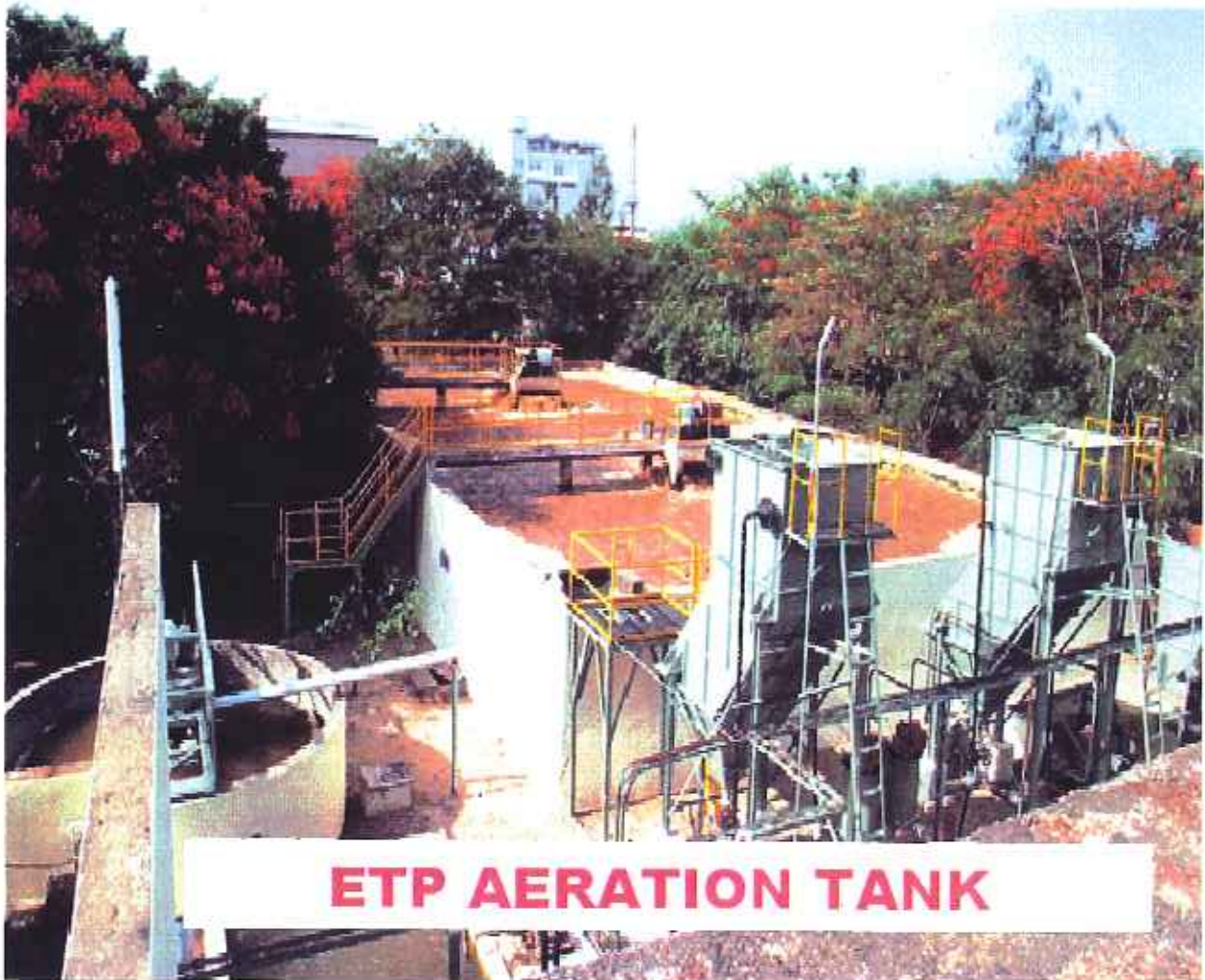




TAMILNADU POLLUTION CONTROL BOARD



REVISED ACTION PLAN FOR CRITICALLY POLLUTED AREA

CUDDALORE
NOVEMBER-2010

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**ACTION PLAN FOR ABATEMENT OF POLLUTION IN CRITICALLY
POLLUTED INDUSTRIAL CLUSTERS**
SIPCOT INDUSTRIAL COMPLEX [Phase-I & Phase-II] - CUDDALORE
(TAMILNADU), CEPI SCORE-77.45

1. INTRODUCTION

1.1 Area Details:

The SIPCOT Industrial Complex, Cuddalore was established during the year 1984. The Industrial complex, has phase-I and phase-II where textile processing, Pharmaceuticals, Dye, Chemicals, Pesticides and miscellaneous industries are located. The SIPCOT Industrial Complex, Cuddalore is located along the Cuddalore – Chidambaram High ways (NH 45-A). SIPCOT Phase-I has a total extent of 518.79 acres and SIPCOT Phase-II has a total extent of 190.52 acres. The SIPCOT, Cuddalore has the following infrastructure such as i) Water supply (Total number of bore-wells – 10, having a total yield of 3.1 MGD.) ii) Roads & drains – 18 m width road and 12 m width road of total length of 7 k.m. Apart from that a Post Office, Fire Station, CSIA Dispensary & Canteen are being operated in this area.

The SIPCOT Industrial Complex is surrounded by the following topography.

- North - Pachayankuppam Village.
- East - River Uppanar
- South - Sonanchavadi Village.
- West - NH-45-A connecting Cuddalore-Chidambaram

Details of industries in SIPCOT, Cuddalore

STATUS	PHASE-I	PHASE-II	TOTAL
Under operation	26	5	31
Temporarily stopped	3	Nil	3
Proposed	1	2	3
Remain closed	23	Nil	23
Total	53	7	60

In this industrial complex, 20 industries are generating trade effluent. All the industries have individual effluent treatment plant, in that 10 units have provided additional system to maintain zero discharge of trade effluent. Out of the remaining, 9 industries discharges their treated trade effluent into CUSECS (Cuddalore SIPCOT Industries Common Utilities Limited) for marine disposal into sea, and another one unit M/s. Clariant Chemicals India Ltd., discharges the treated trade effluent directly into marine through a separate pipe line , 1km into Bay of Bengal.

1.2 Location:

The district of Cuddalore lies on the East Coast and lies between 78° 42' and 80° 12' east latitude and 12° 27' 30" and 11° 10' 45" north longitude. It is bounded on the north by Villupuram district, on the south by Nagapattinam district, on the west by Perambalur and Villupuram districts and on the east by Bay of Bengal. The SIPCOT industrial complex Cuddalore (Phase-I &II) is located along the Cuddalore – Chidambaram High ways (NH 45-A) in Kudikadu village & Semmankuppam village of Cuddalore Taluk, Cuddalore District.

1.3 Digitized map with Demarcation of Geographical Boundaries and Impact Zones:

A 1:10000 scale map showing SIPCOT Phase-I &II, Cuddalore and a 2 km impact zone is enclosed

1.4 CEPI Score (Air , Water , Land and Total)

No	Industrial Area/clusters	Air	Water	Land	CEPI	
16	SIPCOT Phase I & II Cuddalore (Tamilnadu)	54.00	65.25	64.00	77.45	As_Wc_Lc

1.5 Total Population and Sensitive Receptors:

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	Cuddalore(O.T)	North	0.85	6401
2	Pachayankuppam	North	adjacent	6174
3	Kudikadu & Colony	East	adjacent	1889
4	Echangadu	East	adjacent	543
5	Sangolikuppam	East	adjacent	1599
6	Naduthittu	East	0.35	600
7	Nochikadu	East	0.35	2250
8	Rassapettai	East	0.85	1324
9	Thyagavalli	South-East	1.0	2100
10	Sonanchavadi	South	adjacent	361
11	Poondiankuppam	South-west	0.44	818
12	Semmankuppam	West	adjacent	1644
13	Periakaraikadu	West	0.5	941
14	Karaikadu	West	0.45	2149
15	Pillayarmedu	West	0.4	965
16	Kannarapettai	West	1.1	1104

No major hospitals, educational institution, courts etc is located within the impact zone of 2 Km.

A primary health centre with 30 bedded facility has been constructed at Kannarapettai village and to be commissioned.

*	Municipal clinic (out patients)	-	1
*	Private Hospital (each 10 beds)	-	2
*	Over Head Tank (water source from capper quarry at a distance of 10 k.m.).	-	3

- * Municipal Road - 4.82 k.m.
- * National Highways - 2 k.m.
- * Storm water (Open) drain - 11.86 k.m.
(Finally confluences with River Uppanar).

The following schools are located within 2 km of the impact zone.

Sl. No	Name of the School located at villages	Class	Total Numbers	
			Students	Teachers
Primary School				
1	Kannarappetai	I to V	117	5
2	Karaikkadu	I to V	117	4
3	Sonanchavadi	I to V	70	2
4	Kudikadu	I to V	82	3
5	Sothikuppam	I to V	108	5
6	Malumiyarpettai O.T	I to V	95	3
7	Kuttakkarai O.T	I to V	46	2
8	Suthukulam O.T	I to V	136	6
9	Eachangadu	I to V	34	2
Middle School / Hr.Sec School				
10	Sangolikuppam	I to VIII	152	7
11	Semmankuppam	I to VIII	232	7
12	Rasappetai	I to VIII	147	7
13	Pachayankuppam	I to VIII	134	7
14	Seeman Thottam O.T	I to VIII	232	11
15	Karaikkadu Colony	I to VIII	307	9
16	Poodiankuppam	1 to XII	1147	30
17	Karaikadu	1 to XII	752	22
Total			3908	132

1.6. Eco-geological features:

1.6.1 Major Water bodies:

River Uppanar (Paravanar) originating from Perumal Eri flows along the Eastern boundary of SIPCOT Industrial area and joins with Bay of Bengal at Cuddalore Port. Fishing activity is carried out in this River. The River Uppanar is filled with sea back waters with high TDS content. The water source is not used for other activities.

1.6.2 Ecological parks, Sanctuaries, flora and fauna or any ecosystem:

Nil

1.63 Buildings or Monuments of Historical / archaeological / religious importance:

Nil

1.7 Industry Classification (no. of industries per 10 sq. km area or fraction)

1.7.1 Highly Polluting Industries (17 categories):

S.No	Name of the Industries	Category	Classification
1	M/s Clariant Chemicals (India) Ltd,	R/L	Dye & Dye intermediate
2	M/s. Tagros Chemicals India Limited, (Unit-I)	R/L	Pesticide
3	M/s Shasun Chemicals and drugs Ltd.,	R/L	Basic drugs & pharmaceuticals
4	M/s. Aurobindo Pharma Ltd.,	L	Pharmaceuticals intermediate

1.7.2 Red category industries (54 categories)

S.No	Name of the Industries	Category	Classification
Phase-I			
1	M/s. TANFAC Industries Ltd (AlF ₃ Plant)	R/L	Chemical
2	M/s. TANFAC Industries Ltd (Cryolite Plant)	R/L	Chemical
3	M/s. TANFAC Industries Ltd (Synthetic Organic Chemicals)	R/L	Chemical
4	M/s Asian Paints Limited (Penta Division)	R/L	Chemical
5	M/s Asian Paints Limited (Power Plant)	R/L	Power plants
6	M/s Brahmar Cellulose Products (P) Ltd,	R/L	Chemical
7	M/s Victory Chemicals Pvt Ltd	R/L	Chemical
8	M/s. G.S.R Products Limited	R/L	Chemical
9	M/s. Loyal Super Fabrics,	R/L	Textile Dyeing
10	M/s. Packaging India Private Limited	R/L	Electroplating
11	M/s Omnicast Precision Products Pvt Ltd,	R/L	Foundry
12	M/s. Tagros Chemicals India Limited,(Unit-II)	R/M	Chemical
13	Tagros Chemicals India Ltd(unit-III)	R/S	Pesticides formulation
14	Kumar Chemical Corporation	R/S	Chemical
15	MAB Metals	R/S	Aluminium / Brass circles

16	TamilNadu Pigments Limited	R/S	Pigments & intermediate
17	Pondicherry Alum & Chemicals Limited	R/S	Chemical
Phase-II			
18	M/s. Pandian Chemicals Ltd.	R/L	Chemical
19	M/s Arkema Peroxides India Private Ltd.,	R/L	Chemical
20	M/s. Bayer Material Science Private Limited	R/L	Chemical (synthetic resin)
21	M/s. Pioneer Jellice India Private Limited.	R/L	Chemical
22	M/s. Chemplast Sanmar Limited (PVC Plant)	R/L	PVC resin

1.7.3 Orange and Green category industries:

S.No	Name of the Industries	Category	Classification
1	Diamond Ice & Cold Storage	O/S	Ice Plant
2	Kousalya Ice Factory	O/S	Ice Plant
3	Igloo Ice	O/S	Ice Plant
4	Morgan Propack Ltd.,	O/S	Paper Products
5	Coastal Packers	G/S	Carton Box

WATER ENVIRONMENT

2. WATER ENVIRONMENT

2.1 Present status of water environment:

The analysis report on the following is enclosed in annexure - I

River Uppanar ROA	January'2009 to Dec'2009	January'2010 to July'2010
Marine water quality ROA	January'2009 to Dec'2009	January'2010 to July'2010
CUSECS ROA	April 2009 to March 2010	April 2010 to July 2010
Industries ROA	April 2009 to March 2010	April 2010 to July 2010

2.1.1 Water bodies:

- River Uppanar is monitored at two locations namely i) at the upstream side of the SIPCOT area & ii) at the downstream side of the SIPCOT area.
- Marine water quality is monitored by the Board at the following locations namely i) At the discharge point of CUSECS .ii) At the discharge point of M/s. Clariant Chemicals (I) Ltd and iii) At the sea water desalination plant reject discharge point of M/s. Chemplast Sanmar Ltd .

2.1.2 Present level of pollutants:

- No Industrial discharges into River Uppanar. The report shows the pH, BOD, COD, oil and grease, fluoride are found within the limit. No much variations in the quality of Uppanar river were noticed in the samples collected at Upstream & downstream locations.
- **National Geophysical Research Institute, (NGRI), Hyderabad, has conducted a Micro level Ground Water Quality / Ground water movement in Cuddalore SIPCOT, Tamilnadu during the year 2008.** Monitoring was conducted at 24 VES (Vertical electrical Sounding) and Multi Electrode Resistively Imaging (MERI) was carried in SIPCOT Cuddalore. The report states that the sub surface water at Kudikadu village is free from anthropogenic pollution. The report also concludes that Uppanar river and the water table in the western side of SIPCOT are almost the same. Hence there can be intrusion off the Uppanar river water in the dynamic conditions. A total of 125 wells were established for hydro

geological monitoring in and around SIPCOT, Cuddalore. Based on water level measurement both at pre and post monsoon it is concluded that the ground water movement is towards down Stream of Uppanar River. The piper and Wilcox plot reflects that the majority of the water samples (pre and post monsoon) belong to Sodium Chloride and Potassium Chloride type and falling in very high salinity category of Wilcox plot result the samples not suitable for irrigation. The influence of Uppanar River which is 50 mts from the industries plays a vital role in sub surface pollution. The Chemical analysis of Uppanar River water samples for the past 10 years shows that there are no considerable variations in Total Dissolved Solids. The TNPCB report of analysis also confirms the same.

- The Marine water quality report does not show any adverse impact due to discharge of treated trade effluent.
- A study on marine impact was conducted on July'2008 by Cuddalore SIPCOT Industries Association (CSIA), through the Institute of Ocean Management, Anna University, Chennai as the industries in SIPCOT discharges treated trade effluent into Sea through CUSECS Ltd., In the said report it was concluded that the waters are less polluted and provide the necessary environmental conditions for the marine life to flourish. It was also recommended for regular monitoring of water, air and sediment quality so as to assess long term impact if any caused to the environment.

2.1.3 Predominant sources contributing to various Pollutants:

No industrial sources contribute pollutants to River Uppanar.

2.2 Source of Water Pollution:

2.2.1 Industrial:

There are 20 industrial units in SIPCOT which generates trade effluent. Out of this 20 units, 10 units have provided Zero Liquid Discharge System (ZLDS). In this the trade effluent is treated in the full scale ETP provided in the units premises and the treated trade effluent is further evaporated through MEE and recovered as salts (or) treated through RO System followed by MEE and

Agitated Thin film Drier and recovered as salts to maintain zero discharge of trade effluent.

9 units treat the trade effluent in the full scale ETP provided in their premises and conveys the treated trade effluent to CUSECS Limited, which is formed by the industries as a common facility to collect, transport and discharge of the combined treated trade effluent into Bay of Bengal through pipeline. The CUSECS Limited receives the treated trade effluent from various industries in different sumps which is finally let into sea from final Sump-VI. This facility is being operated since January' 2000 onwards.

Remaining 1 unit, M/s. Clariant Chemicals India Ltd has independently provided marine disposal system for the disposal of treated trade effluent and functioning since the year 1991.

No unit discharges the treated trade effluent on land or to the River Uppanar.

M/s. Chemplast Sanmar Ltd., discharges the sea water desalination plant rejects back into sea through dedicated pipe line and diffuser system.

The performance of the waste water treatment units provided by the industries in SIPCOT based on the ROA of the treated trade effluent is as below.

S.No	Industries	Parameters exceeding the Marine disposal limits	
		2009-10	2010-11
1	TANFAC	TSS & Sulphate	Nil
2	Pandian Chemicals	TSS & Sulphides	Nil
3	Bayer	Nil	Nil
4	Clariant	TSS & Sulphate	Nil
5	SPIC	TSS , COD & Sulphide	Unit not operated since January'2010
6	Aurobindo Pharma	TSS & Sulphide	Nil
7	Pioneer Jellice	TSS,BOD,COD,Sulphides, Ammoniacal Nitrogen& TKN	TSS, BOD, COD, Ammoniacal Nitrogen, TKN, Sulphide

8	Loyal	TSS, BOD, COD & Sulphide	All parameters within the limits except TRC.
9	Arkema	TSS & Sulphate	Nil
10	CUSECS	TSS, BOD, COD, Ammoniacal Nitrogen, TKN, Sulphide	All parameters within the limits except TRC.

2.2.2 Domestic :

The domestic sewage generated from the industrial units are treated through Septic tank followed by dispersion trench / soak pit. Units namely Tagros, Shasun , GSR , & Chemplast have provided dedicated full scale STP for the treatment and disposal of domestic sewage. Industries such as Asian Paints & Clariant Chemicals treat the domestic sewage along with the trade effluent in the ETP.

2.2.3 Others: (agricultural run off, leachate from MSW dump, illegal dump site.

The Cuddalore Municipal solid waste dump site is located at the northern side of the SIPCOT Phase-I. The area of the dump site is 1.9 acres and 20 MT / day of Municipal solid waste is being dumped in the dump site by the Cuddalore Municipality. There is a possibility of ground water pollution due to leachate generated during rains.

2.2.4 Impact on surrounding area:

The wastewater generated from the industries located in SIPCOT area area being treated and disposed through pipeline into Bay of Bengal for marine disposal. No discharge of effluent into River Uppanar, on land or into SIPCOT drains.

2.3 Details of water polluting industries in the area / cluster.

S.No	Name of the Industries	Classification	Qty of Effluent in KLD	Point of Discharge
1	M/s Clariant Chemicals (India) Ltd,	Dye & Dye intermediate	1000	Marine
2	M/s. Aurobindo Pharma Ltd.,	Pharma intermediate	56.52	CUSECS
3	M/s. TANFAC Industries Ltd (AlF ₃ Plant)	Chemical	1212	CUSECS
4	M/s. TANFAC Industries Ltd (Cryolite Plant)	Chemical	363	CUSECS
5	M/s. Loyal Super Fabrics,	Textile Dyeing	618	CUSECS
6	M/s. Pandian Chemicals Ltd.	Chemical	23	CUSECS
7	M/s Arkema Peroxides India Private Ltd.,	Chemical	85	CUSECS
8	M/s. Bayer Material Science Private	Chemical	75	CUSECS
9	M/s. Pioneer Jellice India Private Limited.	Chemical	1200	CUSECS
10	Spic Ltd., (Pharma Division)	Pharmaceuticals	3650	CUSECS (not in operation)
11	M/s. Tagros Chemicals India Limited,(Unit-I)	Pesticide	110	ZLD
12	M/s. Tagros Chemicals India Limited,(Unit-II)	Chemical (R/M)	15	ZLD
13	M/s Shasun Chemicals and drugs Ltd.,	Pharmaceuticals	51	ZLD
14	M/s Asian Paints Limited (Penta Division)	Chemical	135	ZLD
15	M/s Brahmar Cellulose Products (P) Ltd,	Chemical	8	ZLD
16	M/s. G.S.R Products Ltd	Chemical	14.55	ZLD
17	M/s.Tantech Agro Chemicals Limited	Chemical	7	ZLD (not in operation)

18	M/s. Packaging India Private Limited	Electroplating	5	ZLD
19	M/s. Chemplast Sanmar Limited (PVC Plant)	PVC resin	2818	ZLD
20	M/s. TANFAC Industries Ltd (Synthetic organic Chemicals)	Chemical	135	ZLD

2.4 Effluent Disposal Methods- Recipient water bodies:

The trade effluent generated from the industries is treated and disposed into Bay of Bengal for marine disposal.

2.5 Quantification of wastewater pollution load and relative contribution by different sources viz industrial/ domestic

The treated trade effluent from SIPCOT industrial units are being discharged into sea through two outlets as noted below.

1. Marine discharge line of M/s. Clariant Chemicals India Ltd.,
2. Marine discharge line of CUSECS carrying treated trade effluent of 9 units.

The pollution load contributed by the above two sources of industrial outlets are quantified in respect of BOD, COD, TSS and sulphides for the period 2009-10 & 2010-11 and tabulated as below.

Year	Clariant Chemicals			Cusecs			
	BOD (Kg/day)	COD (Kg/day)	TSS (Kg/day)	BOD (Kg/day)	COD (Kg/day)	TSS (Kg/day)	Sulphides (Kg/day)
2009-10	1.485	11.07	19.1	591	1747.86	1254.14	32.68
2010-11	2.39	48.61	50.235	307.18	1382.37	637.46	24.32

2.6 Action Plan for compliance and control of Pollution:

2.6.1 Existing infrastructure facilities:

- All industries generating trade effluent are provided with full scale treatment facilities.
- 9 units let out the treated trade effluent into CUSECS Ltd., which collects the treated trade effluent from industries through dedicated pipelines net works , sumps and pipeline to discharge into sea at a distance of about 1 Km into sea.
- 1 unit has a separate pipe line to discharge their treated trade effluent into sea through dedicated pipeline laid about 1 Km into the sea.
- The units which have provided ZLDS have provided full scale ETP, MEE & salt recovery system or provided with RO units, MEE & salt recovery system to maintain zero discharge of trade effluent.
- All the units discharging the effluent into CUSECS /marine disposal are provided with EMFM to monitor the flow rate.
- CUSECS is provided with EMFM & pH monitor at the discharge line into sea.
- The units which have not achieved the disposal standards have started implementation of the action plan as below.

i) To reduce – BOD, COD & Sulphides

Sl No	Name	Action proposed	Cost In Lakhs.	Status on implementation of Action plan
1	Pioneer Jellice	Additional anaerobic digester proposed.	200	Plant under construction, reported to comply by January'2011
2	Loyal Super Fabrics	Introducing Chlorination treatment.	23.5	Chlorination treatment under operation, All parameters within the limits except TRC.

ii) **To reduce – TSS**

Sl No	Name	Action proposed	Cost In Lakhs.	Remarks
1	Arkema Peroxides	To provide Filter system.	1.5	Work Completed & commissioned. All parameters within the limits.
2	Pandian Chemicals	Sand filter proposed	2	Work Completed. All parameters within the limits.
3	Pioneer Jellice	Additional anaerobic digester proposed.	200	Plant under construction, reported to comply by January 2011

iii) **To reduce – TKN & Ammonical Nitrogen**

Sl No	Name	Action proposed	Cost In Lakhs.	Remarks
1	Pioneer Jellice	Additional anaerobic digester proposed.	200	Plant under construction, reported to comply by January 2011

iv) **Action plan for meeting marine disposal standards in respect of TSS, BOD, COD, Ammonical Nitrogen, etc., in CUSECS need to be included in action plan.**

The main function of the CUSECS is to collect the treated trade effluent from all the member units and to dispose the same into the sea. There is no treatment in the CUSECS. The designated capacity of the scheme is to pump 500 m³ /hr. of treated trade effluent into the sea. Eight units discharge their treated trade effluent through CUSECS, which is disposed 1 k.m. into the sea.

Due to continuous insistence and action of the Board, various action plans were implemented by all industries, which have improved the performance of effluent treatment. The Report of Analysis of samples collected from CUSECS on 25.10.2010 reveals that all the parameters except Total Residual Chlorine (1.77) are within the limits prescribed by the Board.

