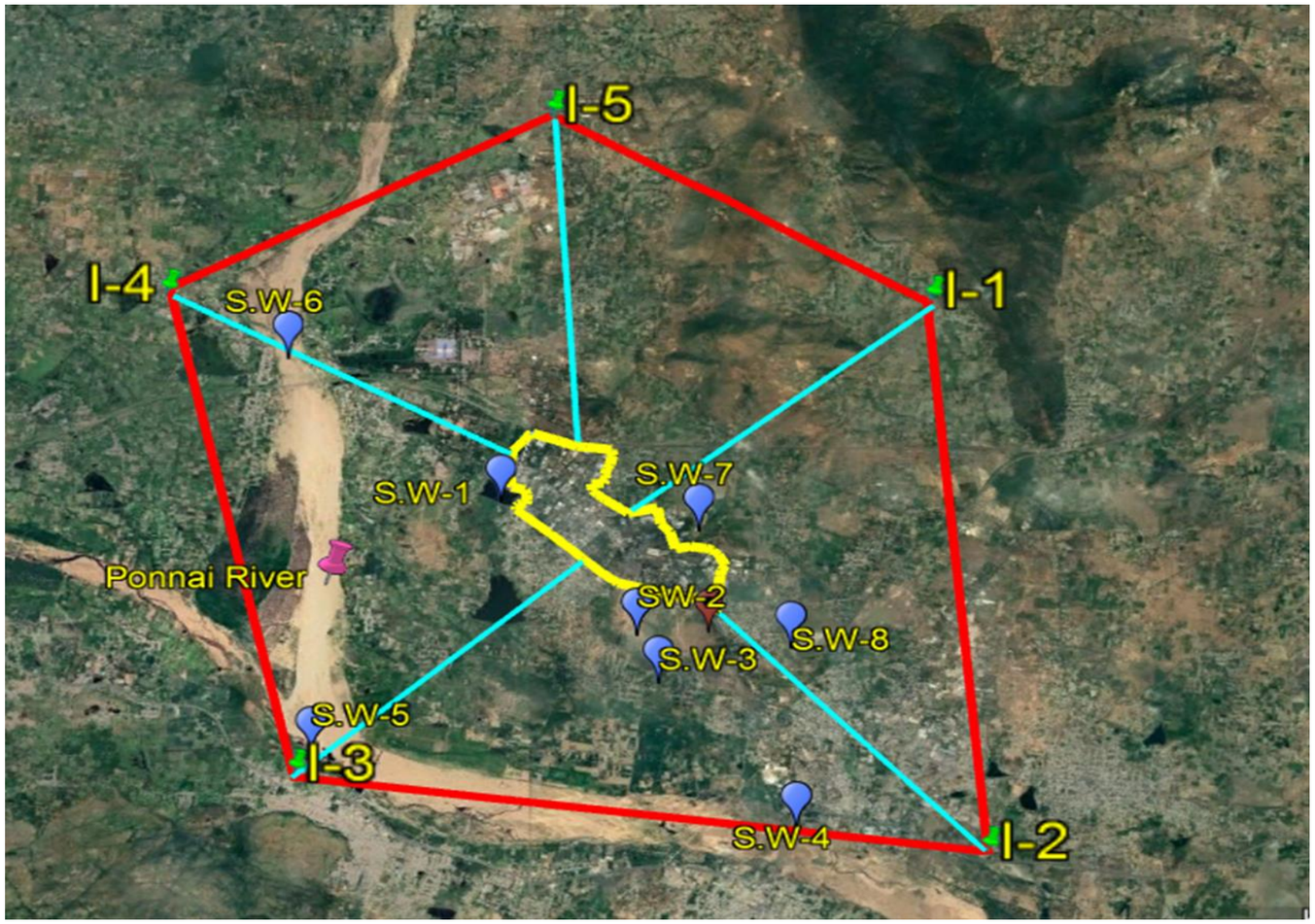
A2. Boundary Map showing sampling locations of Air in CEPI Area



S.No	Name of Location	Latitude	Longitude
AAQ-1	Malladi Drugs & Pharmaceuticals Ltd.,	12°57'01.8"N	79°19'11.0"E
AAQ-2	SIVSS Labs Ltd.,	12°57'58.2"N	79°17'45.5"E
AAQ-3	CSI Higher Secondary School	12°57'11.9"N	79°18'19.2"E
AAQ-4	Greaves Cotton Ltd.,	12°58'15.7"N	79°17'50.1"E
AAQ-5	Avarakkari (Kothandaraman Temple) **(Additional Point)**	12°56'32.6"N	79°17' 4.7"E
AAQ-6	Sikkarajapuram–TNHB, Plot No.268 **(Additional Point)**	12°58'38.99"N	79°16'30.91"E
AAQ-7	Vanapadi - Big Street -Balaraman House **(Additional Point)**	12°57'36.7"N	79°19'37.38"E

Locations of Ambient Air Quality Survey

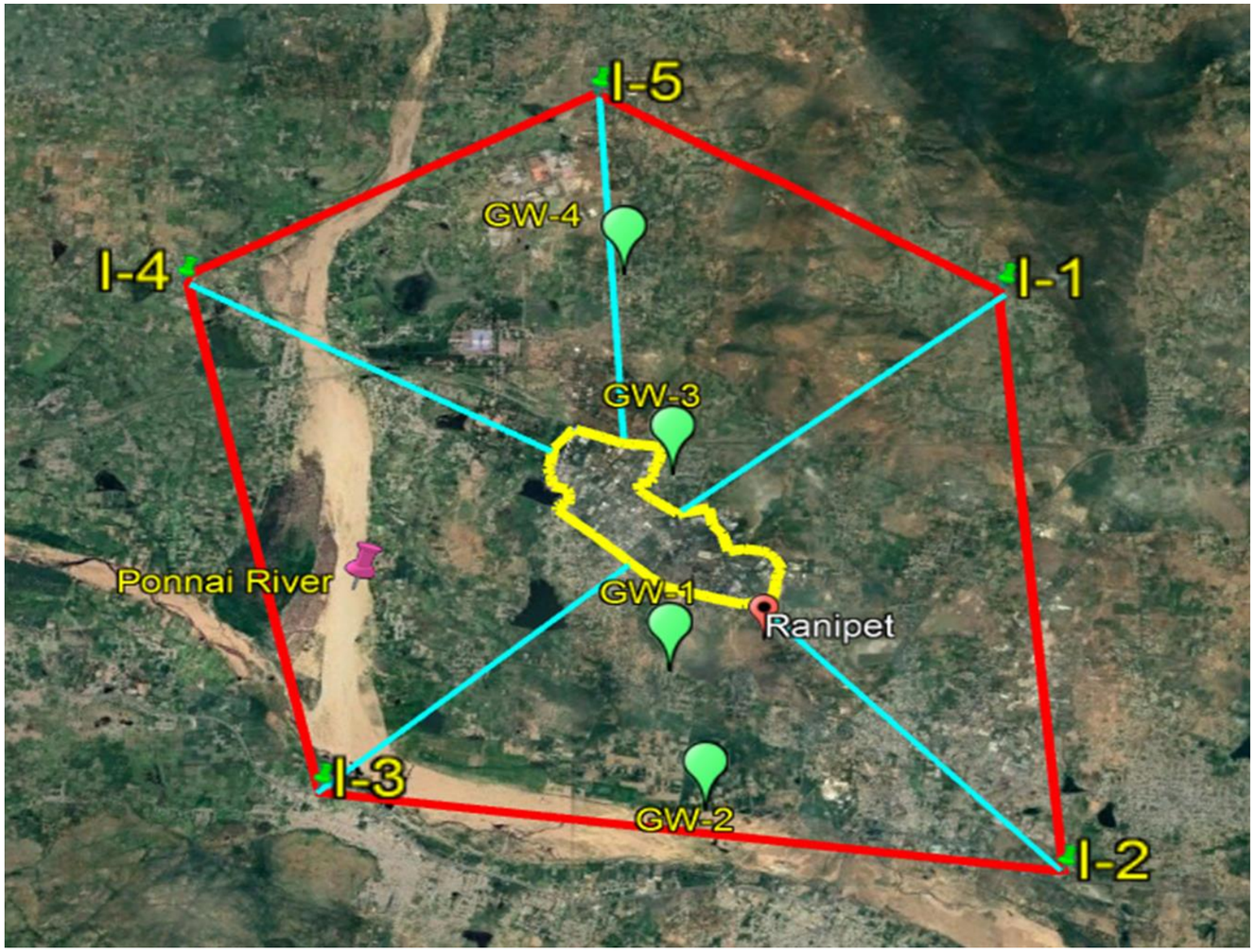
A2. Boundary Map showing sampling locations of Surface Water in CEPI Area



S.No	Name of Location	Latitude	Longitude
SW-1	Pullinathangal Eri	12°57'48.9"N	79°17'39.2"E
SW-2	Puliankannu Eri	12°56'43.3"N	79°18'37.6"E
SW-3	KaraiEri	12°56'19.5"N	79°18'46.8"E
SW-4	Palar River (Aroct Bridge)	12°55'07.0"N	79°19'46.0"E
SW-5	Palar River (GIT College Back side) **(Additional Point)**	12°55'44.3"N	79°16'17.9"E
SW-6	Ponnai River (Sikkarajapuram) **(Additional Point)**	12°59'1.4"N	79°16'7.7"E
SW-7	Vanapadi Lake **(Additional Point)**	12°57'35.3"N	79°19'4.2"E
SW-8	Thandalam Lake **(Additional Point)**	12°56'36.8"N	79°19'43.7"E

Locations of Surface Water Samples

A2. Boundary Map showing sampling locations of Ground Water in CEPI Area



S.No	Location Names	Latitude	Longitude
GW-1	Pulliankannu Village	12°56'30.2"N	79°18'30.7"E
GW-2	Ranipet Pump House	12°55'24.7"N	79°18'45.0"E
GW-3	Narasinghapuram	12°58'03.0"N	79°16'45.0"E
GW-4	Lalapet	12°59'37.2"N	79°18'12.3"E