2.6.2 Pollution control measures installed by the unit:

S.No	Industries	Treatment units	Disposal
1	M/s Clariant Chemicals (India) Ltd	Full scale Physico chemical treatment units	Marine
2	M/s. Aurobindo Pharma Ltd.,	Full scale Physico chemical treatment units	Marine disposal through CUSECS
3	M/s. TANFAC Industries Ltd (AlF ₃ Plant)	Full scale Physico chemical treatment units	Marine disposal through CUSECS
4	M/s. TANFAC Industries Ltd (Cryolite Plant)		
5	M/s. Loyal Super Fabrics,	Full scale Physico chemical treatment units	Marine disposal through CUSECS
6	M/s. Pandian Chemicals Ltd.	Full scale Physico chemical treatment units	Marine disposal through CUSECS
7	M/s Arkema Peroxides India Private Ltd.,	Full scale Physico chemical treatment units	Marine disposal through CUSECS
8	M/s. Bayer Material Science Private	Full scale Physico chemical treatment units	Marine disposal through CUSECS
9	M/s. Pioneer Jellice India Private Limited.	Full scale Physico chemical treatment units	Marine disposal through CUSECS
10	Spic Ltd., (Pharma Division)	Full scale Physico chemical treatment units	Marine disposal through CUSECS
11	M/s. Tagros Chemicals India Limited,(Unit-I)	Neutralisation, MEE & Centrifuge	ZLDS
12	M/s. Tagros Chemicals India Limited,(Unit-II)		
13	M/s Shasun Chemicals and drugs Ltd.,	Full scale Physico chemical treatment units, RO , MEE & ATFD	ZLDS
14	M/s Asian Paints Limited (Penta Division)	Full scale Physico chemical treatment units, RO , MEE & ATFD	ZLDS
15	M/s Brahmar Cellulose Products (P) Ltd,	Full scale Physico chemical treatment units, RO , MEE & SEP	ZLDS
16	M/s. G.S.R Products Limited.	Neutralisation & Evaporator reactor	ZLDS
17	M/s.Tantech Agro Chemicals Limited,	Full scale Physico chemical treatment units, RO & Evaporator	ZLDS
18	M/s. Packaging India Private Limited	Full scale Physico chemical treatment units, RO & SEP	ZLDS

19	M/s. Chemplast Sanmar Limited (PVC Plant)	Full scale Physico chemical treatment units, RO, MEE & Nutch filter	ZLDS
20	M/s. TANFAC Industries Ltd (Synthetic organic Chemicals)	Full scale Physico chemical treatment units, MEE & ATFD	ZLDS

2.6.3 Technological Intervention:

i) To reduce – BOD, COD & Sulphides

Sl No	Name	Action proposed	Cost In Lakhs.	Status
1	Pioneer Jellice	Additional anaerobic digester proposed.	200	Plant under construction, reported to comply by January'2011
2	Loyal Super Fabrics	Introducing Chlorination treatment.	23.5	Chlorination treatment under operation, All parameters within the limits except TRC.

ii) To reduce – TSS

Sl No	Name	Action proposed	Cost In Lakhs.	Status.
1	Arkema Peroxides	To provide Filter system.	1.5	Work Completed & commissioned. All parameters within the limits.
2	Pandian Chemicals	Sand filter proposed	2	Work Completed. All parameters within the limits.
3	Pioneer Jellice	Additional anaerobic digester proposed.	200	Plant under construction, reported to comply by January'2011

iii) To reduce – TKN & Ammonical Nitrogen

Sl No	Name	Action proposed	Cost In Lakhs.	Status
1	Pioneer Jellice	Additional anaerobic digester proposed.	200	Plant under construction, reported to comply by January'2011

- **The report regarding improvement in effluent quality due to "Provision of Chlorination treatment" in M/s. Loyal Super Fabrics.**

For improving the effluent quality, the unit has carried out chlorination cum electrolytic process treatment system. On introduction of chlorination treatment, the sludge generation has drastically been reduced to 150 Kg/Day. The Report of Analysis of samples carried out by M/s. SGS Lab Private Limited, Chennai, reveals that the pollutants (BOD, COD, Sulphides) parameters satisfies marine disposal standards.

2.6.4 Infrastructural Renewal:

2.6.4.1 Need of up gradation of existing facilities:

- Adequate storm water drains to be provided within SIPCOT area.
- Existing storm water drains within SIPCOT area to be renovated & desilted by SIPCOT authorities.
- SIPCOT existing service road to be repaired and maintained.

2.6.5 Impact on CEPI score after installation of full fledged pollution control measures.

A1	A2	A	B1	B2	B3	B	C1	C2	C3	C	D	Water CEPI
2	5	10	3	3	0	6	3	3	5	14	20	50

2.6.6 Self monitoring system in industries:

- Laboratory facility provided by the units to monitor pH, COD Chlorides , Sulphates
- EMFM is provided by the units to monitor flow rate of trade effluent discharged for marine disposal.

2.6.7 Data linkages to SPCB (of monitoring devices):

The industries in SIPCOT was requested to connect the EMFM and pH sensors real time on line data to Care Air Centre at Board office , Chennai. The details of industries provided with on line flow meter & pH sensors to be connected is as below.

S. No	Industries	Sensors to be connected to Care Air Centre	Present Status
1	Asian Paints	RO permeate EMFM & pH	Connected
2	Clariant Chemicals	EMFM & pH of effluent discharge into sea	Connected
3	G.S.R Products	EMFM & pH of sewage discharge into CUSECS	Connected
4	SPIC Ltd(Pharma)	EMFM & pH of effluent discharge into CUSECS	Plant not in operation
5	Tagros Chemicals	EMFM & pH of sewage discharge into CUSECS	Connected
6	Shasun Chemicals	RO permeate EMFM & pH	Connected
7	Aurobindo Pharma	EMFM & pH of effluent discharge into CUSECS	Connected
8	Chemplast PVC Plant	EMFM & pH of sewage discharge line. RO permeate EMFM & pH of effluent. Desalination plant reject discharge EMFM & pH into sea.	Connected

9	TANFAC Industries	EMFM & pH of effluent discharge into CUSECS	Connected
10	Pandian Chemicals	EMFM & pH of effluent discharge into CUSECS	Connected
11	Loyal Super fabrics	EMFM & pH of effluent discharge into CUSECS	Connected
12	Bayer Material Science	EMFM & pH of effluent discharge into CUSECS	Connected
13	Pioneer Jellice India Ltd	EMFM, pH, temperature of effluent discharge into CUSECS.	Connected
14	Arkema Peroxide	EMFM & pH of effluent discharge into CUSECS.	Connected
15	CUSECS Ltd	EMFM, pH of effluent discharge from sump VI to Sea.	Connected

2.6.8 Power back up provided at all pumping stations for CETPs & STPs to avoid overflow of untreated effluent during power failure

M/S CUSECS has provided standby generators in all the pumping sumps. CUSECS is a common facility to collect, convey and dispose the treated trade effluent into sea for marine disposal. The individual industries are equipped with Generator sets to operate ETP continuously.

AIR ENVIRONMENT

3. AIR ENVIRONMENT

3.1 Present status of Air environment

The following analysis report is enclosed in Annexure-II

Industries AAQ report as conducted by TNPCB	2009-2010	2010-2011
Industries AAQ report as per revised Notification conducted by MoEF approved Lab	-	2010-2011
Ambient VOC report as done by MoEF approved Lab	2009	2010

3.11 Critical locations for air quality monitoring

- Ambient air quality in SIPCOT, Cuddalore is monitored by the Board by installation of one number CAAQM station.
- TNPCB monitors the AAQ / stack / Noise level within the premises of industries once in a year.
- Third party Monitoring done by Industries through MOEF approved Labs to monitor Volatile Organic Compounds (VOC).
- TVOC meter is installed by the unit to monitor Total Volatile Organic Compound (TVOC) emission.
- M/s. Chemplast Sanmar Ltd monitors VCM in and around SIPCOT area during unloading of VCM raw material from ship to site storage tank by using Mobile GC van.
- M/s. Chemplast Sanmar Ltd monitors VCM in the work place on continuous basis using GC.
- TNPC Board monitors VCM along the stretch of VCM pipeline at Emergency shut down valve, at land fall point, at port control building, T-joint near River Uppanar and Emergency shut down valve near VCM storage tank during unloading of VCM.

3.1.2 Present level of pollutants in air:

- The Report of analysis of Air quality monitoring done by the Board during 2009-10 & 2010-2011 reveals that the critical parameters are within the Ambient Air Quality standards prescribed by the Board. The AAQ monitoring done by the Industries as per latest MoEF Notification dated 16.11.2009 through MoEF approved Laboratories reveals that the parameters are within the standards.
- The VCM Monitoring done by the Board during unloading of VCM were found as not detected.
- The maximum VOC emission are contributed by M/s. Shasun Chemicals and Drugs Ltd., & M/s. Tagros Chemicals India Ltd which utilizes more number of solvents in their production process.
- The concentration of Total Hydro Carbon (THC) as monitored by the industries through external MoEF approved Lab was found not detected in ppm level.

3.1.3 Predominant sources contributing to various pollutants:

S.No	Pollutant	Sources
1	Chlorine	Chloronil plant
2	Hydrogen Fluoride	Aluminium Fluoride plant, Hydrogen Fluoride plant, Speciality Fluoride plant
3	SO ₂ & NO _x	Boilers
4	SPM	Boilers
5	VCM	PVC plant
6	VOC	Pesticide plant , Pharmaceutical plant

3.2 Sources of air Pollution: Industrial & Transportation

SIPCOT Industrial Complex, Cuddalore consists of the following types of industries such as Pesticides, Pharmaceuticals, Pharma intermediates, Inorganic Chemicals, Organic Chemicals, PVC manufacturing etc., where most of the industries utilizes organic solvents in their process activities. Due to the handling

of Organic Solvents of high volatile nature, emission of Volatile Organic Compounds (VOC's) generally exists in the ambient air in the vicinity of SIPCOT area. This mainly causes odour and likely to affect human health due to carcinogenic effects of some hazardous air pollutants.

The existence of Chloroform, Carbon Tetra Chloride, Methylene Dichloride Toluene , Hexane , Chlorobenzene , Ethylene Dichloride and etc., in the ambient air was detected in the VOC monitoring survey conducted through TamilNadu Pollution Control Board, NEERI, Nagpur and other external agencies. Hence reduction of VOCs level is to be seriously concerned.

Apart from the above air pollutants, SO₂, NO_x, SPM, Hydrogen Fluoride (HF), Acid Mist, Chlorine are also let out from the industrial units which are generally within the standards prescribed by the Board.

The details of the number of heavy vehicles engaged by the industrial units is tabulated below.

S.No	Name of the unit	Vehicles per day
1	Clariant Chemicals India Ltd.,	6
2	Tagros Chemicals India Ltd (unit-I)	10
3	TANFAC Industries Limited	40
4	Loyal Super Fabrics	4
5	Aurobindo Pharma Limited	1
6	Asian Paints Limited	7
7	Shasun Chemicals and Drugs Limited	20
8	Brahmmar Cellulose Products (P) Ltd.,	3
9	Victory Chemicals Private Limited	1
10	Packaging India Limited	1
11	G.S.R.Products Limited	1
12	Arkema Peroxides India Private Ltd.,	8
13	Bayer Material Science Private Ltd.,	4
14	Pandian Chemicals Limited	1
15	Pioneer Jellice India Private Limited	10
16	Chemplast Sanmar Limited, PVC Plant	30
Total		147

3.3 Air Polluting Industries in SIPCOT

S.No	Industries	Type
1	M/s Clariant Chemicals (India) Ltd,	Dye & Dye intermediate
2	M/s. Aurobindo Pharma Ltd.,	Pharma
3	M/s. TANFAC Industries Ltd	Chemical
4	M/s. Loyal Super Fabrics,	Textile dyeing
5	M/s. Pandian Chemicals Ltd.	Chemical
6	M/s. Bayer Material Science Private	Chemical
7	M/s. Pioneer Jellice India Private Limited.	Chemical
8	Spic Ltd., (Pharma Division)	Pharma
9	M/s. Tagros Chemicals India Limited,(Unit-I)	Pesticide
10	M/s Shasun Chemicals and drugs Ltd.,	Pharma
11	M/s Asian Paints Limited (Penta Division)	Chemical
12	M/s Brahmar Cellulose Products (P) Ltd,	Chemical
13	M/s. G.S.R Products Limited.	Chemical
14	M/s. Chemplast Sanmar Limited (PVC Plant)	PVC resin

3.4 Impact of activities of near by area on the CEPI area

Nil

3.5 Quantification of air pollution load and relative contribution by different sources:

The pollution load of **SPM, SO₂ & NO_x** let out through different source of industries is tabulated below. The details are given based on the latest stack monitoring reports of industrial units conducted by TNPCB.

Year	Industries	SPM Kg/day	SO ₂ Kg/day	NO _x
2010	TANFAC	174.82	469.82	21.735
2010	Clariant Chemicals	51.33	35.1	4.44
2010	Pioneer	55.03	4.16	24.21
2010	Loyal	111.11	0	57.48
2010	Asian Paints	5.25	23.22	29.79

2010	Bayer	2.36	0.42	0.28
2010	Shasun	40.83	55.84	0.96
2010	Omnicast	0.97	0.57	0.73
2010	Aurobindo pharma	2.48	0.38	1.71
2010	GSR	3.21	31.95	0.68
2010	Pandian	8.14	0	1.51
2010	Victory	56.55	85.7	9.73
2009	Brahmmar	18.39	3.72	1.28
2009	SPIC	37.44	33.28	6.93
2010	Tagros	47.97	8.54	0.8
2010	Packaging	0.97	0.45	0.01
2010	Chemplast	114.48	92.06	13.41
Total		731.33	845.21	175.685

3.6 Action Plan for compliance and control of pollution:

To reduce – Fluoride

Sl No	Name	Action proposed	Cost In Lakhs.	Present status
1	TANFAC Industries	Dry scrubber system proposed.	35	Scrubber installed & commissioned.

To reduce SO₂

Sl No	Name	Action proposed	Cost In Lakhs.	Remarks
1	Victory Chemicals,	To convert fuel from furnace oil to Bio-fuel.	10	3 months
2	Clariant Chemicals	Proposed to go for Bio Fuel	15	New boiler proposed & commission by 12/2010.

To reduce odour

Sl No	Name	Action proposed	Cost In Lakhs.	Status
1	SPIC Ltd., (Pharmaceutical Division).	Double drum proposed	100	Provided.
2	Pioneer Jellice	Incineration through Boiler.	1.5	Work Completed & commissioned.

To reduce VOC

Sl No	Name	Action proposed	Cost in Lakhs.	Status
1	Asian Paints	To connect all storage tanks vents for reuse.	2.39	Work Completed & commissioned.
2	Shasun Chemicals & Drugs	a) Stabilisation of Waste.	100	Stabilisation being done
		b) Bio- Filter modification.	50	Bio Filter changed & Carbon filter provided.
		c) Aeration tank to be covered	50	Work Completed & commissioned.
		d) Reduction of VOC like Chloroform- study under progress.	100	By Dec 2010
		e) Process modification by changing raw materials.	300	By Dec 2010
3	Tagros Chemicals	Solvent Recovery System proposed.	145	System provided, Performance to be assessed

3.6.1 Existing infrastructure facilities – Ambient air quality monitoring network

- High volume samplers are installed by major units to monitor ambient air quality.
- TVOC monitors are provided by the following units in the ambient air.

S.No	Industries	TVOC sensors
1	Asian Paints	1 No
2	Clariant Chemicals	1 No
3	G.S.R Products	1 No
4	SPIC Ltd(Pharma)	2 Nos
5	Tagros Chemicals	1 No
6	Shasun Chemicals	3 Nos
7	Aurobindo Pharma	1 No

The details on the on-line stack monitors provided by the units is listed below.

Industries	Source of Emission	On-Line stack Monitors
Clariant Chemicals	Chlorine scrubber stack	Chlorine
TANFAC Industries	AlF ₃ plant Central Absorption system stack	Hydrogen Fluoride
	HF plant Central Absorption system stack	Hydrogen Fluoride
	SAP Final Absorption Tower stack	SO ₂
	Boiler stack – 10 TPH	SPM & SO ₂
Asian Paints	Boiler Stack – 16 TPH	SPM, SO ₂ , NO _x & CO
Pandian Chemicals	Electrolytic Cell scrubber stack	Chlorine

Chemplast Sanmar Ltd.	Boiler stack – 38 TPH	SPM, SO ₂ & NO _x
	PVC Drier stack	SPM & VCM
	VGA stack	VCM
	Emergency Vent	VCM

3.6.2 Pollution control measures installed by the individual sources of pollution

	Sources of Emission	APC Measures Provided	Stack Details	
			Dia in "m"	Ht in m"
Asian Paints	Sodium Formate (SF) Drier	Scrubber & stack	0.10	18
	Mono pentaerythritol Drier	Scrubber & stack	0.20	12
	Di- pentaerythritol Drier	Scrubber & stack	0.25	18
	FBD Drier	Dust Collector & stack	0.10	10.5 °
	Boiler –8 T/Hr oil fired	Common stack	1.00	42
	Boiler-16 T/hr Coal fired *	Multiclone separators, bag filter & stack.	1.00	42
	Boiler 14 T/Hr Coal fired	Multiclone separators, bag filters & stack	1.20	50

	Sources of emission	APC Measures provided	Stack Detail	
			Dia (in mm)	Ht (in 'm')
Clariant Chemical	I. <u>Chloronil plant</u> Reactor emission	Two stage scrubber & stack	400	20
	Chlorine Handling area	Scrubber & stack	200	20
	II. <u>Pigment Blue plant</u> i) Reactors (acid fumes)	Wet scrubber, cyclone & stack	315	15
	Boiler 3 T/Hr Coal fired	Cyclone separator & stack	1000	15

	Sources of Emission	APC Measures provided	Stack	Details
			Dimension (in mm.)	Height from GL (in Meter)
G.S.R. Products	Process Reactors (8 nos)	Packed Bed Alkali Scrubber, Venturi Scrubber & Stack	75	27

	Source of emission	APC measures provided	Stack details	
			Dia in "mm"	Height in "m"
Tagros Chemical	HCl / SO ₂ emission Plant-I (CMAC) Reactors(R214 R218,R214A) vents	HCl scrubber followed by SO ₂ scrubber	50	4 m
	Plant-I (CMAC) Reactors (R203 & R204) vents	HCl scrubber followed by SO ₂ scrubber		
	Plant-I (CMAC) Reactors (R204) vents	HCl scrubber followed by SO ₂ scrubber		
	Plant-2 (Hexaconazole) Reactors R304 R-314)	HCl scrubber followed by SO ₂ scrubber		
	Plant-5 (Delta methrin) Reactors (R104A &R113)	HCl scrubber followed by SO ₂ scrubber		
	Plant-2 {Permethrin} Reactor (R220)	HCl scrubber		
	Boiler (Wood fired) 6 ton capacity	Dust Collector		
	Boiler 8T/hr (Coal fired)	Cyclone separator	800	30 m
	Boiler (Wood fired) 6 ton capacity	Dust Collector	800	30 m
	Boiler (Wood fired) 4 ton capacity	Wet Scrubber		

	Sources of Emission	APC Measures provided	Stack Details	
			Dia in mm	Ht in 'm'
Shasun Chemical	Reactor emission from Block-I & Block-II Acid fumes	Common Scrubber & stack	100	8
	Reactor emission From Production Block I & II	primary & Secondary activated carbon filter & tail end SS ACF & stack	100	8
	Mercaptan emission from Block-I	Venturi scrubber , two stage packed bed scrubber, & a packed Bed scrubber and stack	300	27
	Reactor emission	Scrubber & stack	100	12
	Reactor emission Acid fumes	Two stage Scrubber & stack	100	13
	Reactor emission	scrubber	-	-

	Sources of Emission	APC Measures Provided	Stack Details	
			Dia in mm	Height in 'm'
Aurobindo Pharma	9 Process Reactors vents & 5 Process Reactors vents	Scrubber followed by stack	100	3.7

	Sources of Emission	APC Measures Provided	Stack Details	
			Dia (in mm)	Height (in meter)
Chemplast Sanmar Ltd.,(PVC)	Vent Gas Absorption (VGA) [VCM Recovery section]	Stack	38	20
	PVC Drier section	Multi cyclone followed by wet scrubber & stack	1270	44
	Boiler 38 T/hr	ESP	1300	54
	a. Coal handling (Coal conveyor)	Bag filter & stack	425	15.5
	To handle fugitive emissions in the transfer points	Bag filter & stack	335	22.75
	PVC Bagging section	Reverse jet bag filter-3 Nos provided	-	-
	Bagging Machine - 3 Nos			
Product silo (3 Nos)	Bin vent Filter (each)	-	-	

	Source of emission	APC Measures provided	Stack details	
			Dia in 'mm'	Ht in M.
TANFAC	Aluminium hydroxide drier	Cyclone separator and bag filter.	289	24
	Fluorspar drier	Cyclone separator and bag filter	434	28
	HF Kiln	stack	1200	40
	Central Absorbtion system Al F3 (HF scrubber)	Stack provided with packed tower.	199	35
	Central Absorption system HFL (HF scrubber)	Stack provided with packed tower.	199	35
	Final absorption tower-I SAP plant-I	Scrubber followed by stack	500	30.5
	Final absorption tower-II SAP plant-II	Scrubber followed by stack	500	30.5
	Anhydrite absorption	Scrubber followed by stack	220	23.4
	Boiler- 10 TPH Coal fired	Dust collector followed by stack	1025	40

	*Sources of Emission	APC Measures provided	Stack	Details
			Dia (in mm)	Ht (in m)
Speciality Fluoride Plant	Misc. Fluoride plant(SFL)	Common Scrubber & stack	200	24
	Misc. Fluoride plant (SFL)			
	BF3 Etherate / complex *	Scrubber & stack	200 dia	9
	Spray Drier	Cyclone dust collector follower by scrubber & stack	675 dia	26
	Fluidised bed drier	Bag filter & cyclone separator followed by stack	200 dia	13

	Source of emission	APC Measures Provided	Stack Details	
			Dia (in mm)	Ht in 'M'
Synthetic Organic Chemicals	Reactor & HF removal column of IBAP plant	Packed scrubber & Venturi scrubber followed by stack	300	32
	Distillation system of IBAP plant	Vent condensers 3 Nos	-	-
	HCl/HBr emissions (from reactors in 3-Phenoxy 4-Fluoro benzaldehyde plant, 4,4-Difluoro benzophenone plant, Parabromo fluoro benzene plant, & Metabromo anizole plant)	HCl/HBr packed scrubber	-	-
	Reactor vent (in 3-Phenoxy 4-Fluoro benzaldehyde plant, 4,4-Difluoro benzophenone plant, Parabromo fluoro benzene plant, & Metabromo anizole plant) & HCl/HBr packed scrubber vent	Packed scrubber & Venturi scrubber followed by stack	300	32
	EDC, MEG & Toluene storage tanks	Vent condensers for each storage tanks	-	-

	Sources of Emission	APC Measures Provided	Stack Details	
			Dia (in mm)	Ht (in meter)
Pandian Chemicals	Electrolyte Cells	Packed Bed Alkali Scrubber followed by a Stack	150	10
	Boiler – 1.5 Tons / Hr - 1 No	Cyclone Separator followed by a Stack	300	30
	Fluidized Bed Drier	In built bag filter chamber followed by a Stack	250	10

	Sources of emission	APC measures provided	Stack Details	
			Dia in mm	Ht in 'm'
Brahmmar Cellulose	Spray drier stack	Cyclone separators & stack	1025 dia	30

Omnicast	Sources of Emission	APC Measures Provided	Stack	Details
			Dia (in mm)	Ht in 'm'
	Shell baking Furnaces-2Nos	Scrubber followed by common Stack	200	13

Packaging India	Sources of Emission Existing	APC Measures Provided	Stack Details	
			Dia (in mm)	Ht in 'm'
	Attached to chrome plating section	Wet scrubber & stack	300	15

	Sources of emission	APC Measures provided	Stack Details	
			Dia (in mm)	Ht (in 'm')
Loyal Super	Thermic Fluid Heater 30 lakh K.Cal (wood fired)	Dust collector & common Wet bottom scrubber	1300	25
	Thermic Fluid Heater 20 lakh K.Cal (wood fired)	Dust collector & common Wet bottom scrubber		
	Boiler -4 T/hr (wood Fired)	Dust collector & common Wet bottom scrubber	850	30
	Boiler-3 T/Hr (wood Fired)	Dust collector & commonWet bottom scrubber		

	Sources of Emission	APC Measures Provided	Stack Details	
			Dia (in mm)	Ht (in 'm')
Bayer	Extruder and finished products receiving Silo	Wet Scrubber followed by stack	500	16.75

	Sources of Emission Existing	APC Measures Provided	Stack Details	
			Dia (in mm)	Ht (in 'm')
Pioneer Jellice	Boiler 15 T/hr Coal fired	Mechanical dust collector & wet bottom scrubber	1000	30
	Boiler 6 T/hr Wood Fired	Mechanical dust collector & wet bottom scrubber		

Victory Chemicals	Sources of Emission	APC Measures Provided	Stack Details	
			Dia (in mm)	Ht (in 'm')
	Furnace (Rotary Kiln)	Bag filters & stack	600	21.0
	Thermic Fluid Heater	Cyclone dust collector & Stack	600	18
	Boiler – -2.5 TPH.	Mechanical dust collector & Stack	600	14.0

3.6.3 Technological Intervention

3.6.3.1 Inventorisation of prominent industries with technological gaps

1. M/s. TANFAC Industries
2. M/s. Victory Chemicals Ltd
3. M/s. Clariant Chemicals India Ltd.,
4. M/s. SPIC Ltd., (Pharmaceuticals Division)
5. M/s. Pioneer Jellice India (P) Ltd.,
6. M/s. Asian Paints Ltd.,
7. M/s. Shasun Chemicals & Drugs Ltd.,
8. M/s. Tagros Chemicals India Ltd.,

3.6.3.2 Identification of low cost and advanced cleaner technology for air pollution control

Industry	Air pollutant	Low cost & cleaner technology	Status
TANFAC Industries	Fluoride	Dry scrubber system	Provided
Victory Chemicals	SO ₂	furnace oil to Bio-fuel conversion	
Clariant Chemicals	SO ₂	Coal to Bio Fuel conversion	
SPIC Ltd.,	Mycellia odour	Double drum drier	Provided
Pioneer Jellice	Bone odour	Incineration through Boiler.	Commissioned

Asian Paints	VOC	To connect all storage tanks vents for reuse.	Connected
Shasun Chemicals	VOC	a) Stabilisation of Waste.	Being done
		b) Bio- Filter modification.	Done
		c) Aeration tank to be covered	Done
		d) Reduction of VOC like Chloroform- study under progress.	-
		e) Process modification by changing raw materials.	-
Tagros Chemicals	VOC	Solvent Recovery System	Provided

➤ **Action taken by the industries for prevention of solvent leakage and control of solvent emission.**

M/s. Shasun Pharmaceuticals Limited, Cuddalore -

1. All the process operations are done in a closed system. The transfer of mass initially done by pressure (Air/Nitrogen) transfer has been modified to pump transfer. This minimizes the VOC emission to the atmosphere.
2. The reactors / Tanks have been provided with vent heat exchangers to condense the escaped solvent. The solvent thus collected is reused in process.
3. The vent line of the mercaptan reactors is connected to a primary scrubber, which is a venturi scrubber, followed by double stage packed column.
4. The material of construction of mercaptan scrubber is changed from FRP to SS with minimum flanges to avoid leak and the scrubbing media is cooled and circulated to increase the scrubbing efficiency.
5. All-solvent storage tanks provided with flame arrestors and are in closed system of transfer through pumps fitted with Mechanical seals.

6. The distillation reactors are connected with rupture disc before safety releasing valve to avoid any leakage of solvent to atmosphere.
7. The unit is conducting regular Ultrasonic thickness test for all solvent line for preventing solvent leakage.
8. The pump glands and reactor glands are converted from Gland packing to Mechanical seals. This prevents the leakage of solvents.
9. The unit is conducting regular leak detection and repair program there by controlling the emissions from the joints to avoid the leak using PID meters for better control of fugitive emissions.
10. The equalization tank which is normally open is completely closed and the vent of the tank is taken through a blower and vented out by passing through Carbon adsorption bed, there by the emission to the atmosphere is reduced.
11. The fugitive emission vents are passed through series of Carbon adsorption towers before it is let to the atmosphere.

M/s. Asian Paints Limited (Penta Division).