Locations of Ground water samples

A3. Health data obtained from hospitals

A4. Photos of improvements carried out by Industries & other initiative works in CEPI Area

Pollution Abatement Systems Installed

1. M/s Thirumalai Chemical Ltd.,

Post Bed

Multiple Effect

2. M/s Ultramarine & Pigments Ltd.,

RO 3rd Stage

Sewage Treatment Plant – 60KLD

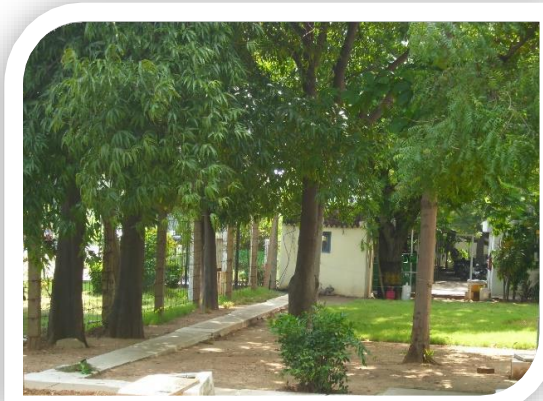
Multiple Effect Evaporator

MEE-Vertical Thin Film Dryer

Solar Thermal Concentrators

Thermic Fluid Heating System

Green Belt



Green Belt

3. M/s Malladi Pharmaceutical Ltd., Unit -3

Sewage Treatment Plant

Green Belt

Double Effect Evaporation Plant

Forced Circulation Evaporation

Forced Circulation Evaporation Plant

4. M/s Malladi Pharmaceutical Ltd., Unit -1

Sewage Treatment Plant

Multiple Effect Evaporator Systems

Bio Reactor

RO Plant

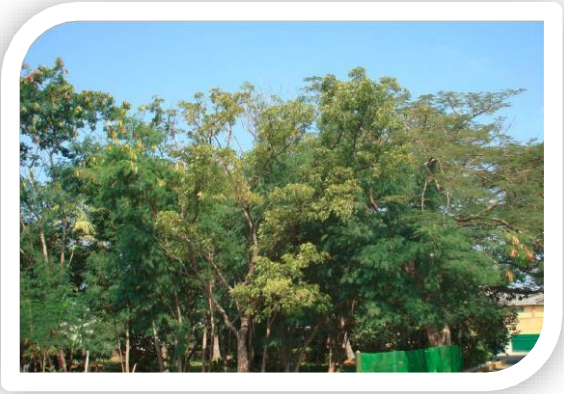
Triple Effect Evaporator 1

Triple Effect Evaporator -2

5. M/s SVIS Labs (P) Ltd.,

3 Stage HCL Scrubbing System

Chilled Condenser Trap System to Reduce Solvent Emission



Green Belt

6. M/S Greaves Cotton Ltd.,

VOC Sensor at Paint Shop

RO Plants

Reject Evaporation using Accelerated Solar Pan & Solar UV Tunnels

7. SIDCO CETP -2

UF – RO System

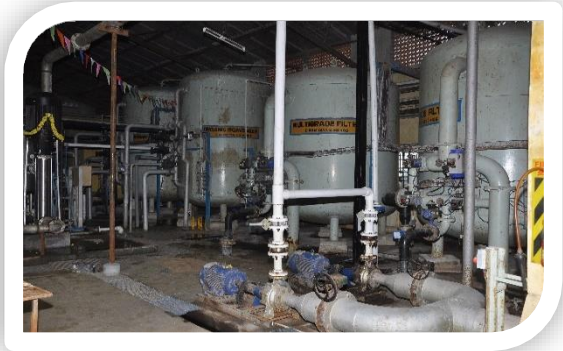
Organic Scavenger

RO Unit

Over Head Permeate

Multiple Effect