1. Control valve into solvent line has been replaced with a glandless valve to eliminate fugitive emission.
2. The solvents are stored under nitrogen blanketing to eliminate fugitive emission.
3. Periodical leak test of flanges and manholes are being carried out.
4. Works spot monitoring for fugitive emission is being carried out by authorized MoEF Lab.
5. Material balance is being carried out weekly basis to identified gaps between receipt and consumption of solvents.
6. The unit has provision of 'rupture discs' upstream of safety valves located on the acetaldehyde storage tanks to eliminate fugitive emission.

M/s. Tagros Chemicals India Ltd.,

1. The unit has provided three condensers for all solvent recovery systems with circulation of cooling water, chilled water and Chilled brine to improve the recovery to above 98%. Vents of all solvent tanks are connected to a separate recovery system.
2. The unit has additionally installed Solvents Recovery systems by providing secondary & Tertiary Condensers with Chilled water circulations & Chilled brine and followed by Common vent chiller systems in respective of solvents storage tanks & reactors. The recovered solvents are recycled back to the process.
3. All Reactors have been provided with mechanical seals to avoid VOC Emission to atmosphere.
4. All process operations are carried out in two condensers, first one with cooling media and second one with sub-cooled medium with chilled water/ chilled brine up to -20° c to +5° c to avoid organic vapor losses and vapor exposure, thereby avoiding smell and VOC emissions.
5. Nitrogen Blanketing System is used to contain the Volatile Organic Vapor emissions (VOC) from the storage tank.
6. The unit has provided on line TVOC sensor with Data logger system. Also high VOC alarm system provided to monitor high emission level if any in the atmosphere.
7. All process vent lines are connected with scrubbers which are provided with Chilled water condensers to avoid emission to atmosphere
8. All Critical process Vapour emissions are scrubbed by Venturi scrubbers and scrubbed materials are converted into By-product.
9. Acidic / Alkali Vapors are controlled by Fugitive emission Scrubber. The same fugitive emission is connected with all reactors / storage tank and process receiving tank.

M/s. Aurobindo Pharma

1. Metering and control of quantity of active ingredients to minimize waste.

2. Use of automated filling to minimize spillages.
3. Use of closed feed system into batch reactor and venting equipments also connected to vapour recovery system installed as the direction issued by the Board.
4. The unit has provided process scrubber using caustic lye solution and efficiency of this scrubber is 99 %.
5. The unit has provided vent line condenser & vapour recovery system.
6. All Venting equipments are connected to vapour recovery systems.
7. All distillation reactors connected through primary and secondary condensers.
8. All centrifuges vents are connected to condensers through blower.
9. All reactors connected with caustic scrubber.

M/s. GSR Products Limited.

1. All the reactors are provided with double mechanical seals.
2. All the reactors are provided with secondary condensers, for which chilled water is the cooling media.
3. All the reactors / condensers are connected to a common header and it is diverted to wet scrubber.
4. All the solvent pumps are provided with mechanical seals.

➤ **Action plan to control high NOx and SPM from M/s. Loyal Super Fabrics (Textile Dyeing unit) to be incorporated.**

The unit M/s. Loyal Super Fabrics has installed two Boilers 3 T/Hr & 4 T/Hr provided with dust collector and wet bottom scrubber and Thermic Fluid heaters 20 Lac. KCal/Hr and 30 Lac KCal/Hr are provided with a common stack of 25 m height. The Stack Monitoring Survey report reveals that the pollutant parameters are within the limits prescribed by the Board.

3.6.4 Need for infrastructure renovation

3.6.4.1 Development of roads

- SIPCOT existing service road to be repaired and maintained.

3.6.5 Impact on CEPI score after installation / commissioning of full fledged air pollution control system

A1	A2	A	B1	B2	B3	B	C1	C2	C3	C	D	Air CEPI
3	5	15	2	3	0	5	3	1	5	8	0	28

3.6.6 Self monitoring system in Industries (Stacks & APCDs)

- High volume samplers are installed by major units to monitor ambient air quality.
- TVOC monitors are provided by the following units in the ambient air.

S.No	Industries	TVOC sensors
1	Asian Paints	1 No
2	Clariant Chemicals	1 No
3	G.S.R Products	1 No
4	SPIC Ltd(Pharma)	2 Nos
5	Tagros Chemicals	1 No
6	Shasun Chemicals	3 Nos
7	Aurobindo Pharma	1 No

The details on the on-line stack monitors provided by the units is listed below.

Industries	Source of Emission	On-Line stack Monitors
Clariant Chemicals	Chlorine scrubber stack	Chlorine

TANFAC Industries	AlF ₃ plant Central Absorption system stack	Hydrogen Fluoride
	HF plant plant Central Absorption system stack	Hydrogen Fluoride
	SAP Final Absorption Tower stack	SO ₂
	Boiler stack – 10 TPH	SPM & SO ₂
Asian Paints	Boiler Stack – 16 TPH	SPM, SO ₂ , NO _x & CO
Pandian Chemicals	Electrolytic Cell scrubber stack	Chlorine
Chemplast Sanmar Ltd.	Boiler stack – 38 TPH	SPM, SO ₂ & NO _x
	PVC Drier stack	SPM & VCM
	VGA stack	VCM
	Emergency Vent	VCM

➤ **Monitoring of VCM (air pollutant) emitted by M/s. Chemplast Sanmar Limited (PVC Plant).**

The unit of M/s. Chemplast Sanmar Limited, (PVC Plant) has installed online VCM monitoring facility in the following process stack / ambient location.

- 1) VCM monitors in ambient air at 10 locations
- 2) VCM monitors in PVC Dryer stack.
- 3) VCM monitor in VGA stack.
- 4) VCM monitoring in near by villages through mobile GC.

The above monitoring is carried out on continuous basis. The unit is conducting leak detection and repair programme as per ECVEM charter through competent agency. The unit is conducting VOC and SVOC study as per EPA standards through MoEF/NABL approved lab once in three months.

The unit of M/s. Chemplast Sanmar Limited, (PVC Plant) monitors VCM in and around SIPCOT area during unloading of VCM raw material from ship to site storage tank by using Mobile GC van.

The unit of M/s. Chemplast Sanmar Limited, (PVC Plant) monitors VCM in the work place on continuous basis using GC.

TNPC Board monitors VCM along the stretch of VCM pipeline at Emergency shut down valve, at land fall point, at Port control building, T-joint near River Uppanar and Emergency shut down valve near VCM storage tank during unloading of VCM.

The VCM Monitoring done by the Board during unloading of VCM is below detectable limit.

3.6.7 Data Linkages to SPCB/CPCB (of monitoring devices)

The following industries have linked their on line monitoring system with Head office, Chennai

Sl. No	Industries	Sensors connected
1	Clariant Chemicals	1. TVOC monitor – ambient 2. Chlorine monitor- Chloronil plant stack 3. EMFM & pH of effluent discharge into sea.
2	G.S.R Products	1. TVOC monitor – ambient 2. EMFM & pH of sewage discharge into CUSECS
3	Aurobindo Pharma	1. TVOC monitor – ambient 2. EMFM & pH of effluent discharge into CUSECS
4	Pandian Chemicals	1. Chlorine monitor – Electrolytic cell stack 2. EMFM & pH of effluent discharge into CUSECS
5	Loyal Super Fabrics	EMFM & pH of effluent discharge into CUSECS

6	Pioneer Jellice India Ltd	EMFM , pH , temperature of effluent discharge into CUSECS.
7	Arkema Peroxide	EMFM & pH of effluent discharge into CUSECS.
8	Bayer Material Science	EMFM & pH of effluent discharge into CUSECS
9	Asian Paints	1. TVOC monitor – ambient 2. SPM, SO ₂ , NO _x & CO monitor – 16 TPH Boiler stack 3. RO permeate EMFM & pH. 4. Sensor for SO ₂ monitor has been installed
10	SPIC Ltd (Pharma)	Not in operation
11	Tagros Chemicals	1. TVOC monitor – ambient 2. EMFM & pH of sewage discharge line.
12	Shasun Chemicals	1. TVOC monitors (3 Nos) – Ambient /fugitive. 2. RO permeate EMFM & pH.
13	Chemplast PVC Plant	1. VCM monitors (2 Nos) – Fugitive/ambient 2. SPM, VCM monitors - PVC Dryer stack 3. SPM, SO ₂ , NO _x - 38 TPH Boiler stack 4. EMFM of sewage discharge line. 5. VCM monitors (8 Nos) – Fugitive/ambient 6. VCM monitor – VGA stack 7. pH of sewage discharge line. 8. RO permeate EMFM & pH of effluent. 9. Desalination plant reject discharge EMFM & pH into sea. 10. Mobile GC for VCM.
14	TANFAC Industries	i. HF monitors (2 Nos) – ii. HF plant CAS stack iii. AlF ₃ plant CAS stack & iv. EMFM of effluent discharge into CUSECS.
15	CUSECS Limited	EMFM, pH of effluent discharge from Sump V1 to Sea.

LAND ENVIRONMENT

4. LAND ENVIRONMENT

The following analysis report is enclosed in Annexure-III

Soil analysis report as carried out in SIPCOT area through NGRI , Hyderabad	Jan'2008	
Ground water ROA in SIPCOT area	January'2009 to Dec'2009	January'2010 to June'2010

4.1 **Soil contamination**

NGRI, Hyderabad has conducted Hydrogeological, Geophysical & Geochemical studies to understand the micro level ground water quality and sub surface conditions in and around SIPCOT area. Soil samples were collected at different location and the report is enclosed in annexure-III.

It was informed that the concentration of Total Chromium, lead & arsenic was found higher in sample S7 collected from Tantech. The concentration of Hexavalent Chromium, Sulphate & Chloride were found higher in sample S22, S15 & S10. Cadmium & Mercury concentration were found higher in S14 & S32

In the report, It was informed that the influence of River Uppanar which is with in 50 m from eight industries plays a significant role in contributing to the sub surface pollution. Prior to the formation of CUSECS all the industries were discharging the treated effluent into Uppanar. Hence Uppanar has historical pollution and with time and heavy pumping in the western side the hydraulic gradient is more towards the western side and hence the chance of river water entering in land is very high.

4.2 **Ground water contamination**

4.2.1 **Present status /quality of ground water**

The ground water in SIPCOT area is monitored at three locations namely i) SPIC Bore well located within the premises of M/s. SPIC Ltd.,) ii) Kudikadu OHT –the bore well is located out side SIPCOT boundary in the western direction (opp to M/s. Clariant Chemicals) & iii) Sathya Hand pump located opposite to M/s. J.K Pharma presently closed.

pH, Fluoride, Sulphide, Phenolic compounds, cyanide, Lead, Zinc, Cadmium are within the limits of Drinking water standards. Calcium, Magnesium and Total Iron exceeds the drinking water standards.

4.2.2 Source Identification (Existing source of ground water pollution)

There is no industrial discharge of treated trade effluent on land in the SIPCOT area. However during heavy rains, possibility of carry over of chemical contamination along with storm water run off from industrial premises exists.

4.2.3 Ground water quality monitoring programme

The ground water in SIPCOT area is monitored at three locations namely i) SPIC Bore well located within the premises of M/s. SPIC Ltd.,) ii) Kudikadu OHT –the bore well is located out side SIPCOT boundary in the western direction (opp to M/s. Clariant Chemicals) & iii) Sathya Hand pump located opposite to M/s. J.K Pharma

4.2.4 Action plan for control of pollution including cost / time aspect

There is no specific ground water contamination in the SIPCOT area. adequate storm water drains to be provided within SIPCOT area and existing storm water drains within SIPCOT area to be renovated & desilted by SIPCOT authorities.

4.2.5 Treatment and management of contaminated ground water bodies, etc.

Nil

4.2.6 Impact on CEPI score after abatement of pollution.

A1	A2	A	B1	B2	B3	B	C1	C2	C3	C	D	Land CEPI
3	5	15	2	3	3	8	3	1.5	5	9.5	0	33.5

4.3 Solid waste generation and Management

4.3.1 Waste Classification and quantification

4.3.1.1 Hazardous waste

The hazardous waste generated during the year 2009-10, disposed during the year 2009-10 and accumulated as on 31.03.10 is tabulated below

Type of waste	Generated in Tons 2009-10	Disposed in Tons 2009-10	Accumulated in Tons as 31.03.10
Lanfillable	987.174	3004.603	5538.376
Incinerable	425.752	9.5	742.169
Recyclable	4277.0928	4076.883	2282.1105

4.3.2 Identification of waste minimization and waste exchange process.

Industry	Waste minimization / waste exchange process adopted	objective
1. TANFAC industries	The sulphuric acid used to remove the moisture in the HF gas earlier sent to ETP is presently reused back for the scrubbing process	Sulphate effluent load to ETP is reduced.
2. Tagros Chemicals	Recovery of weak HCl and Sodium sulphite solution from process emission.	Reused
	Recover of Bromine from Hydrogen bromine solution generated from the Deltamethrin plant	Reused
3. SPIC Ltd	High COD effluent is segregated and evaporated	COD load is reduced in the effluent for treatment
	Accumulated mycellia sludge sent for boiler fuel and as agriculture manure	Mycellia odour is removed

4. Clariant Chemicals	Recover of weak HCl from process emission scrubbing	Reused
	Sodium hypochlorite is recovered as a bye product from chlorine absorption scrubber.	Reused
	Filter press is provided in the pigment Blue plant to collect carry over of product along with the Effluent.	Blue color in the effluent is totally removed.
5. Victory Chemicals	Accumulated Barite mud sludge	Study conducted to be used in the process of cement manufacture.

4.3.3 Reduction / Recovery / Reuse / Recycle in the Co- processing of waste

Industry	Hazardous Waste	Reuse/ Recycle process adopted
1. TANFAC industries	Lime sludge from waste water treatment	Sold to cement factories to utilize in the cement manufacture
2. Clariant Chemicals	ETP sludge	Sold to cement factories to utilize in the cement manufacture
3. Victory Chemicals	Accumulated Barite mud sludge	Study conducted to be used in the process of cement manufacture.
4. Industry generating incinerable waste	Incinerable waste (process / distillation residue)	Identified to be utilized in the cement kiln for co-incineration.

- **Status of Closed industries pertaining w.r.t. Hazardous Waste, Raw materials, Semi processed materials, process waste, etc., lying within their premises.**

The status of closed industries with respect of Hazardous Waste, Raw materials, Semi processed, process waste etc., lying within the premises.

Sl. No	Name and address of the unit	Details on the left out materials noticed	Method of storage	Status of the unit
01	M/s. DSQ Beverages, C-18, SIPCOT Industrial Complex, Cuddalore – 5.	Ethyl Alcohol about 80 KL	Stored in a closed shed with lock & key under the control of excise Tahsildhar	Under the possession of IDBI, Mumbai. Managing Director SIPCOT to expedite necessary action for the disposal of the same.
02	M/s. J.K.Pharma Chem Limited, Plot.No.A-7, A-10, A-12 & A-15, SIPCOT Industrial Complex, Cuddalore – 5.	The sludge of 12 T removed from the cleaning of ETP is being collected in HDPE bags.	Collected in HDPE bags and stored in the ETP area under covered shed.	M/s.Vardhaman Life Science (P) Limited (earlier in the name of M/s. J.K.Pharma Chem Limited) has been addressed to apply & obtain authorization of the Board for disposal of waste to TSDF.

03	M/s.Pentafour Products Limited, (Phosphoric Division), A-3/1, SIPCOT Industrial Complex, Cuddalore – 5.	Phosphoric acid – 10KL. Sulphur – 100 Kg Surfactants – 2 tons.	Stored in closed carboys. Stored in open platform. Stored in closed carboys.	Official liquidator Hon'ble High Court, Mumbai. Managing Director SIPCOT to expedite necessary action for the disposal of the same.
04	M/s. Maruthi Laboratories (P)Ltd, B-1, SIPCOT Industrial Complex, Cuddalore – 5.	Micro Crystalline Cellulose powder – 750 Kg. (Non-haz)	Stored in HDPE bags inside covered shed.	Under the possession of Tamilnadu Industrial Investment Corporation.
05	M/s. Tantech Agro Chemicals Limited, Plot No.B-11/2, B-13 SIPCOT Industrial Complex, Cuddalore - 5.	1. Acetyl chloride 2. HCl. 3. TriChloroethylene 4. Furnace oil, 5. Iso Butyl acetophenone 6. ETP sludge-120 Tons	Stored in closed barrels. Stored in closed tank. Stored in closed tank. Stored in closed tank. Stored in closed barrels. Collected in HDPE bags & stored in the Premises.	The Unit has been addressed to dispose ETP sludge to TSDF.

4.3.4 Infrastructural facilities

4.3.4.1 Existing TSDF/incineration facility including capacity

- No incineration and Secured Land fill facility available in the SIPCOT area.
- The TSDF maintained by the Tamilnadu Waste Management Ltd at Gummidipoondi is being utilized for disposal of Land fillable facility.

4.3.4.2 Impact on CEPI score after proper management of solid waste.

A1	A2	A	B1	B2	B3	B	C1	C2	C3	C	D	Land CEPI
3	5	15	2	3	3	8	3	1.5	5	9.5	0	33.5

5. PPP Model

5.1 Identification of project proposal for implementation under the PPP mode under Action Plan

- Industries to improve pollution control equipment / device to satisfy the standards prescribed by the Board.
- The units to provide real time data to link with CARE AIR CENTRE at Board office.
- Board proposed to provide Continuous AAQ stations at Kudikadu & Pachankuppam Villages.
- Adequate storm water drains to be provided within SIPCOT area.
- Existing storm water drains within SIPCOT area to be renovated & desilted by SIPCOT authorities.
- The study conducted by industries engaging educational institutions, Research development & Government agencies to identify specific problem and to mitigate the problem is tabulated below.

Industries	Details of study conducted for improvement	Study conducted by	Year of study	Remarks
Pioneer Jellice India Ltd.,	Utilisation of bone sludge as a valuable manure for field crops-	Dept. of Agronomy, Faculty of Agriculture, Annamalai University	2004	Provides macro & micro nutrient and soil ameliorative properties.
Chemplast Sanmar Ltd	VCM conveyance pipeline safety.	Cell for Industrial safety and Risk analysis (CISRA), CLRI	June' 2009	Audit report of CISRA reveals that the pipeline safety is as per their recommendation.

Asian Paints Ltd.,	<ul style="list-style-type: none"> Environmental Audit on Pollution Load due to increase in production capacity of Penta Erythritol from 350 MT/month to 450 MT/month. Alternate route to produce Penta Erythritol by change of alternate environmental friendly raw material. 	CLRI (CSIR), Chennai India soft Technologies (P) Ltd.,	2007 2009	No alternate methodologies without using Acetaldehyde & Formaldehyde as raw materials.
Tagrose	Environmental & Waste audit	CES, Anna University.	2009	To identify gaps in the Environmental Management practice and to provide expert opinion on waste management and control measures. To upgrade old equipment / plant in a phased manner.
SPIC Ltd.,	<ul style="list-style-type: none"> Study on providing Double drum drier for drying mycelia & MEE for treatment of high COD effluent. Utilisation of penisillium Bio Mass (Mycelia) 	R&D Consultancy Centre, Dept of Civil Engineering, Pondicherry Engineering College, Pondy. Tamilnadu Agricultural University, Department of	2008 1998	To reduce mycelia odour and to reduce COD load in the effluent for treatment. Can be utilized for Chitin extraction Can be used as soil

	for other beneficial use.	Environmental Sciences, Coimbatore		ameliorant to offset some effects of chromium pollution. Can be used as fertilizer to grow brinjal and black gram as it contains 1.26% N , 0.52 % phosphorous & 1.1 % potassium
CUSECS	Marine Impact Study to assess the status of pollution due to disposal of treated trade effluent into sea	Institute of Ocean Management, Anna University, Chennai	2008	It was concluded that the waters are less polluted and provide the necessary environmental condition for the marine life to flourish.
CSIA	Micro Level Ground Water Quality / Ground Water Movement in Cuddalore SIPCOT	National Geophysical Research Institute (CSIR), Hyderabad	2008	Kudikadu village shows the sub surface is free from anthropogenic pollution. The report also concludes that Uppanar river and the water table in the western table in the western side of SIPCOT are almost the same. Hence there can be intrusion of the Uppanar river water in the dynamic conditions.
CSIA	VOC study in and around SIPCOT area	NEERI, Nagpur	2006	Short term & Long term recommendations suggested to reduce VOC emission.

6. Other infra structural renewal measures

6.1 Green Belts

Sl. No	Name of the industry	Type of saplings	Numbers	
			Present status	Future Plan
1	Arkema Peroxides India Private Limited	Coconut	2750	1000 Nos of casuarina trees in the year 2011.
		Eculyptus	200	
		Casuarinas	200	
		Flame of forest	150	
		Fycus Benjamina, Neem	70	
		Palm trees	100	
		Teak	100	
2	Asian Paints Limited	Neem, Pungam	7260	1000/Year
3	Bayer Material Science	Casuarinas, Neem, Pungam	600	300
4	GSR Products Limited	Neem, Pungam	151	70/year
5	Tagros Chemicals Private Limited	Neem, Pungam	690	100
6	Clariant Chemicals (India) Limited	Pungan	800	
7	SPIC Ltd (Pharma)	Neem, Pungam	1330	500
8	Pioneer Jellice India Ltd	Pungam, Neem	1900	200
9	Shasun Chemicals	Neem, Padam, Rubber, Coconut, Ashoga, Ficus, Mango, Amia, Teack others (Flowering trees, Casuriena, Savundal)	1160	100
10	TANFAC Industries Limited	Casurino	14750	250/Year
		Equaliptos	23400	
		Others	1010	
11	Loyal Super Fabrics	Neem, Pungam	500	
12	Aurobindo	Neem, Pungam	635	150/Year
13	SIPCOT Phase - I & II	Fycus Benjamina, Neem,	10000	-

11	Loyal Super Fabrics	Neem, Pungam	500	
12	Aurobindo	Neem, Pungam	635	150/Year
13	SIPCOT Phase - I & II	Fycus Benjamina, Neem,	10000	-

6.2 Development of industrial Estate

- Adequate storm water drains to be provided within SIPCOT area.
- Existing storm water drains within SIPCOT area to be renovated & desilted by SIPCOT authorities.
- Providing Fire Hydrant network in SIPCOT area.
- SIPCOT service roads to be repaired and maintained.

7 Specific schemes

7.1 Co-processing of wastes in cement industries

- The ETP sludge (Lime sludge) is utilized in cement industries
- Studies conducted to utilize Barite sludge to be utilized in cement units
- Encouraging Incinerable waste (process / distillation residues) to be utilized in cement kiln for co-incineration.

8. Public awareness and training programmes

Awareness programme on not to use 'Use & Throw Plastics' in SIPCOT area.	School students, panchayat presidents, NGO's & SIPCOT Industries	11.08.2010
Awareness programme on developing green belt in SIPCOT area.	District administration, NGO's, & SIPCOT industries	22.07.2010 & 06.08.2010.
Training programme on Co-Incineration on incinerable solid waste.	Industries	05.08.2010

9. Detailed health impact study should be carried out through a reputed agency.

Cuddalore SIPCOT Industries Association (CSIA) has been addressed to conduct detailed Health Impact Study through reputed agency. It is informed that CSIA has already initiated and contacted NIOH & Public Health Foundation of India for conducting health study. Study will be taken up early.

10. Overall Impact after installation / commissioning of pollution control equipments / measures on the CEPI score

CEPI has been evaluated for the same critical pollutants considered by CPCB and as per the standard guidelines mentioned in the CPCB documents.

No	Industrial Area/clusters	Air	Water	Land	CEPI
16	SIPCOT Phase I & II Cuddalore (Tamilnadu)	28.00	50.00	33.5	54.69

11. Assessment of Techno – economical feasibility of pollution control system in clusters of small / medium scale industries.

S. No	Industry	Category	Trade effluent	ETP	Air emission	Pollution control measures
1	Tagros Chemicals (unit-II)	R/S	15	ZLDS	1. Reactor vent 2. Sodium sulphite storage tank vent	Scrubber Scrubber
2	Tagros Chemicals (unit-III)	R/S	Nil	N/A	Nil	N/A
3	Kumar Chemical	R/S	Nil	N/A	Nil	N/A
4	MAB Metals	R/S	0.05	SEP	Annealing furnace	Scrubber

5	TamilNadu Pigments	R/S	12	ETP	Nil	N/A
6	Pondichery Alum	R/S	Nil	N/A	Nil	N/A
7	Diamond Ice	O/S	Nil	N/A	Nil	N/A
8	Kousalya Ice	O/S	Nil	N/A	Nil	N/A
9	Igloo Ice	O/S	Nil	N/A	Nil	N/A
10	Morgan Propack	O/S	Nil	N/A	Nil	N/A
11	Coastal Packers	G/S	Nil	N/A	Nil	N/A

12. Summary of proposed action points

12.1 Short Term Action Points (upto 1 year , including continuous activities)

S. No	Action points (including source & mitigation measures)	Responsible stake holders	Time limit	Cost In lakhs	Remarks
1	Trade effluent <ul style="list-style-type: none"> To reduce BOD, COD & Sulphides To provide Chlorination treatment 	Loyal Super Fabrics	completed	23.5	Chlorination techniques used
2	Trade effluent <ul style="list-style-type: none"> To remove TSS. To provide filter system 	Arkema Peroxides	completed	1.5	The values are within limits for the sample collected during 2010 -11
3	Trade effluent <ul style="list-style-type: none"> To remove TSS. To provide filter system 	Pandian Chemicals	completed	2	The values are within limits for the sample collected during 2010 -11
4	Air emission <ul style="list-style-type: none"> To reduce HF To provide Dry scrubbing system 	TANFAC Ltd	completed	35	-
5	Air emission	Victory	3 months	10	Work to be

	<ul style="list-style-type: none"> To reduce SO₂ Fuel conversion from F.O to Bio fuel 	chemicals			started
6	Air emission <ul style="list-style-type: none"> To reduce SO₂ Fuel conversion from F.O to Bio fuel 	Clariant Chemicals	Dec 2010	15	Completed.
7	Air emission <ul style="list-style-type: none"> To reduce mycelia odour. To provide Double drum dryer 	SPIC Ltd	completed	100	Presently the unit is not in operation
8	Air emission <ul style="list-style-type: none"> To reduce animal bone odour. To provide incineration through boiler. 	Pioneer Jellice	completed	1.5	Provided
9	Air emission <ul style="list-style-type: none"> To reduce VOC emission To connect all storage tanks vents for reuse 	Asian Paints	completed	2.39	Complied
10	Air emission – To reduce VOC emission <ul style="list-style-type: none"> Stabilisation of Waste 	Shasun chemicals	Stabilisation being carried out.	100	600 tons of waste stabilised
	<ul style="list-style-type: none"> Bio- Filter modification. 		completed	50	improved
	<ul style="list-style-type: none"> Aeration tank to be covered 		completed	50	improved
	<ul style="list-style-type: none"> Reduction of VOC like Chloroform 		Study under progress	100	-
	<ul style="list-style-type: none"> Process modification by changing raw materials. 		Study under progress.	300	-
11	Air emission <ul style="list-style-type: none"> To reduce VOC emission Solvent Recovery System proposed 	Tagros chemical	completed	145	To be monitored

12	<ul style="list-style-type: none"> To connect real time on-Line monitoring (provided/existing sensor) data to Care Air Center 	Industries	30.08.10	40	Completed.
13	<ul style="list-style-type: none"> De-silting of existing storm water drain 	SIPCOT	15.09.2010	1	Work in progress
14	<ul style="list-style-type: none"> Providing weather monitoring stations 	SIPCOT	30.09.2010	1.25	-

12.2 Long Term Action Points (more than 1 year)

S. No	Action points (including source & mitigation measures)	Responsible stake holders	Time limit	Cost in Lakhs	Remarks
1	Trade effluent- To reduce TSS, BOD, COD, TSS, TKN, Ammoniacal Nitrogen & Sulphides. To provide UASBR, Nitrification & De-Nitrification Reactor	Pioneer Jellice	January 2011	200	Work in progress
2	CAAQMS at Kudikadu & Pachayankuppam village	TNPCB	Dec 2011	240	-
3	Strengthening of DEL/upgradation of monitoring facilities 1). G.C / M.S. – 1 No. 2). VOC samplers – 6 Nos. Strengthening staffs to monitor & maintain the AAQ stations Requirement 1).Deputy Manager -1. 2).Env.Scientist – 3 3).Field Asst. – 3 4).Admn. Staff -1 (Category GA) 5).Office Asst - 1	TNPCB	Dec 2011	176	-

4	Renovation of storm water drains in SIPCOT area by using cement concrete wall on either side and covered with RCC	SIPCOT	3 years	478	To be started
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CONCLUSION.

Taking into consideration of the above facts & figures and also based on the action taken by the industries, the CEPI works out to 54.69 for the SIPCOT Phase I & II Industrial Cluster, Cuddalore.

In view of the above, SIPCOT Phase I & II, Industrial Cluster, Cuddalore may be de-notified from the list of Critically Polluted Area.

ANNEXURES

UPPANAR RIVER (UP STREAM)
STATEMENT OF REPORT OF ANALYSIS for the year 2009

Sl. No	Parameters	28.01.09	25.02.09	17.06.09	30.07.09	26.08.09	23.09.09	27.10.09	25.11.09	14.12.2009	Range
1	pH	8.78	8.11	8.13	7.23	7.24	7.14	6.99	6.73	7.09	6.73 - 8.78
2	BOD	16	2	4	12	3	2	4	4	2	2 - 16
3	COD	80	157	80	160	76	80	81	30	16	16 - 160
4	TSS	16	316	84	68	84	1440	3628	12	28	12 - 3628
5	TDS	7324	12012	32216	40124	32532	41504	24800	500	560	500 - 41504
6	Chlorides	2374	5798	17395	17395	17844	18744	16595	114	146	114 - 18744
7	Sulphates	488	770	1566	2165	3350	1570	1640	100	75	75 - 3350
8	Oil and Grease	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	2	<MDL - 2
9	Fluorides	1	0.65	1.62	1.4	1.55	1.35	0.16	1	0.75	0.16 - 1.55
10	Lead	0.04	<MDL	0.01	0.045	0.3	0.1	0.2	0.11	<MDL	<MDL - 0.01
11	Zinc	<MDL	0.005	<MDL	0.031	0.03	0.06	0.03	<MDL	0.05	<MDL - 0.06
12	Copper	0.004	0.001	0.7	<MDL	0.01	0.04	0.02	0.001	0.01	<MDL - 0.7
13	Ammoniacal Nitrogen	2.8	<MDL	<MDL	1.1	1.1	1.4	0.6	<MDL	<MDL	<MDL - 2.8
14	TRC	<MDL	<MDL	1.77	<MDL	1.8	1	0.88	<MDL	<MDL	<MDL - 1.8
15	TKN	4.2	<MDL	<MDL	1.4	1.4	2	0.8	<MDL	<MDL	<MDL - 4.8
16	Hex. Chromium	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
17	Total Chromium	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
18	Cyanides	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
19	Sulphides	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
20	Cadmium	<MDL	<MDL	<MDL	<MDL	0.01	0.02	0.02	0.009	<MDL	<MDL - 0.02
21	Nickel	<MDL	<MDL	0.1	<MDL	0.03	0.002	0.02	<MDL	<MDL	<MDL - 0.1

All the unit except pH expressed in mg/L.

UPPANAR RIVER (UP STREAM)
STATEMENT OF REPORT OF ANALYSIS for the year 2010

Sl. No	Parameters	25.01.10	22.02.10	20.03.10	23.04.10	26.05.10	15.06.10	09.07.10	Range
1	pH	7.32	6.99	7.12	6.85	7.64	7.33	7.03	6.85 - 7.64
2	BOD	4	4	2.7	3	5	4	4	2.7 - 5
3	COD	39	40	80	79	75	58	107	30 - 107
4	TSS	84	228	776	1872	468	556	872	84 - 1872
5	TDS	732	4020	16988	43968	29460	17432	31784	732 - 43968
6	Chlorides	175	1849	6020	19594	3999	8997	15300	175 - 19594
7	Sulphates	115	39	277	1194	1002	848	1210	39 - 1210
8	Oil and Grease	2.8	1	1	1	1	1	1	1 - 2.8
9	Fluorides	0.75	0.6	0.8	0.9	1.45	1.3	<MDL	<MDL - 1.45
10	Lead	<MDL	<MDL	0.3	0.23	0.25	<MDL	0.002	<MDL - 0.3
11	Zinc	<MDL	0.3	0.2	0.05	<MDL	<MDL	0.051	<MDL - 0.3
12	Copper	<MDL	<MDL	0.02	0.03	<MDL	0.005	0.0702	<MDL - 0.03
13	Ammoniacal Nitrogen	<MDL	<MDL	4.2	<MDL	<MDL	<MDL	<MDL	<MDL - 4.2
14	TRC	<MDL	-	<MDL	-	<MDL	-	<MDL	<MDL -
15	TKN	<MDL	<MDL	9.8	<MDL	<MDL	<MDL	<MDL	<MDL - 9.8
16	Hex. Chromium	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
17	Total Chromium	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
18	Cyanides	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
19	Sulphides	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL - 0.03
20	Cadmium	0.01	<MDL	0.03	<MDL	<MDL	<MDL	<MDL	<MDL - 0.4
21	Nickel	<MDL	<MDL	0.4	0.09	0.06	-	<MDL	<MDL - 0.4

All the unit except pH expressed in mg/L.

UPPANAR RIVER (DOWN STREAM)
STATEMENT OF REPORT OF ANALYSIS for the year 2009 :

Sl. No	Parameters	28.01.09	25.02.09	18.06.09	30.07.09	26.08.09	23.09.09	27.10.09	25.11.09	14.12.09	Range
1	pH	8.61	8.35	8.27	7.43	7.57	7.08	7.13	6.81	6.51	6.51 - 8.61
2	BOD	16	7	3	7	2	3	5	7	4	2 - 16
3	COD	80	158	80	80	76	80	81	59	24	24 - 158
4	TSS	16	500	88	80	72	376	2752	96	212	16 - 2752
5	TDS	17980	24064	38589	61312	23792	22140	31372	2120	3320	2120 - 61312
6	Chlorides	6598	10972	19544	19494	12945	11746	17744	840	1550	840 - 19544
7	Sulphates	944	1684	1934	2455	2235	1110	1850	170	98	98 - 2455
8	Oil and Grease	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	2	<MDL - 2
9	Fluorides	1.45	1.77	1.66	1.4	1.32	1.35	0.16	1	1	0.16 - 1.77
10	Lead	0.05	<MDL	<MDL	0.077	0.3	0.05	0.2	0.11	<MDL	<MDL - 0.3
11	Zinc	0.02	<MDL	<MDL	0.016	0.2	0.06	0.04	<MDL	0.04	<MDL - 0.2
12	Copper	0.02	0.02	<MDL	<MDL	0.2	0.06	0.03	0.01	0.01	<MDL - 0.2
13	Ammoniacal Nitrogen	4.2	<MDL	<MDL	0.8	0.8	0.6	1.4	<MDL	<MDL	<MDL - 4.2
14	TRC	<MDL	<MDL	<MDL	<MDL	<MDL	2.7	13.3	<MDL	<MDL	<MDL - 2.7
15	TKN	5.6	<MDL	<MDL	1.1	1.1	0.8	1.9	<MDL	<MDL	<MDL - 5.6
16	Hex. Chromium	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
17	Total Chromium	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
18	Cyanides	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
19	Sulphides	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
20	Cadmium	<MDL	<MDL	<MDL	<MDL	<MDL	0.068	0.02	<MDL	<MDL	<MDL - 0.02
21	Nickel	<MDL	<MDL	0.1	<MDL	<MDL	<MDL	0.04	<MDL	<MDL	<MDL - 0.1

All the unit except pH expressed in mg/L.

**UPPANAR RIVER (DOWN STREAM)
STATEMENT OF REPORT OF ANALYSIS for the year 2010**

Sl. No	Parameters	25.01.10	22.02.10	20.03.10	23.04.10	26.05.10	15.06.10	09.07.10	Range
1	pH	7.34	6.72	6.77	6.85	7.46	7.45	7.04	6.72 - 7.46
2	BOD	23	3	3.3	3	4	2	2	2 - 23
3	COD	82	80	80	79	150	65	174	65 - 174
4	TSS	1652	948	1264	1872	636	1616	1304	636 - 1872
5	TDS	12660	18752	34184	43968	44540	58216	59824	12660 - 59824
6	Chlorides	7298	8497	18900	19594	4490	22193	23800	4490 - 23800
7	Sulphates	362	95	1060	1194	1201	1190	1527	95 - 1527
8	Oil and Grease	2	1	1	1	1	1	1	1 - 2
9	Fluorides	0.65	1.1	1.15	0.9	1.35	1.65	1.6	0.65 - 1.65
10	Lead	<MDL	<MDL	0.4	0.23	0.34	0.05	<MDL	<MDL - 0.4
11	Zinc	0.008	0.03	0.1	0.05	<MDL	<MDL	0.145	<MDL - 0.145
12	Copper	<MDL	0.02	0.05	0.03	0.03	0.04	0.0709	<MDL - 0.0709
13	Ammoniacal Nitrogen	<MDL	<MDL	2.8	<MDL	<MDL	<MDL	<MDL	<MDL - 2.8
14	TRC	<MDL	*	<MDL	*	<MDL	*	<MDL	<MDL
15	TKN	<MDL	<MDL	8.4	<MDL	<MDL	<MDL	<MDL	<MDL - 8.4
16	Hex. Chromium	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
17	Total Chromium	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
18	Cyanides	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
19	Sulphides	<MDL	<MDL	<MDL	2.4	<MDL	<MDL	<MDL	<MDL - 2.4
20	Cadmium	0.02	<MDL	0.04	<MDL	0.008	<MDL	<MDL	<MDL - 0.04
21	Nickel	<MDL	0.02	0.5	0.09	0.14	*	<MDL	<MDL - 0.5

All the unit except pH expressed in mg/L.

MARINE OUTFALL - CUSECS

Sl. No	Parameters	Tolerance Limit	30.01.09		21.04.09		17.08.09		04.02.10		26.05.10	
			Reference	Surface	Reference	Surface	Reference	Surface	Reference	Surface	Reference	Surface
1	pH	5.5 - 9.0	8.56	8.62	8.18	8.16	7.57	7.28	7.04	7.57	6.52	6.99
2	BOD Demand	100	4	2	2	2	3	3	2	3	4	3
3	COD	250	80	160	80	153	160	160	76	227	75	75
4	TSS	100	1040	1096	76	72	1556	1436	1740	<MDL	548	604
5	Sulphates	1000	1850	2340	2770	2490	2100	2180	1886	<MDL	1508	1111
6	Oil and Grease	20	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	2	<MDL	1	1
7	Copper	3.0	0.05	0.05	0.05	0.06	<MDL	0.01	0.02	0.01	0.05	0.048
8	Fluoride	15	1.6	1.6	1.7	1.58	1.4	1.5	1.5	1.15	1.45	1.5
9	Cyanides	0.2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
10	Lead	1.0	0.2	0.2	0.3	0.3	0.03	0.06	0.1	0.1	0.35	0.35
11	Zinc	1.5	0.1	0.04	0.1	0.3	1	0.3	<MDL	<MDL	0.07	0.06
12	Total Chromium	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
13	Ammoniacal Nitrogen	50	<MDL	<MDL	4.2	2.8	0.8	0.8	<MDL	<MDL	<MDL	<MDL
14	Sulphides	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
15	TKN	100	<MDL	<MDL	5.6	4.2	1.1	1.1	<MDL	<MDL	<MDL	<MDL
16	Cadmium	2.0	0.02	0.01	0.01	<MDL	<MDL	<MDL	0.04	0.04	0.024	0.018
17	Nickel	3	0.1	0.06	<MDL	<MDL	<MDL	<MDL	0.04	<MDL	0.18	0.17
18	Phe. Compounds	5.0	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
19	Dissolved Oxygen	-	6.7	7.3	6.6	4	6.9	6.9	5.8	6.3	6.5	6.3
20	Dissolved Phosphates	-	<MDL	<MDL	<MDL	0.04	<MDL	0.03	<MDL	<MDL	<MDL	<MDL

MARINE OUTFALL - Clariant Chemicals

Sl. No	Parameters	Tolerance Limit	30.01.09		17.08.09		04.02.10		26.05.10	
			Reference	Surface	Reference	Surface	Reference	Surface	Reference	Surface
1	pH	5.5 - 9.0	8.56	7.1	7.57	8.67	7.04	7.45	6.52	7.5
2	BOD Demand	100	4	3	3	2	2	3	4	2
3	COD	250	80	160	160	80	76	151	75	75
4	TSS	100	1040	1504	1556	1012	1740	1760	548	596
5	Sulphates	1000	1850	2400	2100	2840	1886	1638	1508	1300
6	Oil and Grease	20	<MDL	<MDL	<MDL	<MDL	2	2.4	1	1
7	Copper	3.0	0.05	0.3	<MDL	0.06	0.02	0.02	0.05	0.04
8	Fluoride	15	1.6	1.4	1.4	1.4	1.5	1.4	1.45	1.62
9	Cyanides	0.2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
10	Lead	1.0	0.2	0.07	0.03	0.2	0.1	0.2	0.35	0.36
11	Zinc	1.5	0.1	0.4	1	0.04	<MDL	<MDL	0.07	0.1
12	Total Chromium	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
13	Ammoniacal Nitrogen	50	<MDL	0.8	0.8	<MDL	<MDL	<MDL	<MDL	<MDL
14	Sulphides	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
15	TKN	100	<MDL	1.1	1.1	<MDL	<MDL	<MDL	<MDL	<MDL
16	Cadmium	2.0	0.02	<MDL	<MDL	0.01	0.04	0.05	0.024	0.008
17	Nickel	3	0.1	<MDL	<MDL	0.09	0.04	0.02	0.18	0.16
18	Phe. Compounds	5.0	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
19	Dissolved Oxygen	-	6.7	7.2	6.9	6.6	5.8	6.2	6.5	3.7
20	Dissolved Phosphates	-	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL

MARINE OUTFALL - CHEMPLAST SANMAR

Sl. No	Parameters	Tolerance Limit	26.02.10		10.06.10	
			Reference sample	Surface	Reference sample	Surface
1	pH	5.5 - 9.0	7.18	7.32	7.27	7.64
2	BOD Demand	100	3	3	4	3
3	COD	250	152	171	76	76
4	TSS	100	1856	1848	1576	1412
5	Sulphates	1000	930	998	1373	1459
6	Oil and Grease	20	1	1	1	1
7	Copper	3.0	0.04	0.04	0.04	0.4
8	Fluoride	15	1.05	1.2	1.4	1.65
9	Cyanides	0.2	< MDL	< MDL	< MDL	< MDL
10	Lead	1.0	0.09	0.08	0.3	0.3
11	Zinc	1.5	0.04	0.06	< MDL	< MDL
12	Total Chromium	1	< MDL	< MDL	< MDL	< MDL
13	Ammoniacal Nitrogen	50	< MDL	< MDL	< MDL	< MDL
14	Sulphides	5	< MDL	< MDL	< MDL	< MDL
15	TKN	100	< MDL	< MDL	< MDL	< MDL
16	Cadmium	2.0	< MDL	< MDL	0.04	0.04
17	Nickel	3	0.04	0.06	0.1	0.1
18	Phe. Compounds	5.0	< MDL	< MDL	< MDL	< MDL
19	Dissolved Oxygen	-	6.8	6.3	6.4	6.2
20	Dissolved Phosphates	-	< MDL	< MDL	< MDL	< MDL

ROA of treated trade effluent let out into sea through CUSECS sump-VI														
S.No	Parameters	Tolerance Limit	07.08.09	17.08.09	26.08.09	10.09.09	23.09.09	13.10.09	27.10.09	02.11.09	10.11.09	20.11.09	01.12.09	Range
			6.03	6.71	6.38	7.31	6.63	6.42	6.61	6.63	6.5	6.41	6.03 - 7.31	
2	BOD	100	11	113	510	70	119	350	95.2	298	137	120	69	11 - 510
3	COD	250	56	481	992	380	288	456	317	776	400	296	524	56 - 992
4	TSS	100	184	423	568	188	168	516	288	256	506	380	80	80 - 568
5	TDS	-	3024	5952	7524	2544	4448	5608	1927	3668	5044	4685	2298	2308 - 7524
6	Chlorides	-	810	2609	3324	975	1974	2424	860	1749	2749	2074	1060	810 - 3324
7	Sulphates	1000	594	106	134	178	155	178	206	379	208	304	397	104 - 1278
8	Oil and Grease	20	<MDL	6	6	4	4	2	3	7	1	2.8	2.8	<MDL - 8
9	Copper	3	<MDL	<MDL	0.05	0.03	0.02	0.01	0.003	0.008	0.03	0.02	0.02	<MDL - 0.05
10	Fluoride	15	1.68	2.9	3.4	1.4	1.3	1.6	0.487	0.65	0.1	<MDL	0.75	<MDL - 3.4
11	Cyanides	0.2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
12	Lead	1	<MDL	<MDL	0.2	<MDL	0.1	0.05	<MDL	0.06	0.2	0.1	<MDL	<MDL - 0.2
13	Zinc	1.5	0.05	<MDL	0.1	0.06	0.07	0.03	0.03	0.03	0.13	0.3	0.06	<MDL - 0.3
14	Total Chromium	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
15	Ammonical Nitrogen	50	1.7	26	25	8.4	15	18	5	134	69	112	49	1.7 - 134
16	TRC	1	87	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL - 87
17	Sulphides	5	1.6	11	2	6.4	11.2	18	0.8	10.4	8	23.6	5.2	0.8 - 23.6
18	TKN	100	2.3	34	32	10.6	19	23	8	169	88	138	66	2.3 - 169
19	Hex.Chromium	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
20	Calcium	2	<MDL	<MDL	0.01	<MDL	<MDL	0.008	<MDL	<MDL	0.02	0.005	<MDL	<MDL - 0.02
21	Nicel	2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
22	Phos. Components	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
23	Dis. Phosphates	-	0.3	1.8	1.2	3.7	1.1	1.05	1.09	0.52	0.4	<MDL	0.9	<MDL - 3.7

ROA of treated trade effluent let out into sea through CUSECS sump-VI

S.No	Parameters	Tolerance Limit	ROA of treated trade effluent let out into sea through CUSECS sump-VI											Range
			04.01.10	11.01.10	22.01.10	25.01.10	04.02.10	12.02.10	18.02.10	22.02.10	08.03.10	20.03.10	31.03.10	
	pH	5.5-9	6.98	6.77	6.33	6.88	6.89	6.77	6.68	6.46	6.25	6.47	6.46	6.55 - 6.98
2	BOD	100	65	179	53	61	62	43	163	54	75	138	159	43 - 179
3	COD	250	331	1777	231	351	303	307	212	496	380	368	397	231 - 1777
4	TSS	100	212	3348	76	312	268	164	324	276	189	292	384	76 - 3348
5	TDS	-	2484	15768	1600	3936	3732	3940	3816	4216	3836	4064	5888	1600 - 15768
6	Chlorides	-	865	6798	516	1649	1000	1699	1225	1799	1575	1585	1100	516 - 6798
7	Sulphates	1000	225	1800	289	429	303	223	162	229	232	749	381	162 - 1800
8	Oil and Grease	20	2.8	2.4	1.6	2	2	2	3	4	2	1	2	1 - 4
9	Copper	3	0.1	1.4	<MDL	<MDL	<MDL	0.03	2.2	0.03	0.02	0.02	<MDL	<MDL - 1.4
10	Fluoride	15	1.3	7	1.2	3	1.5	2.8	2.4	1.45	0.85	1.65	1.5	0.85 - 7
11	Cyanides	0.2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
12	Lead	1	<MDL	0.34	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	0.09	0.3	<MDL	<MDL - 0.34
13	Zinc	1.5	0.04	0.38	0.02	<MDL	0.02	0.04	0.6	0.02	0.09	0.2	0.03	<MDL - 0.6
14	Total Chromium	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
15	Ammoniacal Nitrogen	50	417	74	28	80	32	32	19	67	64	61.6	56	19 - 417
16	TRC	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
17	Sulphides	5	8	14	1.6	6	7.2	1.6	3	6	7	16	12.4	1.6 - 16
18	TKN	100	504	89	35	97	35	39	24	81	78	73.6	116	24 - 504
19	Hex.Chromium	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
20	Cadmium	2	<MDL	0.03	0.008	0.02	0.01	<MDL	<MDL	<MDL	0.01	0.02	<MDL	<MDL - 0.03
21	Nickel	3	<MDL	0.23	<MDL	<MDL	<MDL	<MDL	0.05	<MDL	0.03	0.4	<MDL	<MDL - 0.4
22	Phe. Compounds	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
23	Dis. Phosphates	-	0.6	1.1	1.1	1.1	1	0.7	0.5	0.6	1	1	1.1	0.5 - 1.1

Report of Analysis of Treated trade effluent let out into Sea from CUSECS sump-VI

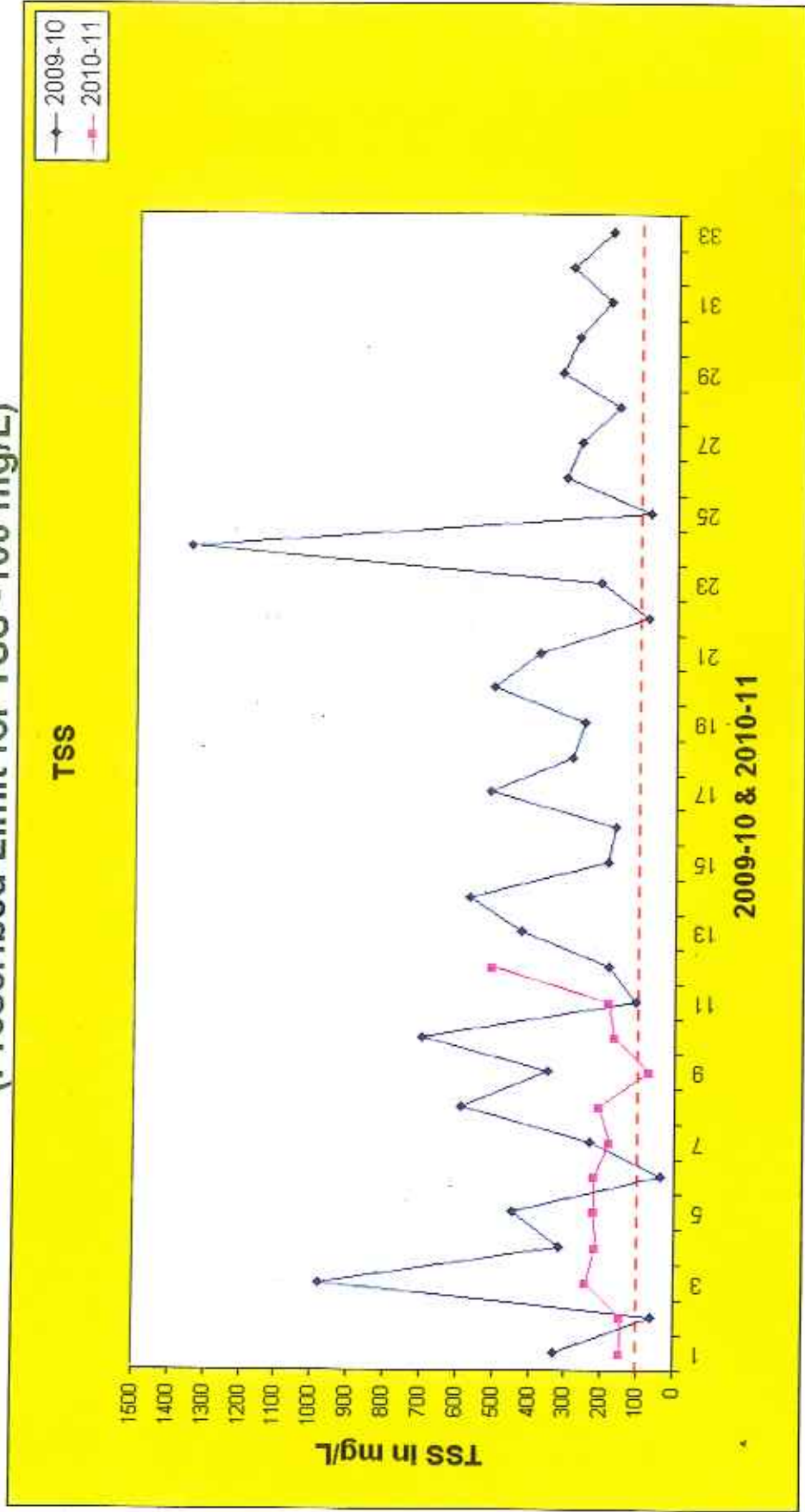
S.No	Parameters	Tolerance Limit	07.04.10	18.04.10	19.04.10	26.04.10	03.05.10	12.05.10	21.05.10	26.05.10	15.06.10	03.06.10	10.06.10	23.06.10	29.06.10
1	pH	5.5 - 9	6.13	6.46	6.55	6.29	6.74	7.58	5.02	6.57	6.79	7.48	7.29	6.72	6.72
2	BOD	100	34	75	72	108	78	100	104	83	129	86	92	126	91
3	COD	250	238	339	256	543	528	656	400	301	719	425	394	613	338
4	TSS	100	144	136	184	148	148	244	216	220	220	180	208	72	168
5	TDS	-	2404	2204	4948	2296	4848	4872	4276	4844	3976	4892	4392	4428	4080
6	Chlorides	-	790	720	2224	1270	2024	2024	1874	2174	1649	2024	1849	1849	2049
7	Sulphates	1000	554	228	745	367	538	284	722	374	292	245	250	650	521
8	Oil and Grease	20	4	2.4	3	3	4	3	4	2	4	3	4	3	2
9	Copper	3	<MDL	<MDL	<MDL	<MDL	0.01	0.01	0.01	<MDL	0.01	0.02	<MDL	<MDL	0.02
10	Fluoride	15	1.35	1.3	1.15	1.7	1.45	2	1.8	2	2.6	1.8	1.4	1.65	1.6
11	Cyanides	0.2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
12	Lead	1	<MDL	0.06	0.08	0.04	0.17	0.1	0.17	0.23	<MDL	0.08	<MDL	<MDL	0.1
13	Zinc	1.5	0.07	0.09	0.05	0.01	0.05	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	0.1
14	Total Chromium	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
15	Ammoniacal Nitrogen	50	88	58.8	87	85	65	66	38	46	69	62	50	74	54
16	TRC	1	0.9	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
17	Sulphides	5	14	5.2	6.4	6.8	8	10	9	8	18	9	6	8	10
18	TKN	100	107	69.4	108	103	79	81	47	57	85	75	61	90	64
19	Hex.Chromium	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
20	Cadmium	2	<MDL	<MDL	<MDL	<MDL	0.01	<MDL	0.01	<MDL	<MDL	0.02	0.02	<MDL	0
21	Nickel	3	<MDL	0.05	<MDL	<MDL	0.03	<MDL	0.07	0.04	<MDL	0.05	<MDL	<MDL	0.02
22	Phe. Compounds	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
23	Dis. Phosphates	-	1	0.9	0.9	1	0.7	1	0.6	0.8	0.4	1.3	1.5	1.1	0.2