8. Ranipet SIDCO Finished Leather CETP



Multi Grade Filter System

RO Plants

Original Hydro Dynamic Reactor- In Aeration Tank

Multiple Effect Evaporator

9. Road Development by SIPCOT Authorities

IV Cross Road – Before

IV Cross Road – After

VI Cross Road – Before

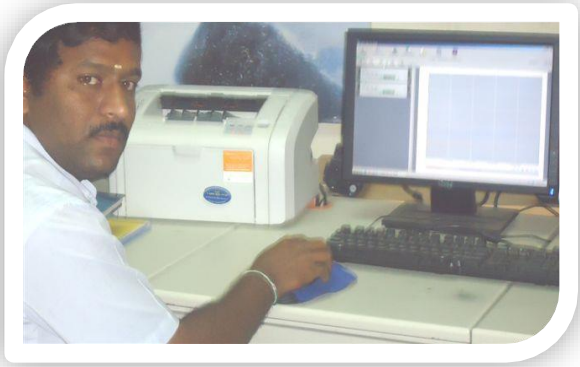
VI Cross Road – After

II Cross Road – Before

II Cross Road – Before

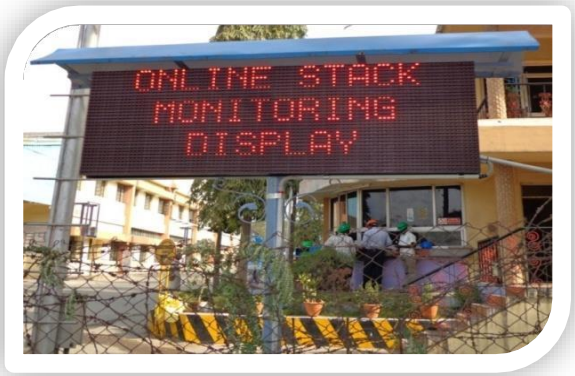
Monitoring Mechanism Provided:

1. M/s Thirumalai Chemicals Ltd.,



Online VOC Monitoring System

Flow Meters in RO plant



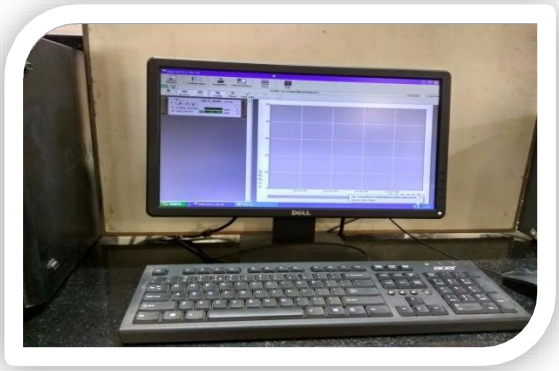
Real Time LED Display at Main Gate

IP Camera at ETP

CSEMS - Thermic Fluid Heater Stack & Scrubber

Online Water Quality Monitoring

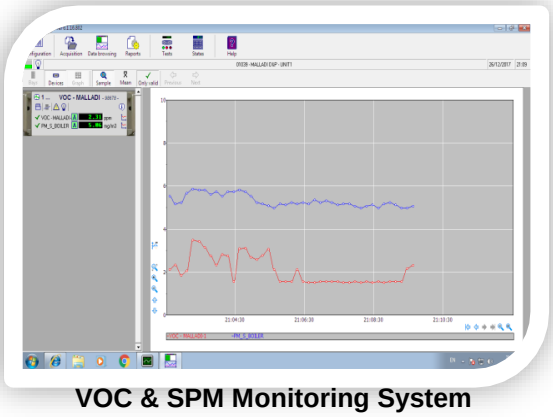
2. M/s Ultramarine & Pigments Ltd.,



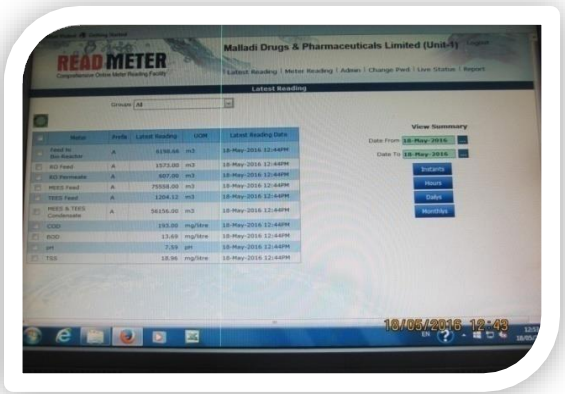
Online SO2 Monitoring

EMF Meter in RO Plant

3. M/s Malladi Pharmaceuticals Ltd., -Unit -1



VOC & SPM Monitoring System

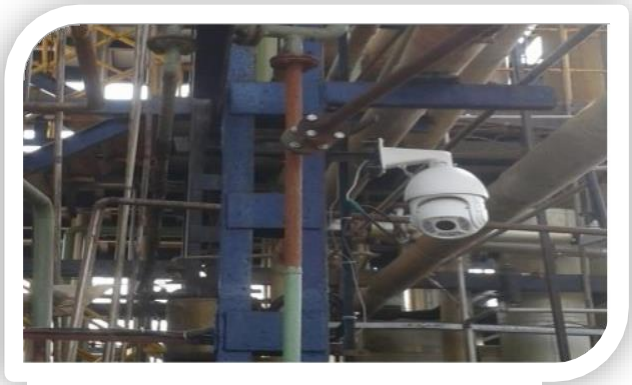


Water Quality Monitoring System

4. M/s Malladi Pharmaceuticals Ltd., -Unit - 3

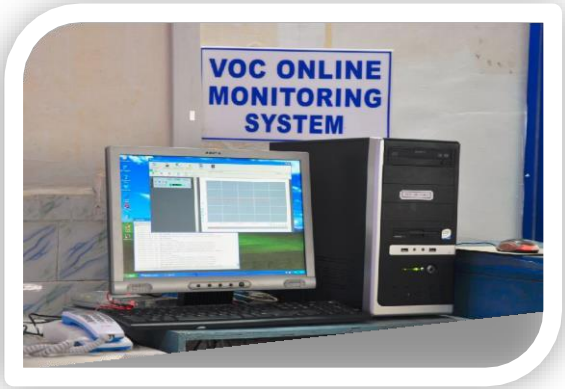
SPM Sensor

VOC



Online CCTV Web Camera

4. M/s Swiss Labs (P) Ltd.,



Online VOC Monitoring

SPM Opacity Monitoring

5. M/S SIDCO CETP -2

Water Quality Monitoring

A5. Analysis Report for the present CEPI score (Post Monsoon, November,2019)