ROA of Treated trade effluent let out into sea through CUSECS sump-VI

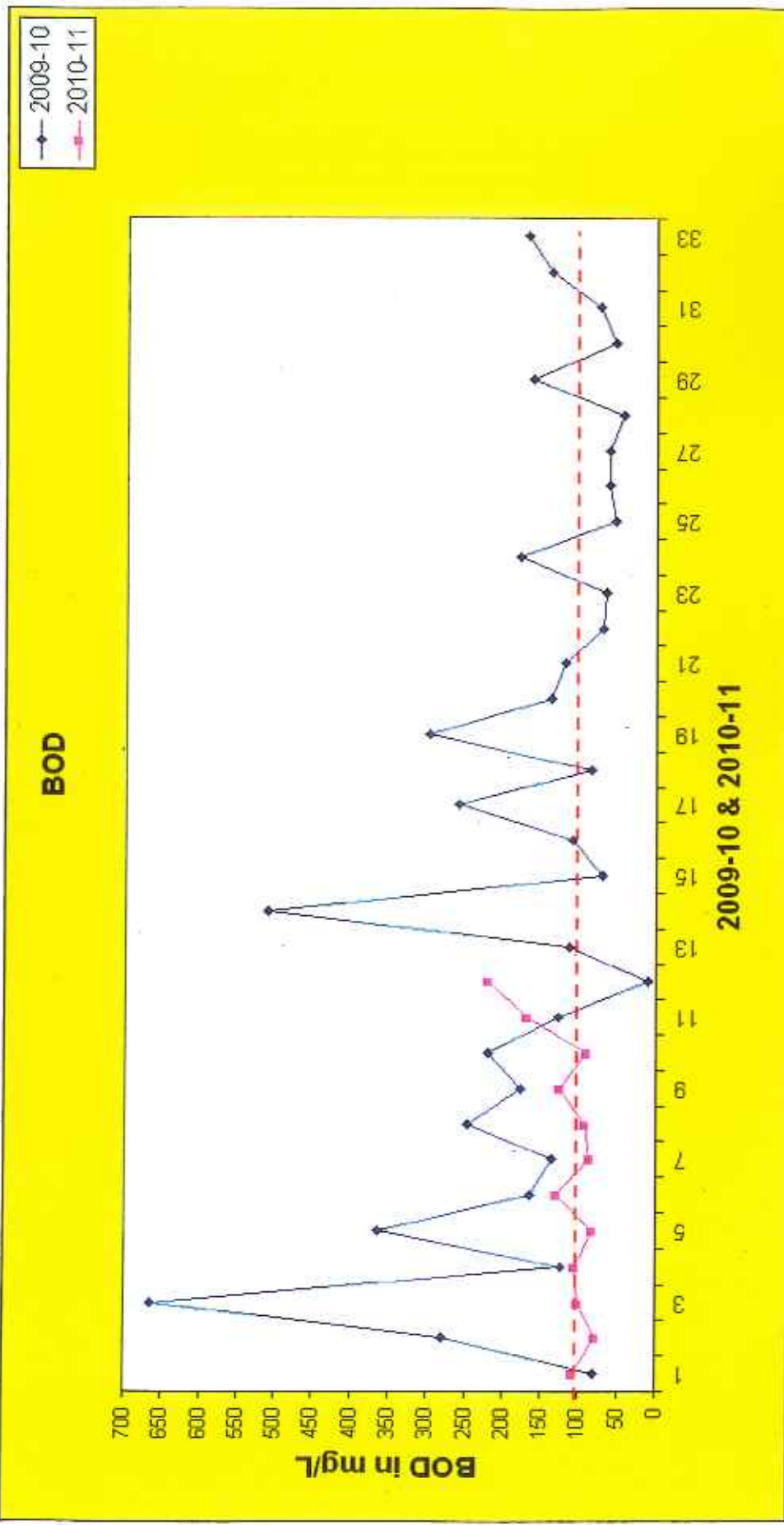
S.No	Parameters	Marine Disposal Standards	units	00.07.10	14.07.10	21.07.10	29.07.10	03.08.10	12.08.10	19.08.10	31.08.10	09.09.10	14.09.10	22.09.10	30.09.10	05.10.10	25.10.10
1	pH	5.5-9		7.08	6.89	7	7.02	7.27	6.99	6.92	6.21	7.28	7.44	6.74	6.91	6.94	7.56
2	BOD	100	mg/L	169	220	103	92	97	88	179	76	77	96	606	118	66	8
3	COD	250	mg/L	410	622	336	395	597	360	880	440	408	394	1306	741	370	32
4	TSS	100	mg/L	184	508	108	88	184	280	276	208	196	160	180	176	112	32
5	TDS	-	mg/L	5904	6144	4012	5404	3216	7440	8020	3708	5552	3188	7484	7100	3720	972
6	Chlorides	-	mg/L	1980	3050	1850	2700	1350	3438	4050	1800	3060	1700	2460	3750	1200	361
7	Sulphates	1000	mg/L	409	323	241	467	529	499	465	392	275	405	375	482	803	142
8	Oil and Grease	20	mg/L	4.2	1	2	6	8	4	4	4.6	4	4.8	4	4.8	4	2
9	Copper	3	mg/L	0.07	0.07	0.03	0.04	0.08	0.02	0.02	0.02	0.03	0.03	0.1	0.03	0.02	0.17
10	Fluoride	15	mg/L	<MDL	1.3	1.6	1.5	1.59	1.56	1.59	1.4	1.04	1.03	1.75	1.3	1.3	0.56
11	Cyanides	0.2	mg/L	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.005
12	Lead	1	mg/L	<MDL	<MDL	<MDL	<MDL	0.04	0.04	<MDL	0.05	0.11	<MDL	0.35	<MDL	<MDL	<0.015
13	inc	1.5	mg/L	0.02	0.02	0.02	0.01	0.03	0.85	0.06	0.76	0.03	0.05	0.44	0.42	0.03	0.13
14	Total Chromium	1	mg/L	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.01
15	Ammoniacal Nitrogen	50	mg/L	47.6	56	49	62	61.6	49	49	43.4	33.6	24	22	70	42	-
16	TRC	1	mg/L	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	177
17	Sulphides	5	mg/L	4	4	3.2	10	12.4	6	9.6	7.2	10.4	3.2	8.4	4.8	4.4	<1
18	TN	100	mg/L	73	67	56	84	83.72	58.8	84.6	49.3	36.9	29	28	78	48	-
19	Hex. Chromium	1	mg/L	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.01
20	Cadmium	2	mg/L	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.0008
21	Nickel	3	mg/L	0.01	0.03	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.006
22	Phc. Compounds	5	mg/L	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.0005
23	Dis. Phosphates	-	mg/L	2.6	3.6	3.2	2.3	2.4	1.6	0.6	0.12	1.45	0.83	1	0.08	1.13	1.48
24	Mercury	0.01	mg/L														<0.005
25	Boron	2	mg/L														<0.02
26	Arsenic	0.2	mg/L														<0.001

* Sample analysed as per Hion,ble High Court

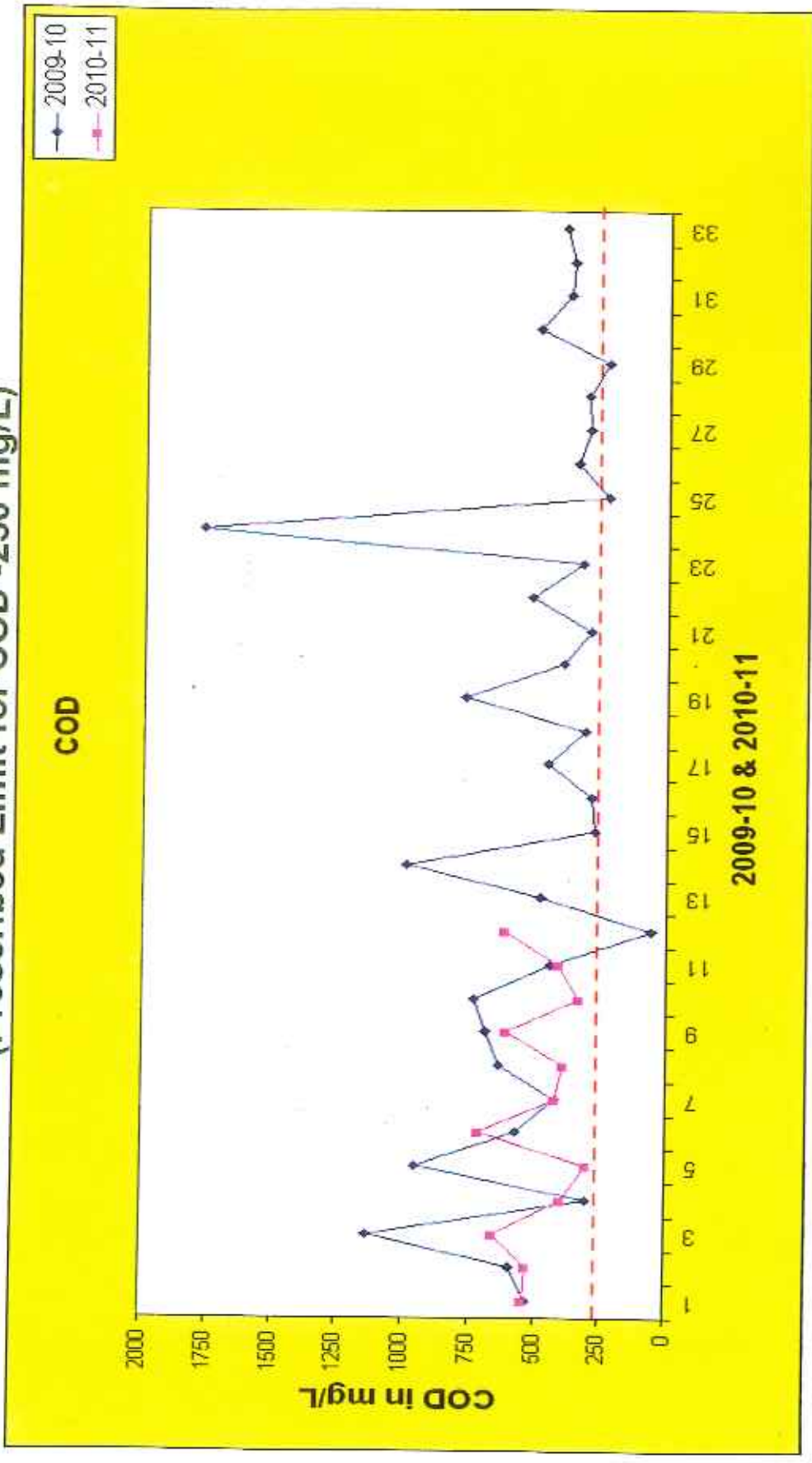
CUSECS LTD - PARAMETER EXCEEDING MARINE DISPOSAL STANDARDS
(Prescribed Limit for TSS -100 mg/L)



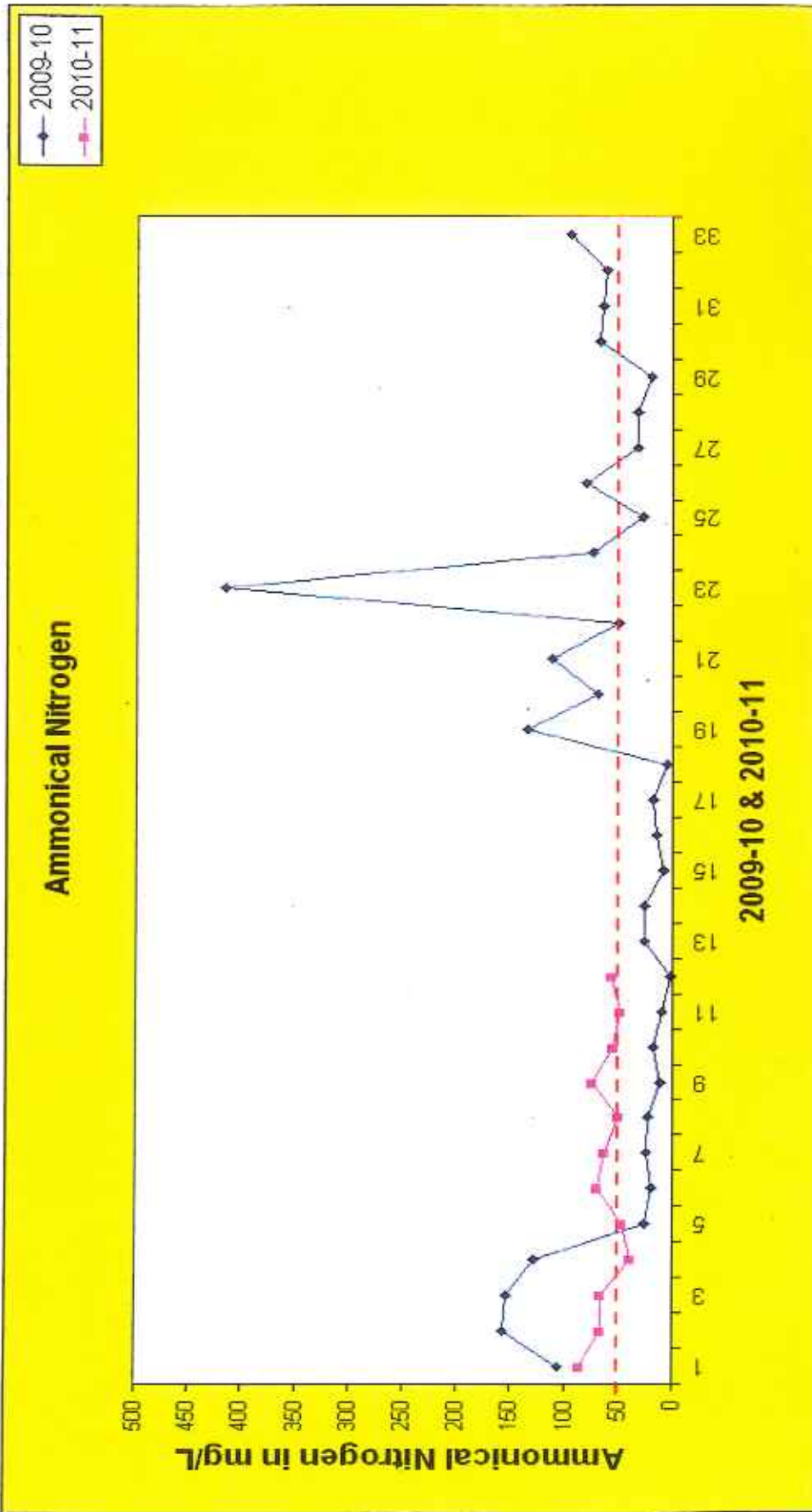
**CUSECS LTD - PARAMETER EXCEEDING MARINE DISPOSAL STANDARDS
(Prescribed Limit for BOD -100 mg/L)**



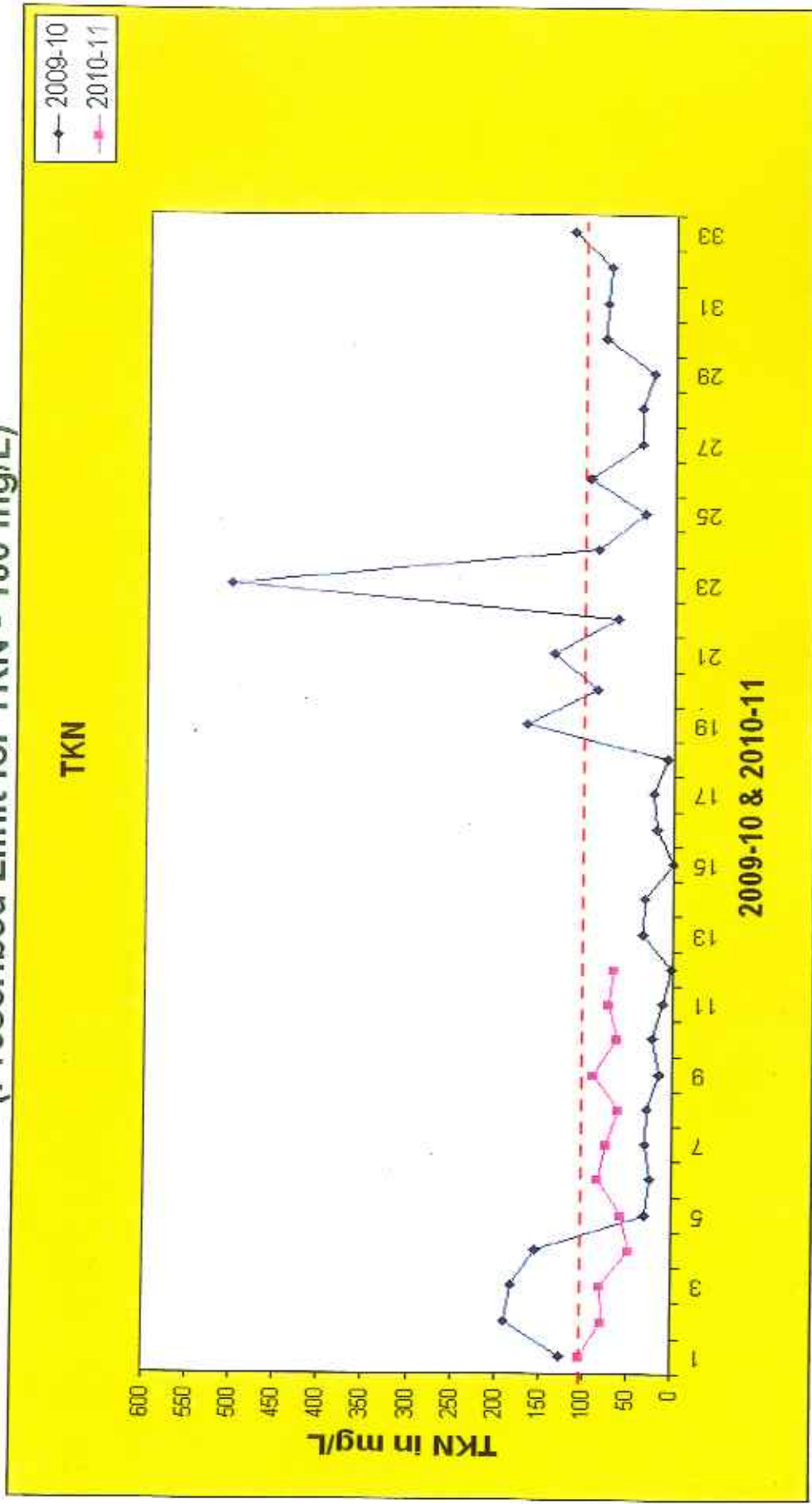
**CUSECS LTD - PARAMETER EXCEEDING MARINE DISPOSAL STANDARDS
(Prescribed Limit for COD -250 mg/L)**



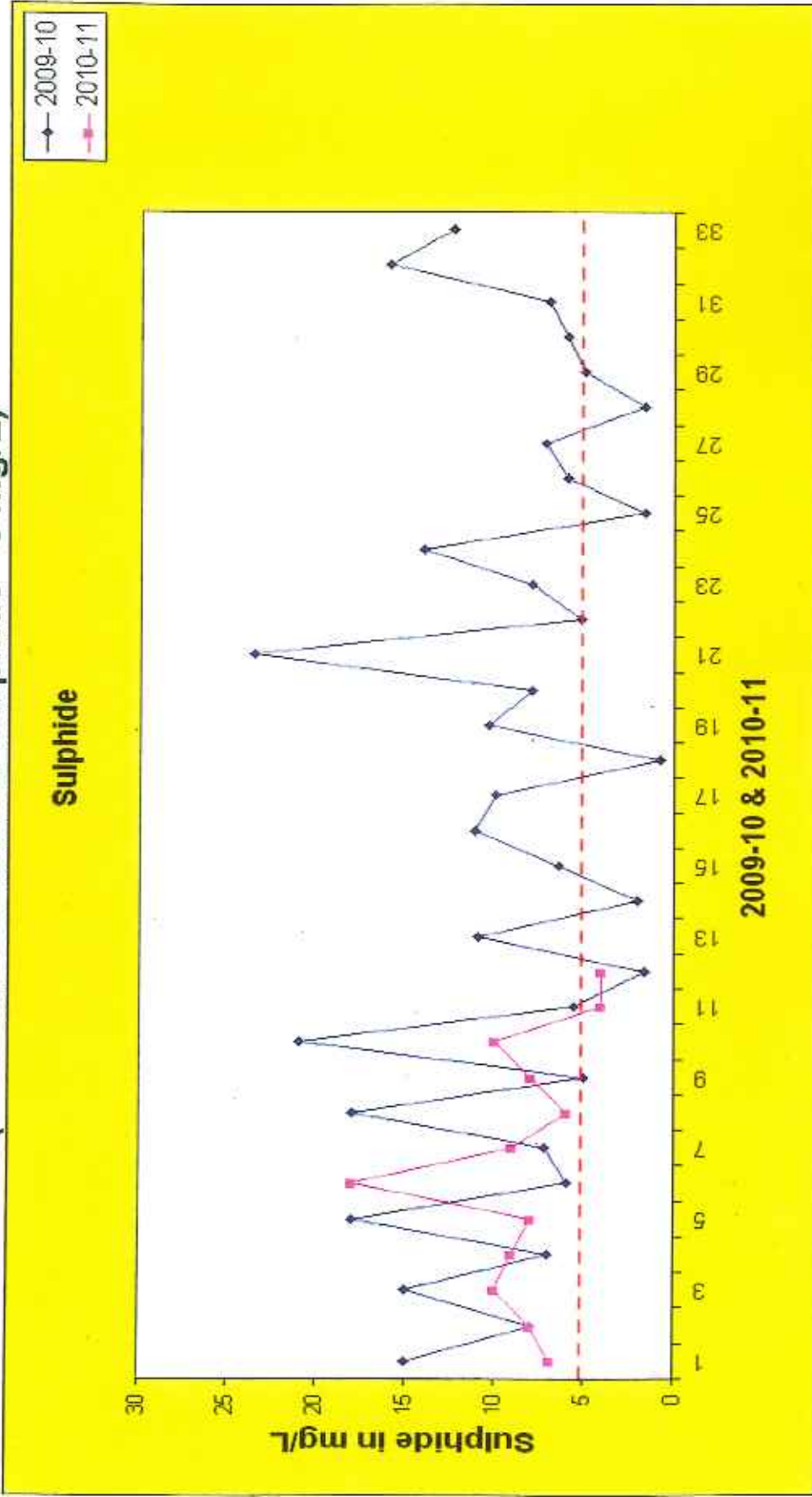
CUSECS LTD - PARAMETER EXCEEDING MARINE DISPOSAL STANDARDS
(Prescribed Limit for Ammonical Nitrogen -50 mg/L)



**CUSECS LTD - PARAMETER EXCEEDING MARINE DISPOSAL STANDARDS
(Prescribed Limit for TKN - 100 mg/L)**



CUSECS LTD - PARAMETER EXCEEDING MARINE DISPOSAL STANDARDS
(Prescribed Limit for Sulphide - 5 mg/L)



ROA of treated trade effluent of M/s. Aurobindo pharma Ltd, SIPCOT, Cuddalore let into CUSECS

Sl.No	Parameters	Unit	Marine Disposal Standards	06.04.10	18.04.10	18.05.10	08.06.10	14.07.10	05.08.10	08.09.10	12.10.10	25.10.10 *
1	pH	-	5.5-9.0	6.24	6.77	6.6	6.72	6.87	6.9	7.17	6.67	6.46
2	BOD	mg/L	100	4	16	11	4	25	13	25	16	14
3	COD	mg/L	250	55	152	24	53	68	30	172	127	80
4	TSS	mg/L	100	52	96	52	24	80	120	60	72	24
5	TDS	mg/L	-	624	2120	1348	764	1072	3680	1988	1844	1584
6	Chlorides	mg/L	-	125	440	290	160	315	1850	660	480	387
7	Sulphates	mg/L	1000	99	180	231	71	325	456	593	557	450
8	Oil and Grease	mg/L	20	2	4 ^B	2	1	1	4	3	4.4	2
9	Sulphides	mg/L	5	<MDL	1.2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<1
10	Cyanides	mg/L	0.2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.005
11	Hex.Chromium	mg/L	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.01
12	Lead	mg/L	1	<MDL	0.14	<MDL	<MDL	<MDL	0.02	0.07	<MDL	<0.015
13	Phe. Compounds	mg/L	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.0005
14	Dis.Phosphates	mg/L	-	<MDL	<MDL	<MDL	0.6	0.8	<MDL	0.48	0.3	0.88
15	TKN	mg/L	100	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	28	-
16	Ammoniacal Nitrogen	mg/L	50	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	22	-
17	TRC	mg/L	1	<MDL	2.6	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<1
18	Total Chromium	mg/L	2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.01

* Sample analysed as per Hon'ble High Court

District Environmental Engineer
Tamilnadu Pollution Control Board
Cuddalore

M/s. Clariant Chemicals (India) Limited, SIPCOT Industrial Complex, Cuddalore.

Parameters	Units	18.05.09	08.06.09	20.07.09	07.08.09	16.09.09	13.11.09	18.12.09	08.01.10	04.02.10	08.03.10
	Tolerance Limit										
pH	-	7.9	7.43	8.26	7.37	6.5	6.18	6.27	7.07	6.85	6.52
BOD	mg/L	9	2	7	2	3	3	2	10	5	3
COD	mg/L	47	55	32	16	39	24	24	63	30	8
TSS	mg/L	40	56	20	16	20	92	16	12	20	16
TDS	mg/L	1008	824	588	648	1308	672	452	468	672	988
Chlorides	mg/L	100	85	130	66	315	230	60	62	150	125
Sulphates	mg/L	276	226	13	19	98	117	100	80	92	72
Oil and Grease	mg/L	<MDL	1.2	<MDL	<MDL	<MDL	8	3.2	2	1	1
Copper	mg/L	3	0.01	0.02	<MDL	0.01	0.01	0.08	<MDL	<MDL	<MDL
Lead	mg/L	1	0.02	0.03	<MDL	<MDL	0.005	0.01	0.03	<MDL	<MDL
Zinc	mg/L	1.5	0.06	0.01	0.01	0.03	0.02	0.04	0.02	<MDL	0.01
Phenolic Compounds	mg/L	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
TKN	mg/L	100	6	<MDL	1.7	1.1	1.4	<MDL	<MDL	<MDL	<MDL
Cadmium	mg/L	2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	0.004	0.009	<MDL
Nickel	mg/L	3	0.03	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Total Chromium	mg/L	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Hex. Chromium	mg/L	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Amm. Nitrogen	mg/L	100	4.2	<MDL	1.4	0.8	1.1	<MDL	<MDL	<MDL	<MDL

ROA of treated trade effluent of M/s. Clariant Chemicals India Ltd

S.No.	Parameters	Units	Tolerance Limit	08.04.10	26.05.10	08.06.10	14.07.10
1	pH	-	5.5 - 9.0	5.98	6.92	6.82	7.16
2	BOD	mg/L	100	2	4	3	9
3	COD	mg/L	250	48	226	75	17
4	TSS	mg/L	100	208	44	44	12
5	TDS	mg/L	-	868	740	1156	612
6	Chlorides	mg/L	-	195	-	295	175
7	Sulphates	mg/L	1000	225	-	283	105
8	Oil and Grease	mg/L	20	1	2	3	1
9	Copper	mg/L	3	<MDL	0.006	0.01	0.0697
10	Lead	mg/L	1	<MDL	<MDL	0.05	<MDL
11	Zinc	mg/L	1.5	0.03	0.1	<MDL	<MDL
12	Phenolic Compounds	mg/L	5	<MDL	<MDL	<MDL	<MDL
13	TKN	mg/L	100	<MDL	<MDL	<MDL	<MDL
14	Cadmium	mg/L	2	<MDL	<MDL	0.02	<MDL
15	Nickel	mg/L	3	<MDL	<MDL	<MDL	<MDL
16	Total Chromium	mg/L	1	<MDL	<MDL	<MDL	<MDL
17	Hex. Chromium	mg/L	1	<MDL	<MDL	<MDL	<MDL
18	Amtn. Nitrogen	mg/L	100	<MDL	<MDL	<MDL	<MDL

ROA Treated Trade Effluent of M/s. Loyal Super Fabrics, SIPCOT, Cuddalore

S.No	Parameters	Units	20.04.08	18.05.08	15.06.09	15.07.09	11.08.09	16.09.09	18.10.09	13.11.09	10.12.09	22.01.10	22.02.10	10.03.10
1	pH		7.69	8.59	8.2	7.93	7.4	6.81	6.35	7.11	6.92	7.03	6.77	8.83
2	BOD	mg/L	41	38	21	27	21	3	8	63	27	46	18	10
3	COD	mg/L	191	437	139	134	140	48	80	337	96	385	240	56
4	TSS	mg/L	12	152	128	32	200	20	68	160	100	84	98	92
5	TDS	mg/L	1424	4244	3252	1704	3060	1372	1644	3766	2432	3536	2196	2324
6	Chlorides	mg/L	386	1525	1100	500	1050	565	130	1799	890	1924	1175	1350
7	Sulphates	mg/L	85	168	120	84	114	48	306	299	145	137	20	224
8	Oil and Grease	mg/L	2.4	2.4	2.4	2	2	2	<MDL	4	3.2	1.2	1	3
9	Sulphides	mg/L	1.1	<MDL	2	2	4	4.4	1.2	3.2	1.6	<MDL	4	2
10	Phc. Compounds	mg/L	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
11	Total Kjeldhal Nitrogen	mg/L	5.6	15	<MDL	1.1	1.7	1.1	0.6	1.6	<MDL	<MDL	<MDL	8
12	Ammoniacal Nitrogen	mg/L	4.2	13	<MDL	0.8	1.4	0.6	0.3	1.4	<MDL	<MDL	<MDL	6
13	Total Residual Chlorine	mg/L	-	-	-	-	-	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL

ROA Treated Trade Effluent of M/s. Loyal Super Fabrics, SIPCOT, Cuddalore let into CUSECS												
S.No	Parameters	units	Marine Disposal standards	26.04.10	12.05.10	08.05.10	02.07.10	12.08.10	09.09.10	12.10.10	25.10.10 *	
1	pH	-	5.5 - 9.0	6.77	7.34	7.72	7.29	7.1	6.41	7.33	6.63	
2	BOD	mg/L	100	14	11	34	43	25	17	15	12	
3	COD	mg/L	250	89	152	451	294	64	82	51	88	
4	TSS	mg/L	100	88	164	208	68	76	12	40	60	
5	TDS	mg/L	-	1952	3380	4244	3282	1840	508	640	872	
6	Chlorides	mg/L	-	120	875	1749	1375	635	145	145	300	
7	Sulphates	mg/L	1000	240	112	156	269	276	134	149	88	
8	Oil and Grease	mg/L	20	4	2	2	3	1	1	2	2	
9	Sulphides	mg/L	6	1.6	7	2	9	<MDL	<MDL	<MDL	<1	
10	Phe.Compounds	mg/L	6	<MDL	<MDL	<MDL		<MDL	<MDL	<MDL	<0.0005	
11	Total Kjeldhal Nitrogen	mg/L	100	<MDL	13	<MDL	25	<MDL	<MDL	5	-	
12	Ammoniacal Nitrogen	mg/L	50	<MDL	10	<MDL	20	<MDL	<MDL	2	-	
13	Total Residual Chlorine	mg/L	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	3.5	

* Sample analysed as per Hon'ble High Court

District Environmental Engineer
Tamilnadu Pollution Control Board
Cuddalore

ROA of Treated Trade Effluent Of M/s TANFAC Industries Ltd., SIPCOT, Cuddalore															
Sl.No	Parameters	Unit	Tolerance Limit	18.05.09	15.06.09	13.07.09	11.08.09	10.09.09	13.10.09	11.11.09	01.12.09	08.01.10	13.01.10	10.02.10	08.03.10
1	pH	-	S.S-9.0	8.4	8.1	6.7	7.42	7	6.3	6.53	6.38	6.92	6.54	6.25	3.86
2	BOD	mg/L	30	9	3	2	18	6	3	4	2	4	3	18	2
3	COD	mg/L	250	55	16	8	66	56	40	31	24	55	91	120	8
4	TSS	mg/L	100	176	104	48	86	72	24	16	12	8	40	8	12
5	TDS	mg/L	2100	3504	2332	1476	1952	2016	844	728	540	392	628	392	452
6	Chlorides	mg/L	1000	300	300	160	120	485	170	180	100	54	175	56	88
7	Sulphates	mg/L	1000	1612	1296	619	932	46	217	212	186	43	186	20	26
8	Oil and Grease	mg/L	10	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	1.2	2.8	2	3	1	1
9	Fluorides	mg/L	2	1.95	2	1.9	1.8	1.5	1.2	0.25	1	0.7	1.5	1.4	1.15
10	Sulphides	mg/L	2	<MDL	0.4	<MDL	<MDL	1.6	1.2	<MDL	3.2	<MDL	<MDL	1.6	<MDL
11	Ammonia Nitrogen	mg/L	50	<MDL	<MDL	1	0.6	0.6	0.6	2.8	<MDL	<MDL	<MDL	<MDL	<MDL
12	Phen. Compound	mg/L	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
13	TKN	mg/L	100	<MDL	<MDL	1.4	0.8	0.8	0.8	3.6	<MDL	<MDL	<MDL	<MDL	<MDL

ROA of Treated Trade Effluent Of M/s TANFAC Industries Ltd. (Afr3 & Cryolite Plant)SIPCOT, Cuddalore												
S.No	Parameters	Unit	Marine Disposal standards	05.04.10	06.05.10	08.06.10	09.07.10	03.08.10	27.09.10	08.10.10	25.10.10 *	
1	pH	-	5.5-9.0	6.06	6.36	7.1	7.23	7.04	6.83	6.64	6.95	
2	BOD	mg/L	100	3	3	7	2	3	3	14	2	
3	COD	mg/L	250	32	129	38	164	88	97	34	16	
4	TSS	mg/L	100	36	32	40	84	8	20	20	20	
5	TDS	mg/L	-	408	420	1044	2648	484	452	1476	438	
6	Chlorides	mg/L	-	56	60	355	1445	78	170	145	91	
7	Sulphates	mg/L	1000	83	46	138	140	112	20	133	63	
8	Oil and Grease	mg/L	20	4	1	2	1	4	1	1	1	
9	Fluorides	mg/L	15	0.05	0.85	2.4	<MDL	1.32	1.1	1.89	6.42	
10	Sulphides	mg/L	5	<MDL	<MDL	3	-	<MDL	<MDL	<MDL	<1	
11	Amm.Nitrogen	mg/L	50	<MDL	<MDL	<MDL	<MDL	<MDL	2	1	-	
12	Phe.Compounds	mg/L	5	-	<MDL	<MDL	<MDL	<MDL	-	-	<0.0005	
13	TKN	mg/L	100	<MDL	<MDL	<MDL	<MDL	<MDL	3.4	2	-	

* Sample analysed as per Hon'ble High Court

District Environmental Engineer
Tamilnadu Pollution Control Board
Cuddalore

ROA of Treated Trade Effluent of M/s. Arkema Peroxides India Ltd let into CUSECS for Marine Disposal

Parameters	Units	Tolerance Limits													
		21.04.09	19.05.08	15.06.09	13.07.09	11.08.09	10.08.8	16.09.09	15.10.09	17.11.09	08.12.09	05.01.10	11.01.10	12.02.10	10.03.10
pH		8.29	8.51	8.76	7.93	7.15	6.91	6.97	7.11	7.18	7.25	7.43	7.34	7.24	6.2
BOD	mg/L	17	17	7	50	20	13	16	46	26	9	2	14	2	37
COD	mg/L	154	156	119	222	153	160	200	160	80	80	236	167	197	156
TSS	mg/L	628	592	504	612	91	504	764	644	236	84	88	448	98	704
TDS	mg/L	20368	13612	20880	17244	19764	12048	19108	15924	14012	15044	7876	12700	15708	26840
Chlorides	mg/L	9997	5848	8697	9697	8997	5048	7748	7448	6498	4898	3799	6298	8547	950
Sulphates	mg/L	1050	895	1458	320	1270	1440	1520	5280	606	527	324	1358	710	809
Oil and Grease	mg/L	<MDL	1.2	1.2	<MDL	<MDL	1	2	<MDL	1.2	2.8	2	2	1	1.6
Ammt.Nitrogen	mg/L	8.4	4	1.7	1.6	0.6	2.2	5.9	0.8	5.6	2.8	<MDL	<MDL	<MDL	<MDL
Phc. Compounds	mg/L	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
TKN	mg/L	9.8	6	2.2	1.9	0.8	2.8	7.8	1.1	7.5	4.2	<MDL	<MDL	<MDL	<MDL
Sulphide	mg/L	-	-	-	-	-	-	-	-	-	<MDL	-	-	-	-

ROA of treated trade effluent of M/s. Arkema Peroxides India Ltd., let into CUSECS											
S.N	Parameters	units	Marine Disposal Standards	18.04.10	23.04.10	05.05.10	10.06.10	05.07.10	05.08.10	08.09.10	06.10.10
1	pH		5.5 - 9.0	7.4	7.26	7.13	7.69	7.48	7.49	7.89	7.32
2	BOD	mg/L	100	6	21	3	15	3	6	10	9
3	COD	mg/L	250	160	244	76	227	131	150	157	83
4	TSS	mg/L	100	96	80	84	54	92	76	76	98
5	TDS	mg/L	.	12296	13912	18460	16032	14880	14496	12716	10236
6	Chlorides	mg/L	.	4948	5523	9397	3900	7000	6325	6650	4155
7	Sulphates	mg/L	1000	541	587	664	736	366	932	587	618
8	Oil and Grease	mg/L	20	4	2	1	1	1	1	1	2
9	Amm.Nitrogen	mg/L	50	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
10	Phe. Compounds	mg/L	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
11	TKN	mg/L	100	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL

* Sample analysed as per Hon,ble High Court

ROA of treated trade effluent of M/s Bayer Material Science (P) Ltd

S.No	Parameters	Units	Tolerance Limit *	21.04.09	19.05.09	13.07.09	11.08.09	16.09.09	15.10.09	08.12.09	11.01.10	12.02.10	10.03.10
1	pH	-	5.5-9.0	7.71	8.27	7.43	6.87	7.13	7.23	7.34	6.67	7.6	7.25
2	BOD	mg/L	30	31	18	8	7	15	6	2	18	2	10
3	COD	mg/L	250	160	78	61	74	152	32	96	98	118	195
4	TSS	mg/L	100	152	84	48	20	48	40	32	36	16	24
5	TDS	mg/L	2100	820	804	688	652	720	684	700	680	560	624
6	Chlorides	mg/L	1000	140	110	90	106	240	115	94	95	126	105
7	Sulphates	mg/L	1000	26	12	6	27	27	284	176	54	29	71
8	Oil and Grease	mg/L	10	2	1.2	8	<MDL	<MDL	<MDL	1.6	1.2	2	2
9	Cyanides	mg/L	0.2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
10	Phenolic Compounds	mg/L	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL

ROA of treated trade effluent of M/s Bayer Material Science (P) Ltd let into CUSECS

S.No	Parameters	Units	Marine Disposal standards	23.04.10	18.05.10	10.06.10	06.07.10	95.08.10	08.09.10	06.10.10	25.10.10 *
1	pH	-	5.5 - 9.0	7.15	7.5	8.07	6.52	6.91	7.94	6.96	7.74
2	BOD	mg/L	100	28	24	3	3	10	30	2	25
3	COD	mg/L	250	228	160	113	33	51	225	83	176
4	TSS	mg/L	100	76	28	36	16	36	44	24	34
5	TDS	mg/L	-	676	568	504	592	480	568	964	484
6	Chlorides	mg/L	-	130	120	84	120	165	240	275	92
7	Sulphates	mg/L	1000	256	112	40	100	106	96	298	55
8	Oil and Grease	mg/L	20	2	1	2	4.2	2	1	2	1
9	Cyanides	mg/L	0.2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.005
10	Phenolic Compounds	mg/L	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.0006

* Sample analysed as per Hon'ble High Court

District Environmental Engineer
Tamilnadu Pollution Control Board
Cuddalore

ROA of Treated trade effluent of M/s. Pandian Chemicals Ltd.,

S.No	Parameters	units	Tolerance limit	13.07.09	20.08.09	07.09.09	30.10.09	17.11.09	08.12.09	11.01.10	18.02.10	10.03.10
1	PH		5.5 - 9.0	7.67	6.87	7.13	6.95	6.58	7.16	7.34	6.81	7.03
2	BOD	mg/L	30	20	108	4	2.2	3	3	8	2	7
3	COD	mg/L	250	102	403	22	106	48	48	83	40	111
4	TSS	mg/L	100	444	312	76	412	240	336	360	220	408
5	TDS	mg/L	2100	7860	7452	2012	6368	6976	9112	8232	2076	8840
6	Chlorides	mg/L	1000	4374	3019	970	3149	3649	4599	4149	800	3799
7	Sulphates	mg/L	1000	5	42	10	634	40	149	83	19	64
8	Oil and Grease	mg/L	10	<MDL	2	<MDL	<MDL	1	1.6	1.6	2	2
9	Sulphide	mg/L	2	7	5.6	2.8	<MDL	3	<MDL	1.2	<MDL	<MDL
10	Cyanide	mg/L	0.2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
11	Dis. Phosphates	mg/L	5	1.9	1.4	0.8	<MDL	0.5	<MDL	<MDL	<MDL	0.3
12	Fluorides	mg/L	2	-	2.5	1.1	0.41	0.53	0.8	0.5	0.55	1.25

ROA of Treated trade effluent of M/s. Pandian Chemicals Ltd.,let into CUSECS

S.No	Parameters	units	Marine disposal standards	23.04.10	26.05.10	15.06.10	14.07.10	05.08.10	22.09.10	06.10.10	25.10.10 *
1	PH		5.5 - 9.0	7.21	7.44	7.36	7.1	7.73	6.78	7.69	8.03
2	BOD	mg/L	100	5	-12	2	4	6	3	2	2
3	COD	mg/L	250	71	150	94	8	37	82	33	16
4	TSS	mg/L	100	48	96	88	88	96	68	24	2
5	TDS	mg/L	-	596	11716	7912	8582	7180	17108	628	1418
6	Chlorides	mg/L	-	165	3949	4074	4635	3400	9250	230	573
7	Sulphates	mg/L	1000	206	100	137	63	547	32	151	53
8	Oil and Grease	mg/L	20	3	1	2	1	2	1	1	2
9	Sulphide	mg/L	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<1
10	Cyanide	mg/L	0.2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.005
11	Dis. Phosphates	mg/L	-	<MDL	<MDL	0.1	<MDL	<MDL	0.03	<MDL	0.01
12	Fluorides	mg/L	15	0.25	2	2.8	0.6	1.79	1.6	<MDL	<0.1

* Sample analysed as per Hon'ble High Court

ROA of Treated Trade Effluent of M/s. Pioneer Jellicce India (P) Ltd, Cuddalore

S.No	Parameters	units	Tolerance	25.04.09	22.05.09	02.06.09	09.07.09	11.08.09	05.10.09	17.11.09	24.11.09	08.12.09	11.01.10	13.01.10	22.02.10	10.03.10
1	pH		5.5 - 9.0	7.73	7.6	7.95	6.98	6.24	6.25	6.76	6.82	6.5	6.85	6.5	6.38	6.78
2	BOD	mg/L	100	252	3	19	138	106	273	19	14	76	28	80	129	370
3	COD	mg/L	250	828	65	104	535	574	1008	166	37	360	212	409	432	540
4	TSS	mg/L	100	96	8	52	536	364	568	64	56	230	84	152	488	416
5	TDS	mg/L		2920	952	1404	8228	3162	6252	1017	884	6144	1360	5008	4024	3776
6	Chlorides	mg/L		744	160	580	1425	1425	2699	280	230	2239	420	1949	2624	1674
7	Sulphates	mg/L	1000	24	20	67	100	28	75	26	196	349	84	920	40	137
8	Oil and Grease	mg/L	20	2.6	<MDL	1.2	8	4	2	1	2	3.2	7	7	2	1.8
9	Amm. Nitrogen	mg/L	50	56	0.8	53	9.89	35	26	28	19.8	84	64	70	57	57
10	Phe. Compounds	mg/L	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	0.4	<MDL	<MDL	<MDL
11	Fluorides	mg/L	15	<MDL	0.4	0.47	0.6	0.5	1.4	0.2	0.75	0.6	0.5	1.2	1	1.2
12	Sulphides	mg/L	5	7	<MDL	3	2.4	10	2	<MDL	2	2.4	4.4	2.4	5.2	<MDL
13	Dis. Phosphates	mg/L		0.04	<MDL	<MDL	0.1	<MDL	4	0.2	<MDL	0.2	0.4	0.3	<MDL	0.5
14	TKN	mg/L	100	70	1	63	109	47	31	35.2	-	118	78	-	70	71
15	Calcium	mg/L							424	61	-	480	64	-	-	828

ROA of Treated Trade Effluent of M/s. Pioneer Jellicce India (P) Ltd, Cuddalore let into CUSECS												
S.No	Parameters	units	Marine disposal standards	18.04.10	22.04.10	17.05.10	10.06.10	02.07.10	05.08.10	02.09.10	06.10.10	25.10.10 *
1	pH	-	5.5 - 9.0	6.5	6.49	7.03	7.33	6.72	7.33	6.99	7.24	7.71
2	BOD	mg/L	100	240	100	22	49	25	18	53	20	5
3	COD	mg/L	250	1104	277	184	293	227	66	480	142	48
4	TSS	mg/L	100	200	356	96	76	64	80	78	40	16
5	TDS	mg/L	-	3880	2008	1904	1720	1580	1500	1612	856	680
6	Chlorides	mg/L	-	1000	720	580	490	375	575	410	260	237
7	Sulphates	mg/L	1000	90	136	55	30	139	405	107	140	46
8	Oil and Grease	mg/L	20	3	1	2	1	3	3	4	2.8	2
9	Amm.Nitrogen	mg/L	50	68	45	47	43	97	42	21	20	-
10	Phe.Compounds	mg/L	5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<0.0005
11	Fluorides	mg/L	15	0.8	0.2	1.15	0.65	0.75	1.8	1.4	1.35	<0.005
12	Sulphides	mg/L	5	12.8	4.8	10	5	6	2.8	10	2.8	<1
13	Dis.Phosphates	mg/L	-	0.5	0.4	0.5	0.09	0.1	<MDL	1.02	0.17	0.09
14	TKN	mg/L	100	85	56	56	53	117	63	26.04	24	-
15	Calcium	mg/L	-	-	45	13	46	57	107	80	86	67

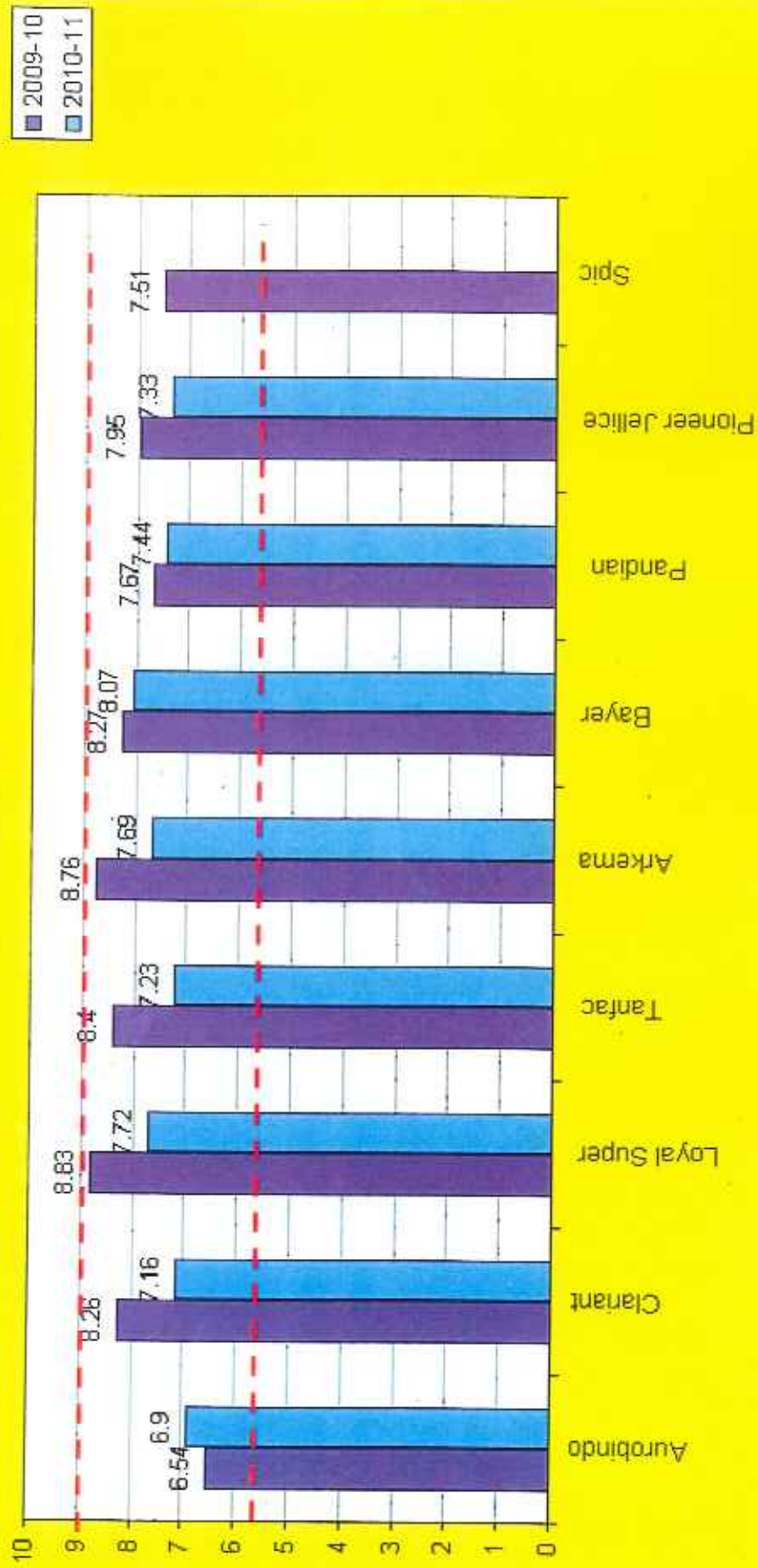
* Sample analysed as per Hon'ble High Court

District Environmental Engineer
Tamilnadu Pollution Control Board
Cuddalore

ROA of Treated Trade Effluent of M/s. SPIC Pharmaceutical Division Ltd., Cuttalore									
S.No	Parameters	units	Tolerance Limits	22.04.08	27.10.09	13.11.09	8.12.09	15.02.10*	
	pH		5.5-9.0	9.01	7.51	7.27	7.39	6.88	
2	BOD	mg/L	30	28	53	60	11	2	
3	COD	mg/L	250	277	303	125	224	55	
4	TSS	mg/L	100	72	108	108	96	16	
5	TDS	mg/L	2100	1872	1048	1336	2384	492	
6	Chlorides	mg/L	1000	185	260	600	140	102	
7	Sulphates	mg/L	1000	105	260	296	998	36	
8	Oil and Grease	mg/L	10	0.8	1	1	3.2	2	
9	Sulphides	mg/L	2	15	13.6	8	6	<MDL	
10	Phe.Compounds.	mg/L	1	<MDL	<MDL	<MDL	<MDL	<MDL	
11	Cyanides	mg/L	0.2	<MDL	<MDL	<MDL	<MDL	<MDL	
12	Hex.Chromium	mg/L	1	<MDL	<MDL	<MDL	<MDL	<MDL	
13	Amm.Nitrogen	mg/L	50		18 ^a	60	<MDL		
14	TKN	mg/L	100						
15	Lead	mg/L	0.1	<MDL	24 ^c	78	<MDL	111	<MDL