CEPI Calculation of Vellore-North Arcot for Post Monsoon 2019

Comprehensive Environmental Pollution Index (CEPI) Working Sheet as per revised Formula given by CPCB Vide Lr No. B-29012/ESS (CPA)/2015-16/ Dated 26.4.2016

Hazard = Pollutant Source, Pathway and Receptor

1.Air Environment:

A: Source:

Factor A1- Presence of Toxins:

1. Criteria pollutants: (Ni)

Pollutant	Measured Mean Concentration	Score
Group-C - Nickel (Pollutant that are known carcinogens)	0.025 ng/m3	3
Score of Criteria Pollutant = Maximum Score of criteria pollutant (3)		**3**

2. Secondary Pollutants: (PM_{10}, $PM_{2.5}$)

Group-B–PM_{10}(Pollutant that are probable carcinogens)	70 µg/m3	0.5
Group-B–$PM_{2.5}$(Pollutant that are probable carcinogens)	26.5µg/m3	0.5
Score of secondary pollutant = Sum of all sec. pollutant score		**1**

A1 = Criteria pollutant score + Secondary pollutant score =		**4**

Factor A2- Scale of industrial activities:

Ranipet SIPCOT Industrial Complex:4 Nos. of 17 Category Large size units & 13 Nos. of Red Large Category units& 107 Nos. of Red Small Category units are Located		
A2 (As per guideline) =		**4**

Score A = A1 x A2 =		**16**

B: Pathway:

1. Primary Pollutants:

Level of Exposure is to be calculated using SNLF and the value given Table. SNLF refers to Surrogate number.

SNLF = (No. of samples exceed / total No. of samples) X (Exceedance factor) Exceedance Factor = Observed mean concentration of pollutant/Standard

1.1 Primary Pollutant*:* -Ni

Ni: Observed Mean concentration (ng/m^3) = 24 hrs Average	0.025	-
Ni: Standard (ng/m^3) Annual Average	20	-
Ni: Exceedance Factor = (Observed concentration of pollutant/Standard)	0.00125	-
No. of samples exceed the standard =	0	-
Total no. of samples =	3	-
SNLF (Ni) = (No. of samples exceed / total No. of samples) X (Exceedance factor)	**0**	**-**

EF < 0.75, SNLF = 0. Hence the Level of exposure Category of Ni: Low, Value (From Table) = 0		**0**

Contribution of Primary Pollutant = B1 = Maximum Score of criteria pollutant	**0**

2. Secondary Pollutants:

Secondary Pollutant: - PM10

PM10: Observed Mean concentration(µg/m3)	70	
PM10: Standard (µg/m3)=	100	-
PM10: Exceedance Factor= Observed mean concentration of pollutant/Standard	0.7	-
PM10: No. of samples exceed the standard =	0	-
Total no. of samples =	3	-
SNLF (PM10) = (No. of samples exceed / total No. of samples) X (Exceedance factor)	**0**	-
EF < 0.75, SNLF = 0. Hence the Level of exposure Category of PM10: Low, Value = 0		**0**

Secondary Pollutant: PM2.5

PM2.5: Observed mean concentration (µg/m3) =	26.5	-
PM2.5: Standard (µg/m3) =	60	-
PM2.5: Exceedance Factor =	0.44	-
Total no. of samples =	3	-
PM2.5: No.of samples exceed the standard =	0	-
SNLF (PM2.5) = (No.of samples exceed / total No.of samples) X (Exceedance factor)	**0**	-

EF < 0.75, SNLF = 0. Hence the Level of exposure Category of PM2.5: Low, Value =0		**0**

Contribution of Secondary Pollutant Sum of the score of secondary pollutants = B2	**0**

B = B1 + B2 =	**0**

C: Receptor:

It is relevant to Impact on Human Health - Based on the previous 5 years' records of 3-5 major hospitals of the area. For Air Environment, total no. of cases related to Asthma, Bronchitis, Cancer, Acute Respiratory infections etc are found to be < 5% increase in the cases considered	
Hence C value is taken as = 0	**0**

D: Additional High Risk Element:

All, Small, Medium Large scale industries and Common Facilities in the CEPI area have adequately designed/operated and maintained Pollution Control Facilities	
Hence D (From CPCB Guidelines) =	**0**

Sub-Index Score (Air) = (A+B+C+D) =	**16**

2. Water Environment:

Surface Water Source taken up for study: River Palar up Stream (Melvisharm), River Palar Downstream (Arcot), River Ponnai (Sikkarajapuram), Karai Lake, Puliankannu Lake, Puliyanthangal Lake, Vanapadi Lake, Thandalam Lake.

A: Source:

Factor A1- Presence of Toxins:

1. **Criteria pollutants*:* - (Total Ammonia (NH4+NH3)-Nitrogen)**

Pollutant	Measured Mean Concentration	Score
Group A - Total Ammonia (NH4+NH3) - Nitrogen (Pollutant not assessed as acute or systemic)	BDL	1
Score of Criteria Pollutant = Maximum Score of criteria pollutant (1)		**1**

2. **Secondary Pollutants*:* - (BOD, Total Chromium)**

Pollutant	Measured Mean Concentration	Score
Group-B - BOD (Pollutant not assessed as acute or systemic	8.33	0.5
Group C -Total chromium(Pollutant that are known carcinogens)	0.17 mg/l	1

Score of secondary pollutants = sum of score of sec. pollutants =		**1.5**

A1 = Criteria pollutant score + Secondary pollutants score =		**2.5**

Factor A2- Scale of industrial activities:

Ranipet SIPCOT Industrial Complex: 4Nos. of 17 Category Large size units & 13 Nos. of Red Large Category units& 107 Nos. of Red small Category units are located		
A2 (As per guideline) =		**4**

Score A = A1 x A2 =		**10**

B: Pathway

1. **Primary Pollutants:**

1.1 Primary Pollutant: -Total Ammonia (NH4+NH3)-Nitrogen

SNLF = (No. of samples exceed / total No. of samples) X (Exceedance factor)

Total Ammonia (NH4+NH3)-Nitrogen: Observed Mean Concentration (mg/L) =	BDL(0.5 mg/l)	-
Total Ammonia (NH4+NH3)-Nitrogen: Standard :Class- B Desirable CPCB 2002,Water Quality Criteria & Goals- MINARS Series; MINARS/17/2001-2002)	<1.mg/l	-
Total Ammonia (NH4+NH3)-Nitrogen: Exceedance Factor =	0.5	-
Total Ammonia (NH4+NH3)-Nitrogen: Total no. of samples =	3	-
Total Ammonia (NH4+NH3)-Nitrogen: No. of samples exceed the standard =	0	-
SNLF (Total Ammonia (NH4+NH3)-Nitrogen**) = (No. of samples exceed / total No. of samples) X (Exceedance factor)=**	**0.00**	-

EF < 0.75, SNLF = 0. Hence the Level of exposure Category of Total Ammonia (NH4+NH3)-Nitrogen: Low, Value = 0			**0**

Contribution of Primary Pollutant = B1 = Maximum Score of criteria pollutant (0)	**0**

2. Secondary Pollutant:

Secondary Pollutant: -Total Chromium

Total Chromium: Observed Mean Concentration (mg/L) =	0.17	-
Total Chromium (mg/L) : Standard :Class- C Acceptable CPCB 2002,Water Quality Criteria & Goals- MINARS Series; MINARS/17/2001-2002)	0.1	-
Total Chromium: Exceedance Factor =	1.7	-
Total Chromium: Total no. of samples =	8	-
Total Chromium: No. of samples exceed the standard =	3	-
SNLF (Total Chromium) = (No. of samples exceed / total No.of samples) X (Exceedance factor)=	**0.64**	-

EF 1.7, SNLF = 0.64. Hence the Level of exposure Category of Total Chromium : medium , Value = 5.75		**5.75**

Secondary Pollutant: - BOD

BOD: Observed mean concentration (mg/L) =	8.33	-
BOD (mg/L) : Standard :Class- C Acceptable CPCB 2002,Water Quality Criteria & Goals- MINARS Series; MINARS/17/2001-2002)	8	-
BOD: Exceedance Factor	1.04	-
Total no. of samples =	3	-
BOD: No. of samples exceed the standard =	1	-
SNLF (BOD**) = (No. of samples exceed / total No. of samples) X (Exceedance factor)**	**0.345**	-

EF 1.04, SNLF = 0.345. The Level of exposure Category of BOD: HIGH, Value = 4.25		**4.25**

Score of Secondary pollutants = sum of score of secondary. pollutants = B2	**10**

B = B1 + B2 =	**10**

C: Receptor:

It is relevant to Impact on Human Health - Based on the previous 5 years' records of 3-5 major hospitals of the area. For Water Environment, total no. of cases related to Gastroenteritis, Diarrhoea, renal (kidney) malfunctions, cancer are found to be < 5% increase in the cases considered	
Hence C value is taken as =0	**0**

D: Additional High Risk Element:

All, Small, Medium Large scale industries and Common Facilities in the CEPI area have adequately designed/operated and maintained Pollution Control Facilities	
Hence D (From CPCB Guidelines) =	**0**