* Only class C effluent discharge

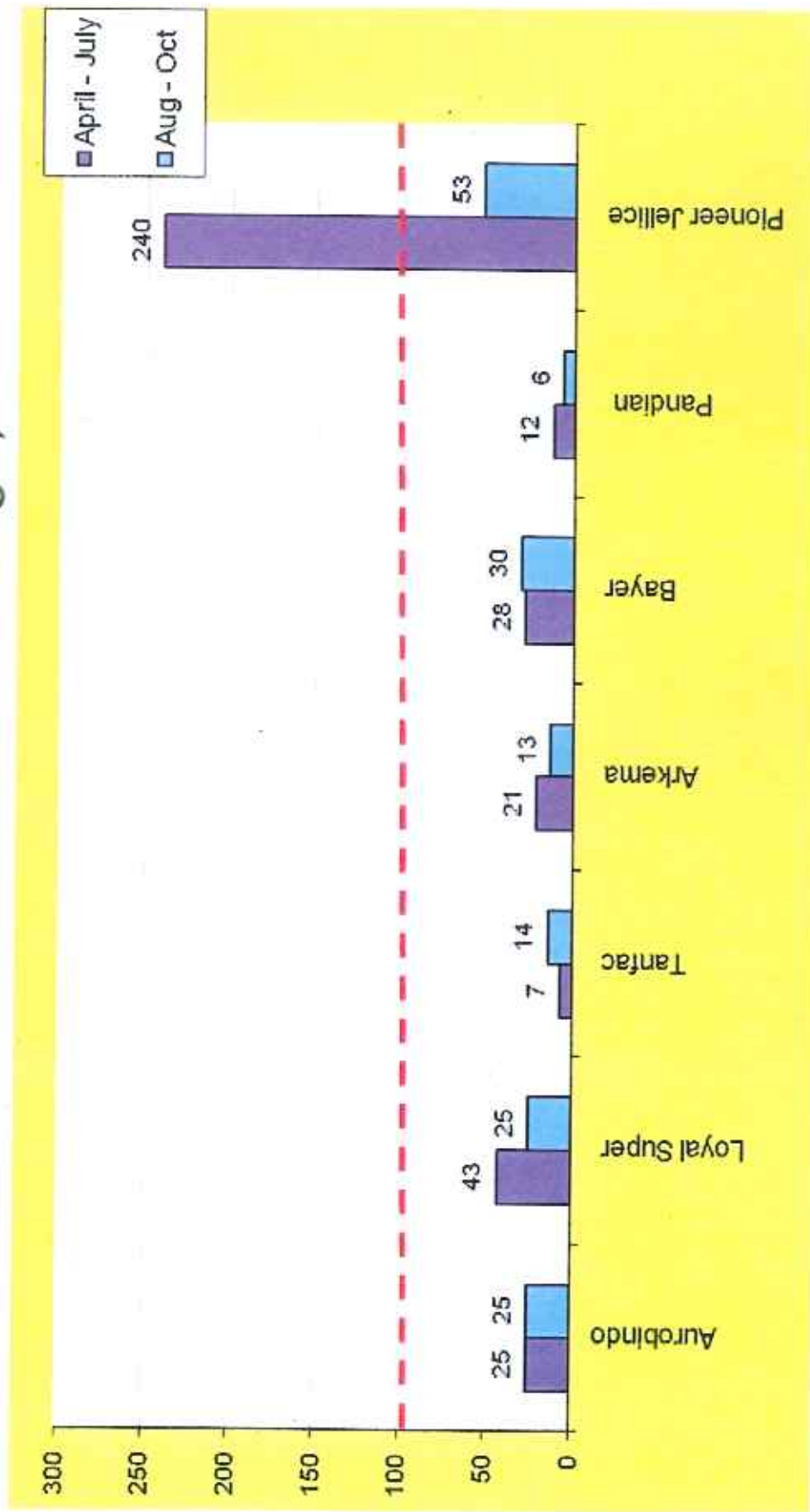
TREND CHART OF pH IN TREATED EFFLUENT (2009-10 & 2010-11) (Prescribed Limit for pH - 5.5 - 9)



TREND CHART OF CUSECS MEMBER UNITS

BOD IN TREATED EFFLUENT

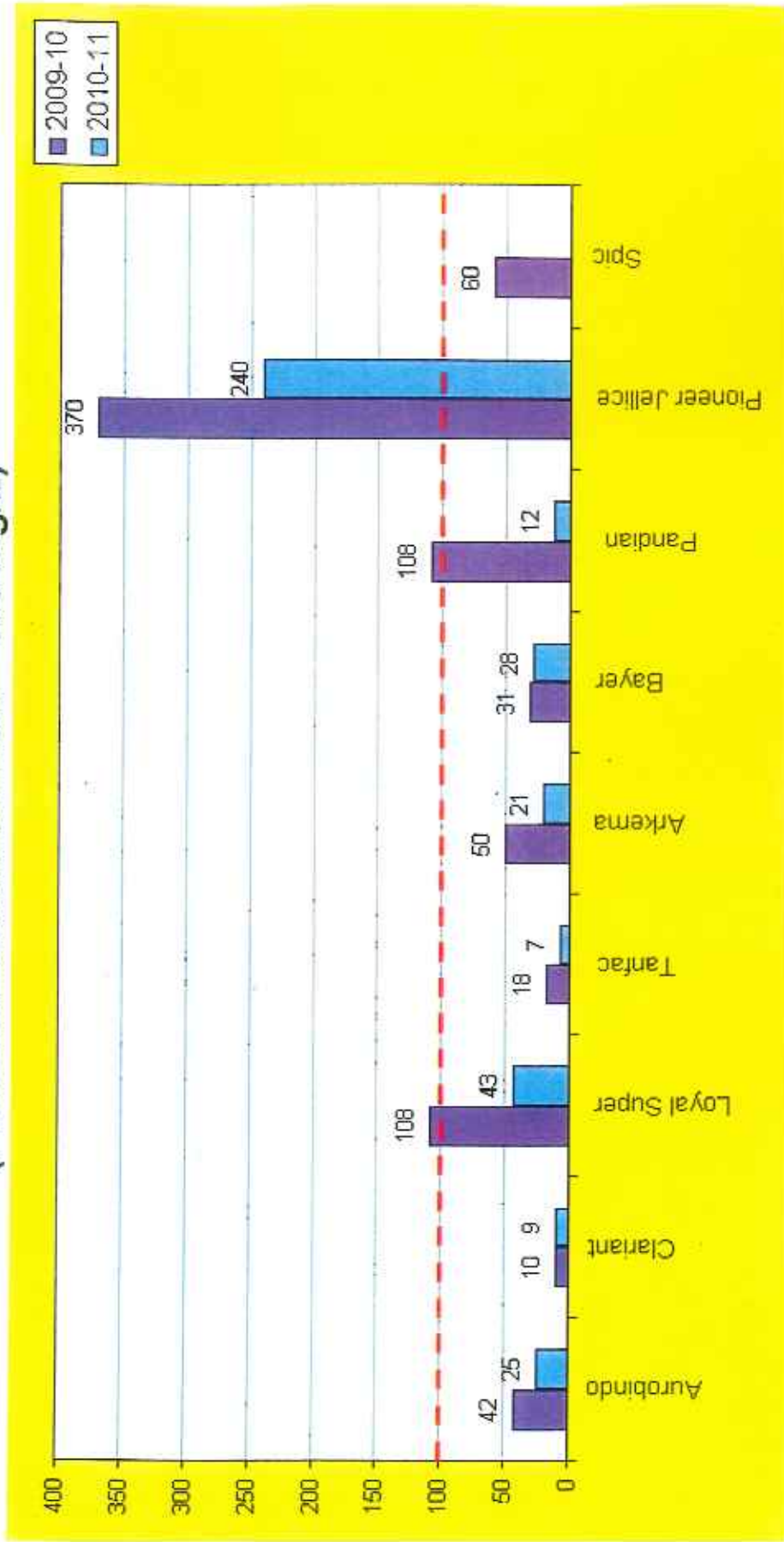
(Prescribed Limit for BOD - 100mg/L)



2010-2011

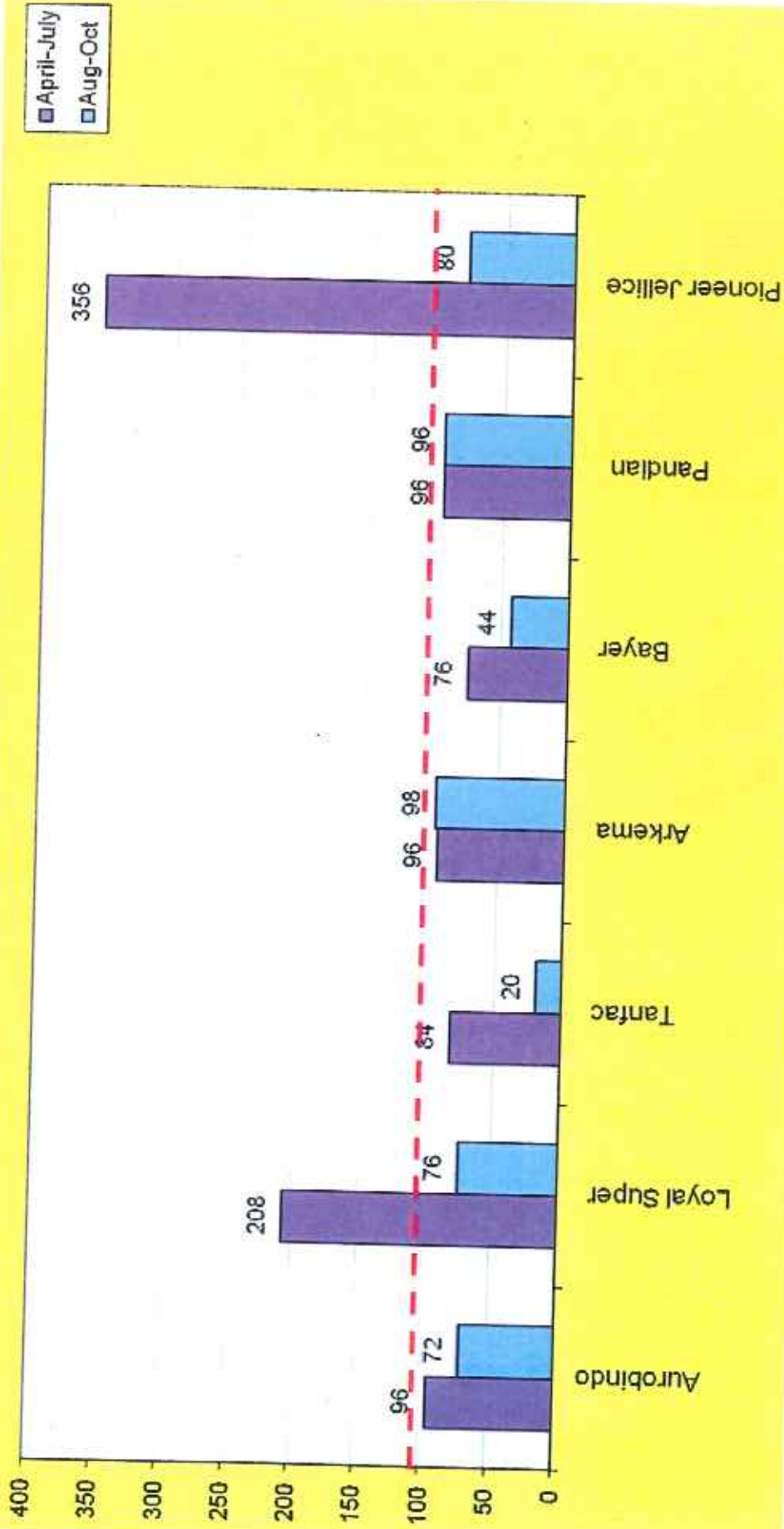
99

**TREND CHART OF BOD IN TREATED EFFLUENT
(2009-10 & 2010-11)
(Prescribed Limit for BOD - 100 mg/L)**



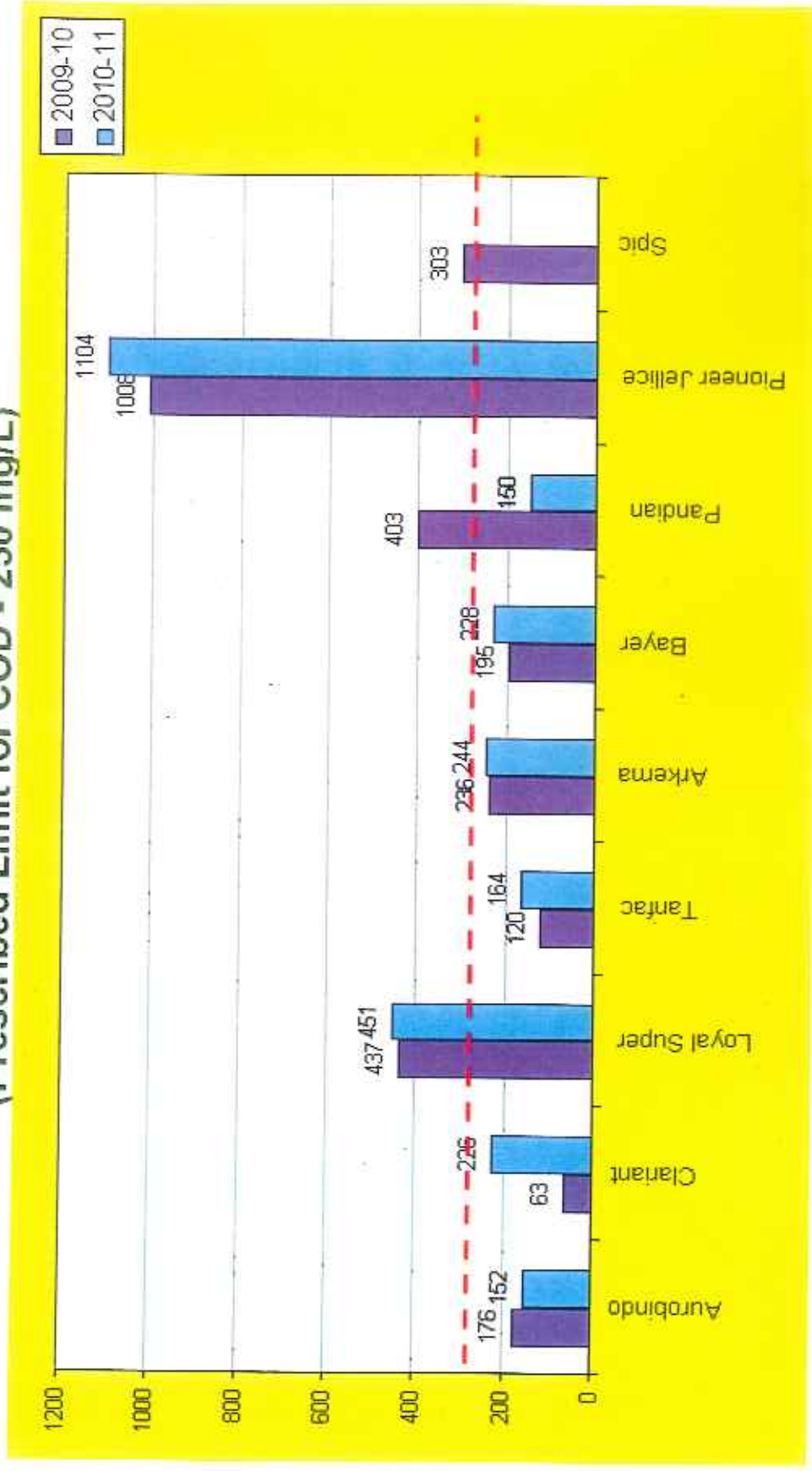
TREND CHART OF CUSECS MEMBER UNITS

TSS IN TREATED EFFLUENT
(Prescribed Limit for TSS - 100 mg/L)



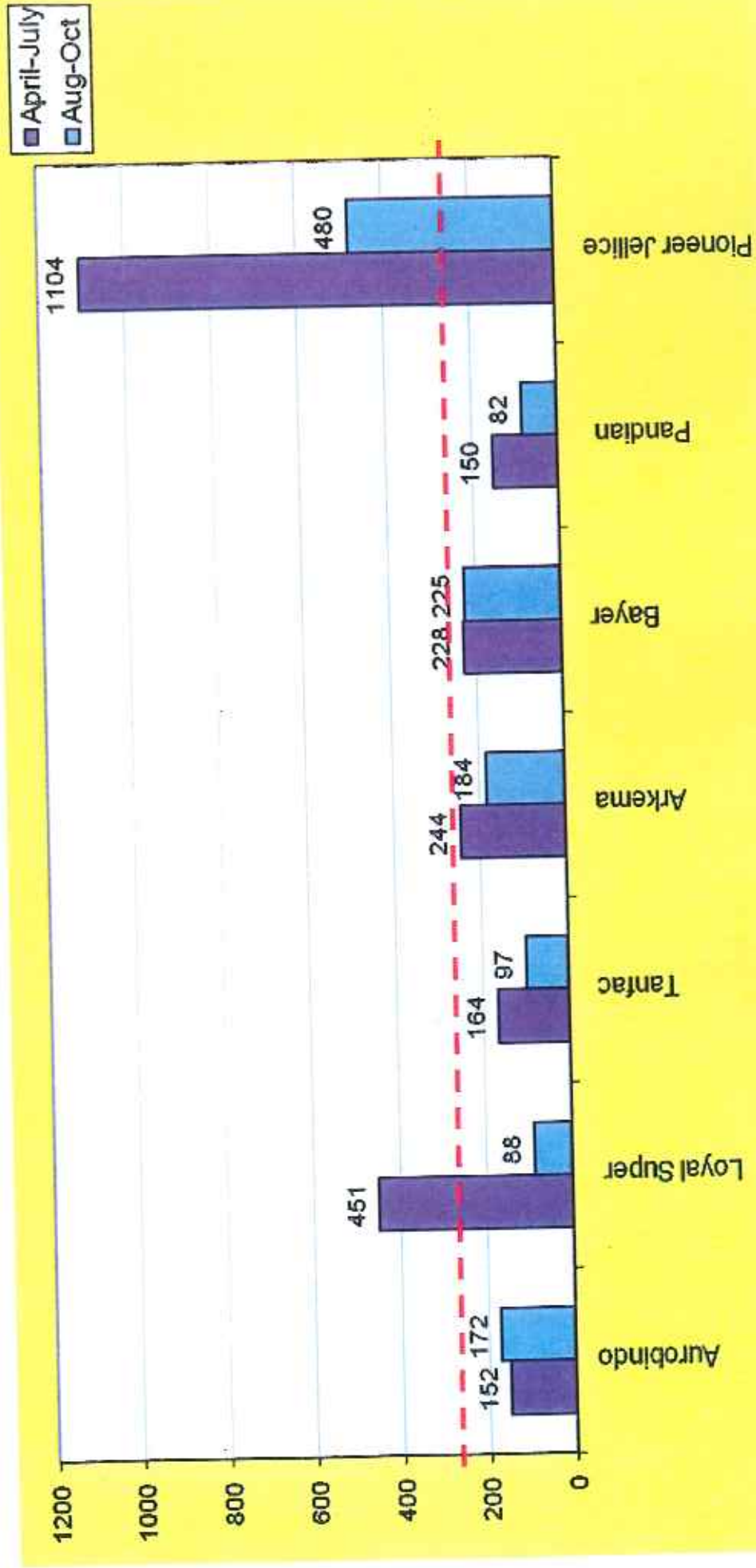
2010-2011

TREND CHART OF COD IN TREATED EFFLUENT (2009-10 & 2010-11) (Prescribed Limit for COD - 250 mg/L)



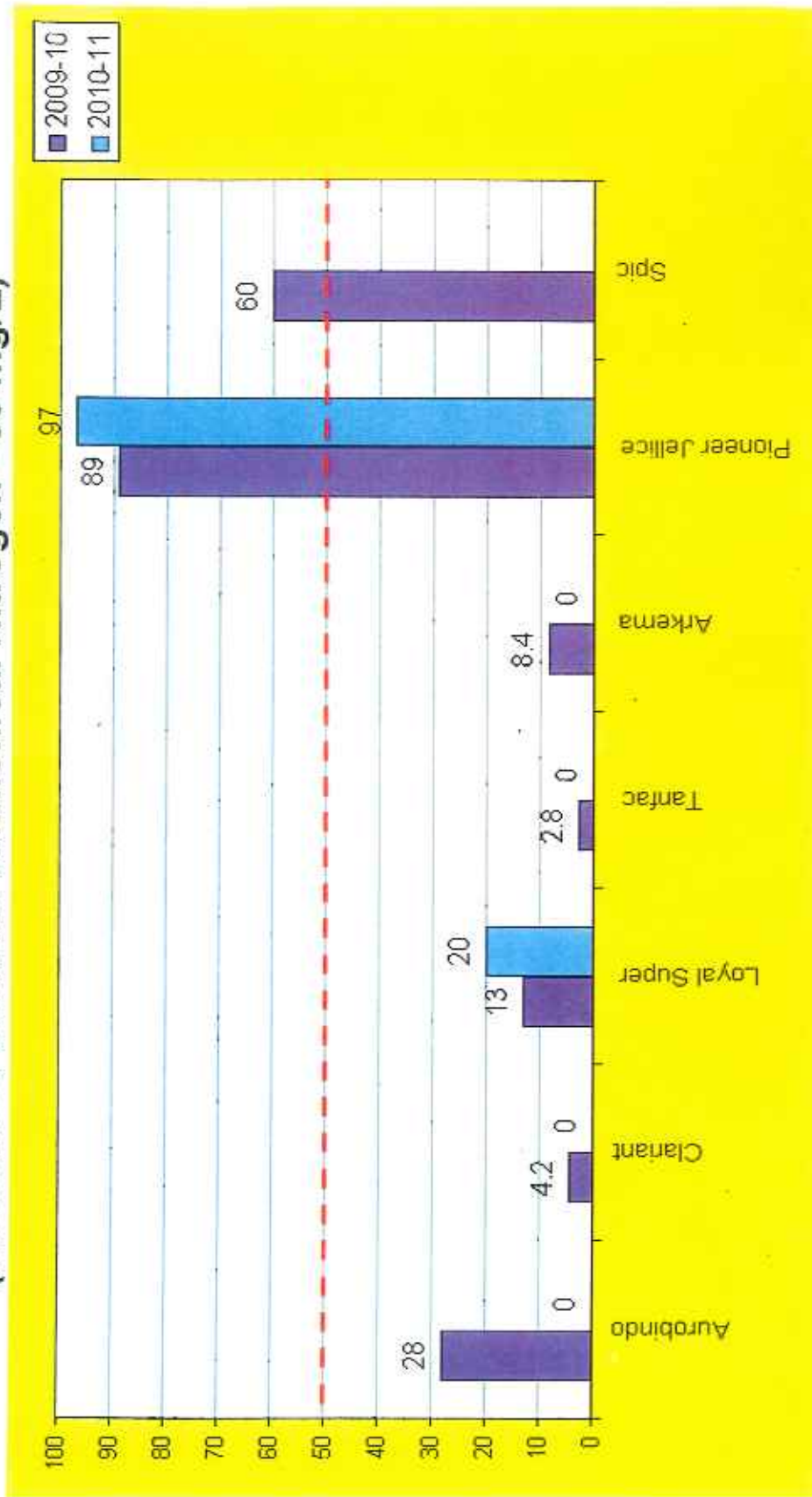
TREND CHART OF CUSECS MEMBER UNITS COD IN TREATED EFFLUENT

(Prescribed Limit for COD - 250 mg/L)



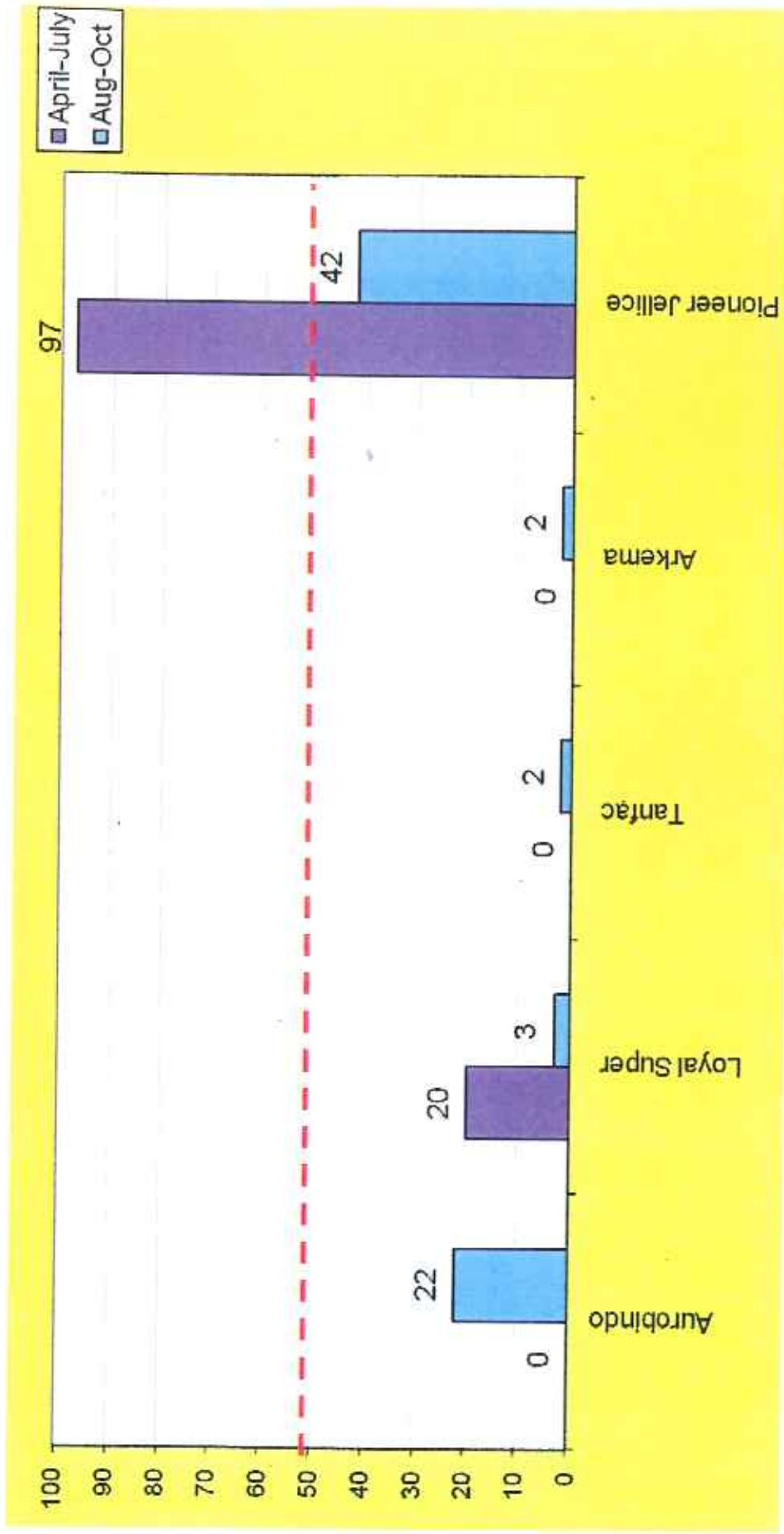
TREND CHART OF AMMONICAL NITROGEN IN TREATED EFFLUENT (2009-10 & 2010-11)