Sub-Index Score (Water) = (A+B+C+D) =	**20**

3. Land Environment:

Ground Water Quality is considered to represent Land Environment

A: Source:

Factor A1- Presence of Toxins:

1. Criteria pollutants: - (Total Phosphorus)

Pollutant	Measured Mean Concentration	Score
Group B-Total Phosphorus(Pollutant not assessed as acute or systemic)	0.27mg/l	2
Score of Criteria Pollutant = Maximum Score of criteria pollutant (2)		**2**

2. Secondary Pollutants: - (Iron, Total Hardness)

Pollutant	Measured Mean Concentration	Score
Group-A - Iron(Pollutant that are probable carcinogens)	0.19	0.25
Group A – Total Hardness (Pollutant not assessed as acute or systemic)	492	0.25
Score of secondary pollutants = sum of score of sec. pollutants =		**0.5**

Score A1 = (sum of score of Primary pollutant and secondary pollutants)		**2.5**

Factor A2- Scale of industrial activities:

Ranipet SIPCOT Industrial Complex:4 Nos. of 17 Category Large size units & 13 Nos. of Red Large Category units& 107 Nos. of Red small Category units are located		
A2 (As per guideline) =		**4**

Score A = A1 x A2 =		**10**

B: Pathway

1. Primary Pollutants:

1.1 Primary Pollutant: -Total Phosphorus

SNLF = (No. of samples exceed / total No. of samples) X (Exceedance factor)

Total Phosphorus: Observed Mean Concentration =	0.27	-
Total Phosphorus: Standard :	0.3	-
Total Phosphorus: Exceedance Factor =	0.9	-
Total Phosphorus: Total no. of samples =	4	-
Total Phosphorus: No. of samples exceed the standard =	1	-
SNLF (Total Phosphorus**) = (No. of samples exceed / total No. of samples) X (Exceedance factor)=**	**0.225**	-

EF 0.9 SNLF = 0.225 Hence the Level of exposure Category of Total Phosphorus: Moderate, Value = 11.25		**11.25**

Max contribution of Primary Pollutant = B1	**11.25**

2. Secondary Pollutant:

Secondary Pollutant: - Iron

SNLF = (No. of samples exceed / total No. of samples) X (Exceedance factor)

Iron: Observed Mean Concentration =	0.19	-
Iron: Standard : Standard IS: 10500-1991 (mg/L) =	0.3	-
Iron: Exceedance Factor =	0.633	-
Iron: Total no. of samples =	4	-
Iron: No. of samples exceed the standard =	1	-
SNLF (Iron) = (No. of samples exceed / total No. of samples) X (Exceedance factor)=	**0.158**	-

SNLF =0.15 to <0.2 Hence the Level of exposure Category of Iron: Moderate, Value = 3.5		**3.5**

Secondary Pollutant: - Total Hardness

Total Hardness Observed Mean Concentration(mg/L)=	492	-
Total Hardness : Standard IS: 10500-1991 (mg/L) =	600	-
Total Hardness : Exceedance Factor =	0.82	-
Total Hardness: Total no. of samples =	4	-
Total Hardness: No. of samples exceed the standard =	0	-
SNLF (Total Hardness) = (No. of samples exceed / total No.of samples) X (Exceedance factor)= 0	**0**	-

SNLF = 0 (EF = 0.82) Hence the Level of exposure Category of Total Hardness: Low, Value = 1		**1**

Score of Secondary pollutants = sum of score of secondary. pollutants = B2	**15.75**

B = B1 + B2 =	**15.75**

C: Receptor:

It is relevant to Impact on Human Health - Based on the previous 5 years' records of 3-5 major hospitals of the area. For Land Environment, total no. of cases related to Gastroenteritis, Diarrhoea, renal (kidney) malfunctions, cancer are found to be < 5% increase in the cases considered

Hence C value is taken as =0	**0**

D: Additional High Risk Element:

All, Small, Medium Large scale industries and Common Facilities in the CEPI area have adequately designed/operated and maintained Pollution Control Facilities

Hence D (From CPCB Guidelines) =	**0**

Sub-Index Score (Land) = (A+B+C+D) =	**25.75**

Aggregated CEPI Score:

$$CEPI = i_m + [(100-im) *(i_2/100) *(i_3/100)]$$

Where,
im: maximum sub index; and i2 and i3 are sub-indexes for other media

Sub-Index of Air = 16, Sub-Index of Water = 20, Sub-Index of Land = 25.75

Hence im	=	25.75
CEPI	=	28.13
CEPI of Vellore- North Arcot (POST MONSOON)	**=**	**28.13**

001411

MINUTES OF THE COMMITTEE MEETING CONSTITUTED FOR CEPI ACTION PLAN OF RANIPET, VELLORE LOCATED IN TAMILNADU HELD ON 09.01.2020 IN THE CHAMBER OF PRINCIPAL SECRETARY ENVIRONMENT & FORESTS DEPARTMENT, SECRETARIAT, CHENNAI.

Present:

1. Thiru. Shambhu Kallolikar I.A.S.,
   Principal Secretary to Government,
   Environment & Forests Department, Secretaraiat, Chennai.

2. Thiru. A.V.Venkatachalam, I.F.S,
   Chairman,
   Tamil Nadu Pollution Control Board, Chennai.

3. Dr. S.Selvan
   Chief Environmental Engineer,
   Tamil Nadu Pollution Control Board, Chennai

4. Dr.A.Viswanathan, JD (Acts)
   O/o the Directorate of Medical & Rural Health Services

5. Tmt.H.Prabhavathy, GM (PI) i/c
   Representative of State Industries Promotion Corporation of Tamilnadu (SIPCOT)

6. Thiru.A.Sohail Ahmed,
   Technical Expert (GP), O/o Chief Engineer, PWD, W.R.O.,
   State Ground & Surface Water Resources Data Centre,
   Taramani, Chennai – 600 113.

7. Other TNPCB Officials.

The Chief Environmental Engineer, Tamil Nadu Pollution Control Board welcomed the committee members and officials of TNPCB and briefed about the new CEPI methodology adopted by CPCB.

Dr.S.Suresh Kumar from G lens Innovations Labs Pvt Ltd on behalf of AC Tech, Chennai (hired as third party by TNPCB for analysis and assessment of CEPI – post monsoon 2019) detailed the the concept of CEPI and briefed about the individual CEPI scores of CPCB in 2018 in Tamilnadu

and the present post monsoon scores in 2019 with regard to Air, Water and Land Environment in the 8 industrial clusters of Vellore, Manali, Coimbatore, Erode, Mettur, Tuticorin, Tiruppur, and Cuddalore.

With regard to Vellore CEPI area Dr.S.Suresh Kumar briefed the following

1. The CEPI scores for the last five periods are as follows

Period	**CEPI Score**
CEPI Score 2019	28.13
CEPI Score 2018	79.38
CEPI Score 2013	79.67
CEPI Score 2011	84.79
CPCB Report 2009	81.79

2. In the aggregated CEPI score of 2018, it has been reported that the Sub Index values for Air is 49, Water is 75 and Land is 33.75, thus the CEPI score was **79.38**, whereas in the present aggregated CEPI score during 2019 for the Sub Index values for Air is 16, Water is 20 and Land is 25.75, thus the CEPI score has reduced to **28.13.**
3. It has been distinguished for the high CEPI score in 2018 and for low CEPI score in 2019.

   The main reasons attributed for high CEPI score include,

   a. Presence of high Nickel content (max. 34.8ng/m^3) but possible source is auto spray dust, which also in wet form and emission is negligible.
   b. Sampling locations near to roadways contributing to higher particulate emissions.
   c. Score of 10 contributed from Health data increasing the sub index CEPI score in ground water to 35.75. d. The three village

ponds showed higher values for BOD, NH4-N caused due to localized activities and not due to industrial scores.

The main reasons for less CEPI score in 2019 include,

i. Additional AAQ stations to cover entire core industrial area.
ii. Present sampling not detecting nickel in the auto spray dust.
iii. No disposal of treated trade effluent and treated sewage into the nearby water bodies from the industries.
iv. All the 17 category units, CETPs and Red Large units have installed ZLD System to achieve Zero Discharge Liquid.

4. To the queries raised by the Principal Secretary, it was clarified that the critical parameters and locations identified by CPCB during 2018 was also followed while sampling during 2019. Representative of Chief Engineer, PWD, W.R.O. wanted to know whether other parameters could be included for CEPI assessment, for which it was replied that the protocol followed by CPCB had to be adopted for harmonious CEPI calculation every year. To the representative of Director of Medical & Rural Health Services, it was clarified that as per the direction issued by CPCB on 26.04.2016, the air and water borne diseases to be considered in the health data are Asthma, Bronchitis, Cancer, Acute respiratory infections, Gastroenteritis, Diarrhea, renal (kidney) malfunction cancer etc

5. After detailed discussion the committee members decided to approve the CEPI action Plan prepared for Ranipet, Vellore in Tamil Nadu and to submit to CPCB, New Delhi

With the above, the meeting came to an end.

S.No.	Members	Signature
1.	Thiru. Shambhu Kallolikar IAS., (Chairman of Committee) Principal Secretary to Government, Environment & Forests Department	
2.	Member Secretary, Tamilnadu Pollution Control Board, Chennai	Dr. S. Selvan CEE For Member Secretary
3.	Director of Medical & Rural Health Services	Dr A. VISWANATHAN. MS JD (AE&S)
4.	Representative of State Industries Promotion Corporation of Tamilnadu (SIPCOT)	H. Prabhavathy (H. PRABHAVATHY) G.M (PI) i/c / SIPCOT
5.	Chief Engineer, PWD, W.R.O., State Ground & Surface Water Resources Data Centre, Taramani, Chennai – 600 113	CA. SUHAIL AHMED, Technical Expert (Geophysics) O/o the Chief Engineer, PWD SG&SWRDC, Chennai-600113