(Prescribed Limit for Ammonical Nitrogen - 50 mg/L)



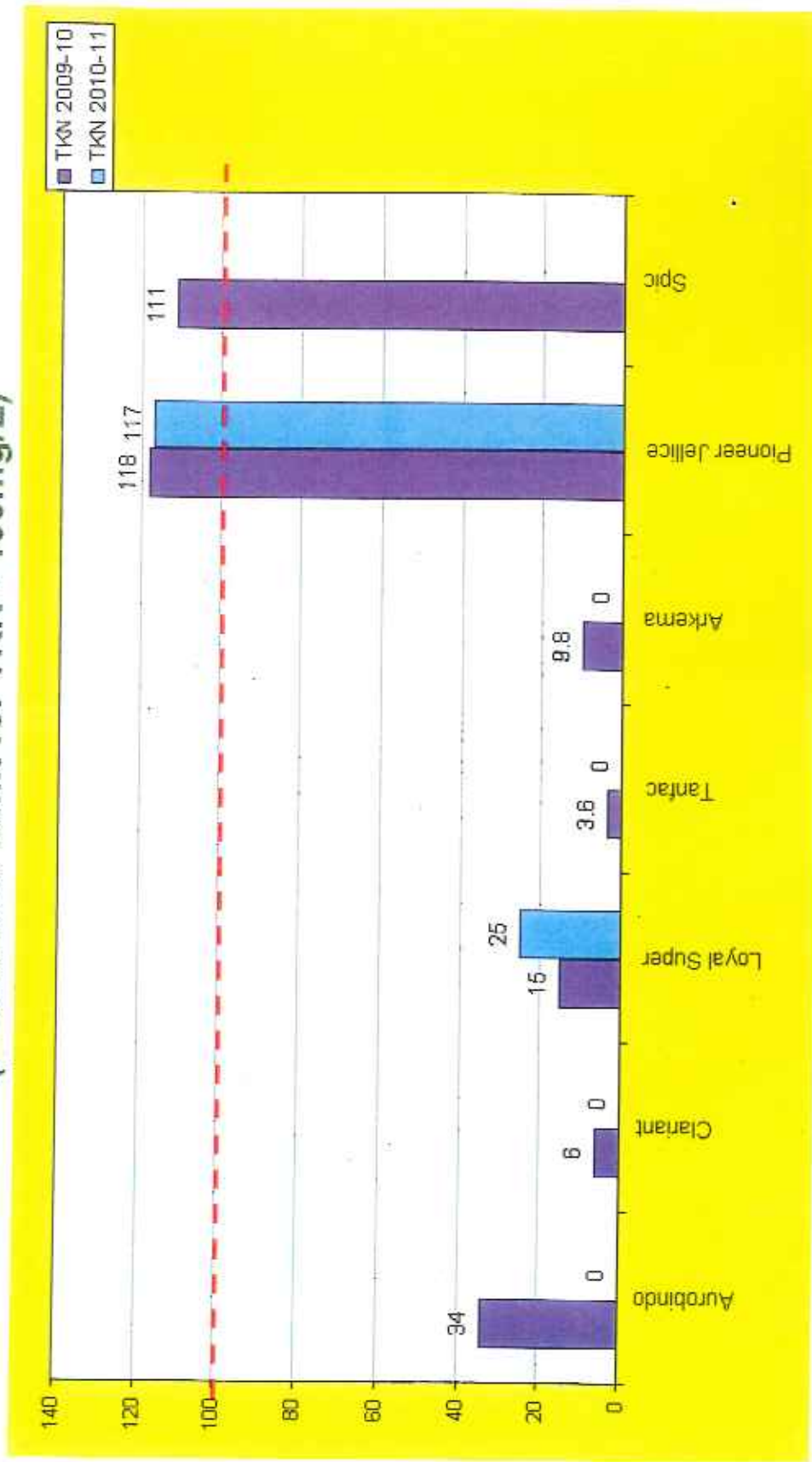
**TREND CHART OF CUSECS MEMBER UNITS
AMMONICAL NITROGEN IN TREATED EFFLUENT**

(Prescribed Limit for Ammonical Nitrogen - 50 mg/L)

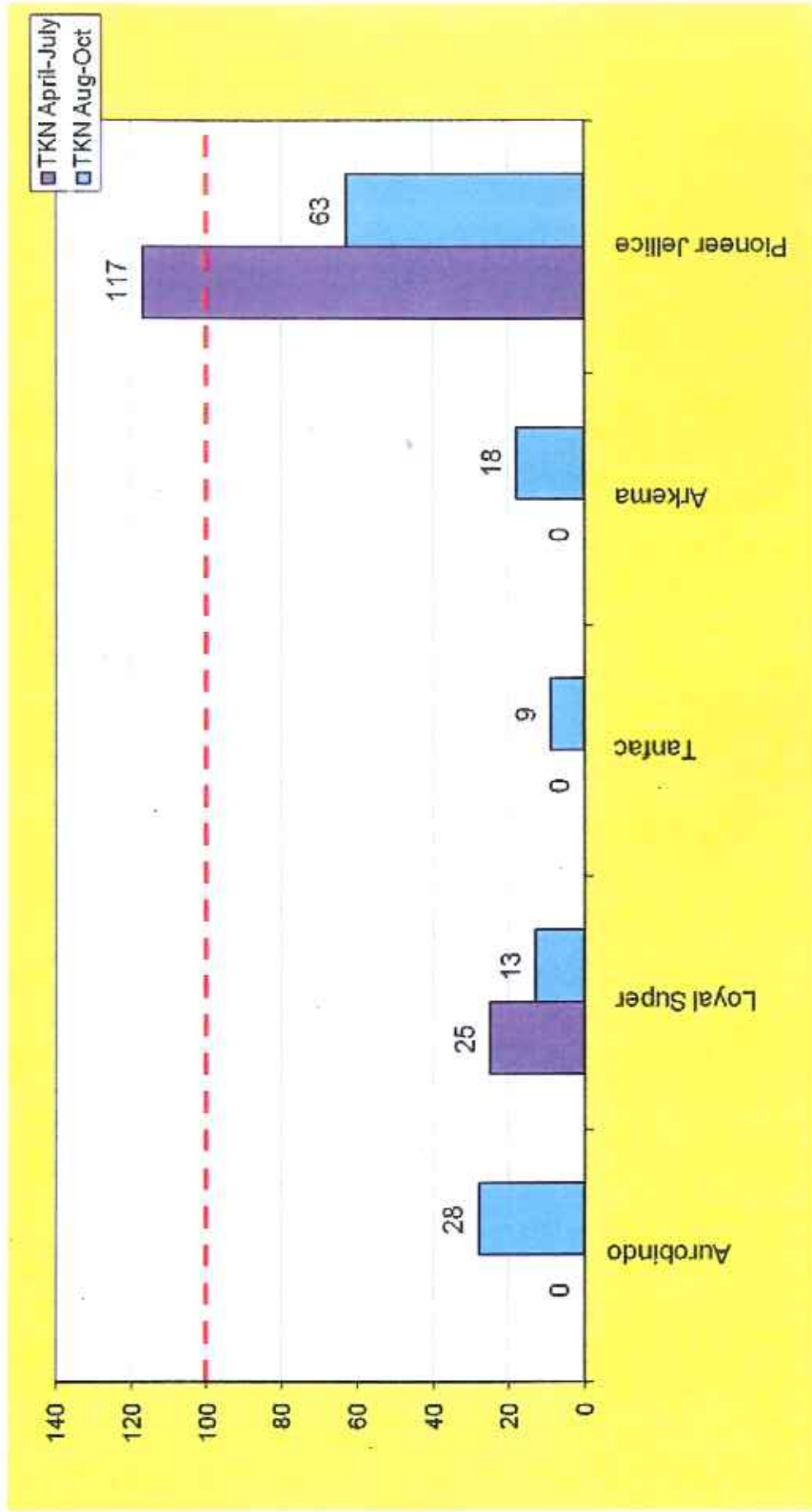


2010 - 2011

**TREND CHART OF TKN IN TREATED EFFLUENT
(2009-10 & 2010-11)
(Prescribed Limit for TKN - 100mg/L)**



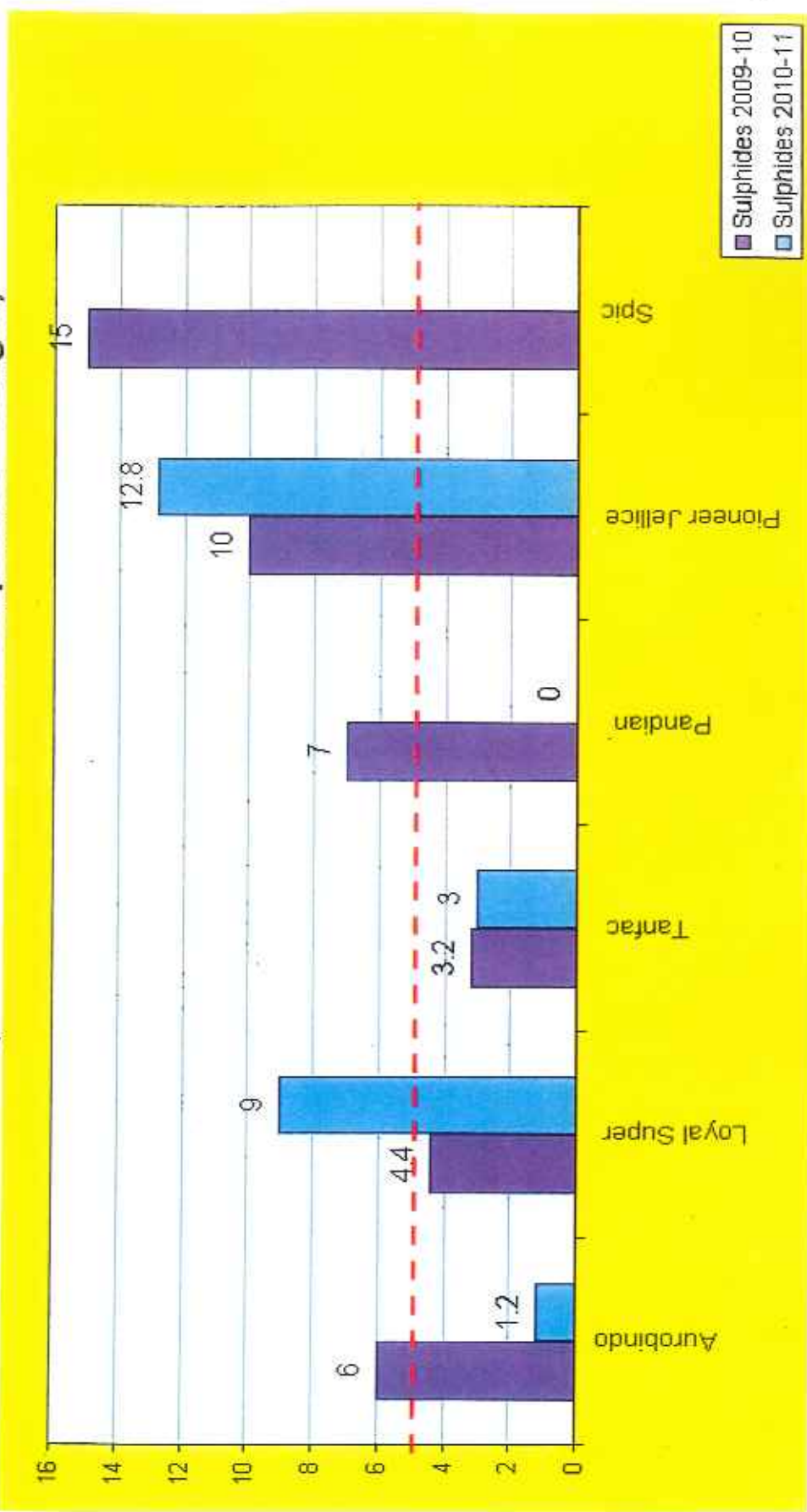
**TREND CHART OF CUSEC'S MEMBER UNITS
TKN IN TREATED EFFLUENT
(Prescribed Limit for TKN - 100mg/L)**



2010 - 2011

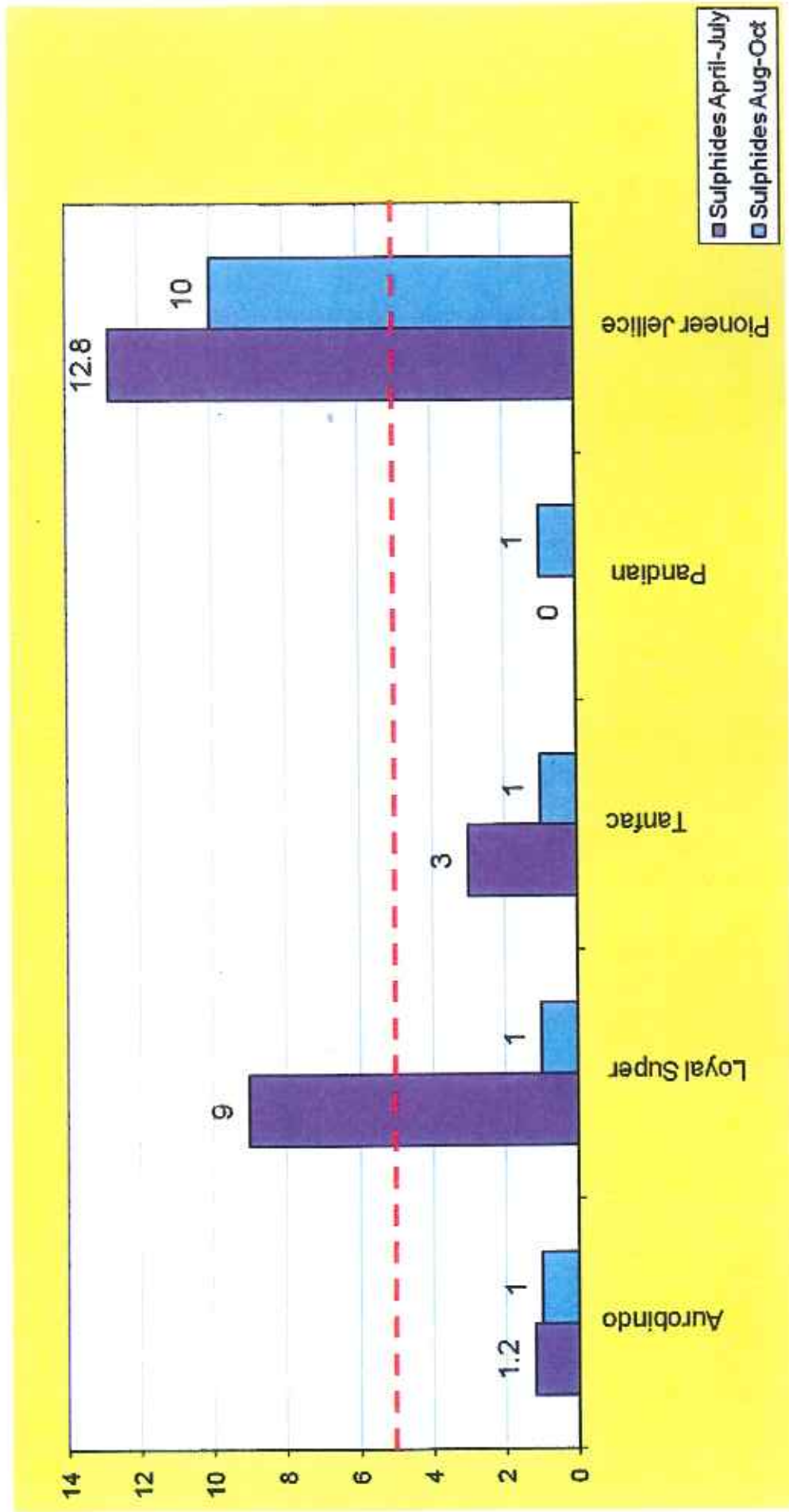
104

TREND CHART OF SULPHIDES IN TREATED EFFLUENT (2009-10 & 2010-11) (Prescribed Limit for Sulphides - 5 mg/L)



TREND CHART OF CUSECS MEMBER UNITS SULPHIDES IN TREATED EFFLUENT

(Prescribed Limit for Sulphides - 5 mg/L)

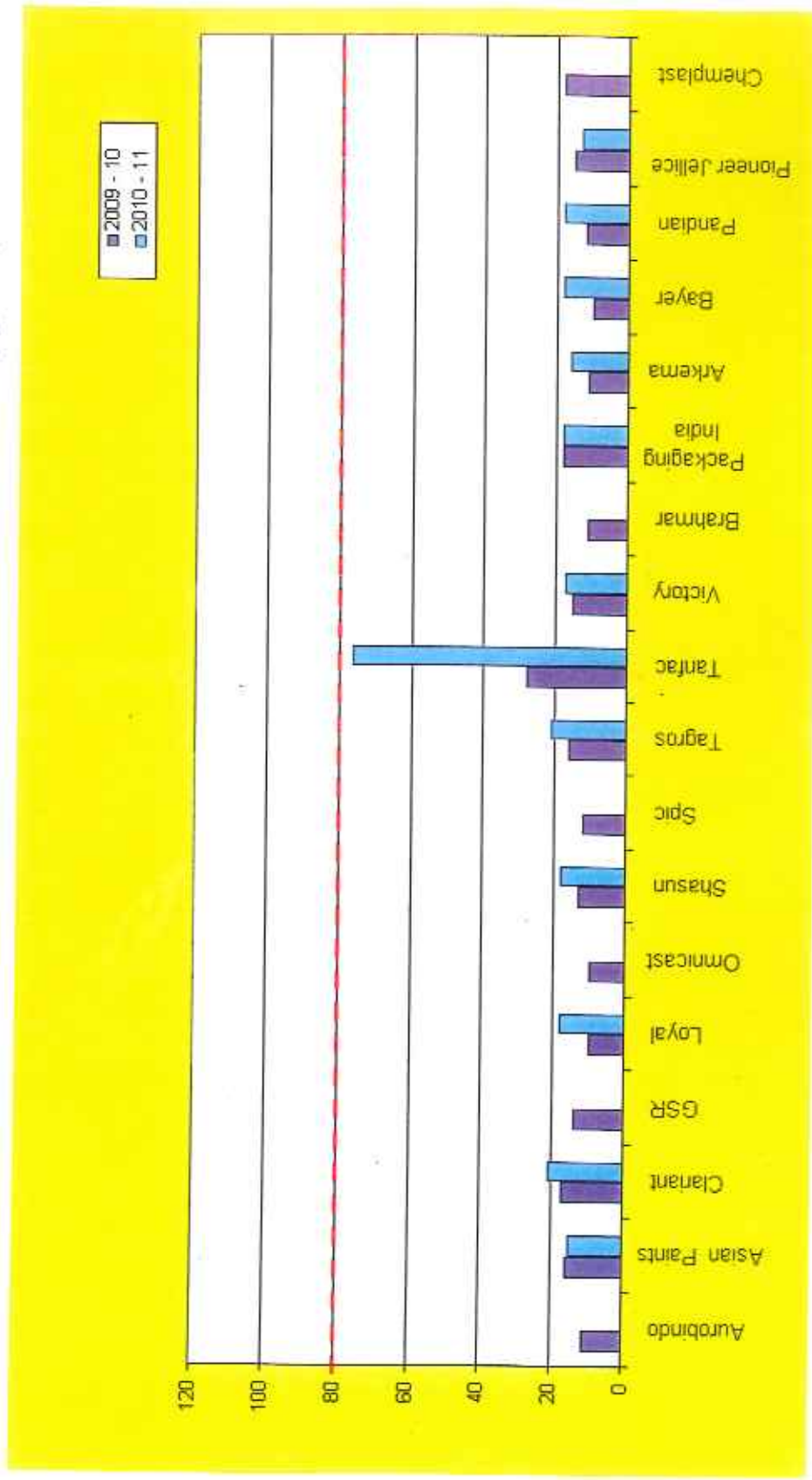


Ambient Air Quality Status of SIPCOT, Cuddalore

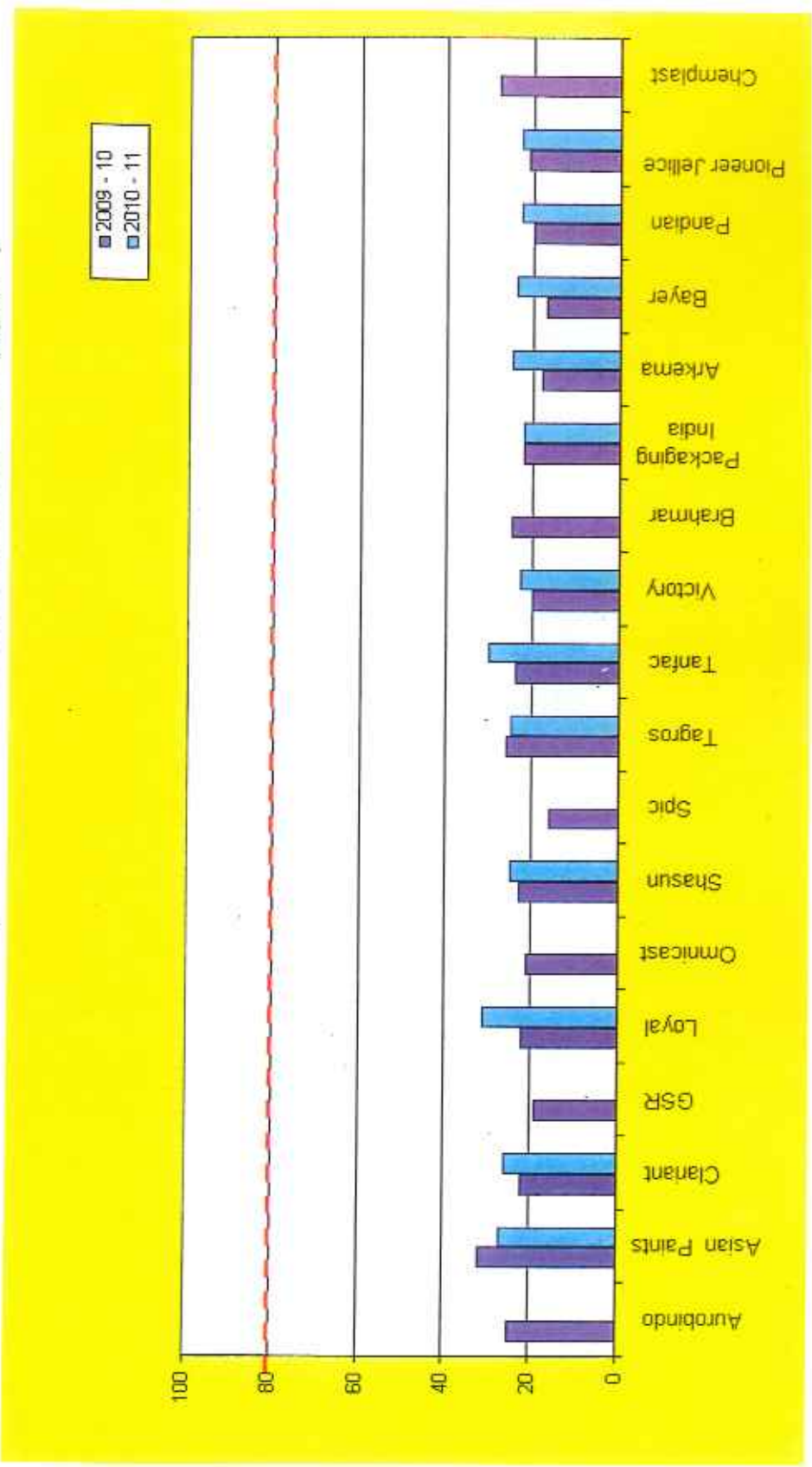
S.No	Name of Industry	SPM			SO ₂			No.			
		Standard 600 µg/m ³			Standard 80 µg/m ³			Standard 80 µg/m ³			
		2009 - 10	2010 - 11	2009 - 10	2009 - 10	2010 - 11	2009 - 10	2009 - 10	2010 - 11		
	PHASE - I										
01	Aurobindo Pharma Limited	140	136	11	15	25	20				
02	Asien Paints Limited	186	128	16	15	32	27				
03	Clariant Chemicals (I) Ltd	196	159	17	21	22	26				
04	GSR Products Limited	92	NA	14	NA	18	NA				
05	Loyal Super Fabrics	241	188	10	18	22	31				
06	Ornicast Precision Products Ltd	122	114	10	12	21	26				
07	Shasun Chemicals & Drugs Ltd	216	200	13	18	23	25				
08	Spic Pharma Division	132	NA	12	NA	16	NA				
09	Tagros Chemicals India Limited	155	169	16	21	26	25				
10	Tantac Industries Limited	360	182	28	76	24	30				
11	Victory Chemicals Ltd	312	312	15	17	20	23				
12	Brahmar Cellulose Products	162	NA	11	22.5	25	31.43				
13	Packaging India Limited	95	104	16	18	22	22				
14	Arkema Peroxides India Limited	86	114	11	16	18	25				
	PHASE - II										
15	Bayer Material Science Pvt. Ltd	141	168	10	16	17	24				
16	Pandian Chemicals Limited	175	146	12	18	20	23				
17	Pioneer Jellico (I) Pvt. Ltd	158	265	15	13	21	23				
18	Chemplast Sammar Ltd PVC Div.	140	160	18	20	28	21				

Note : The figures are the maximum values of each industry
 NA : Not Analyzed

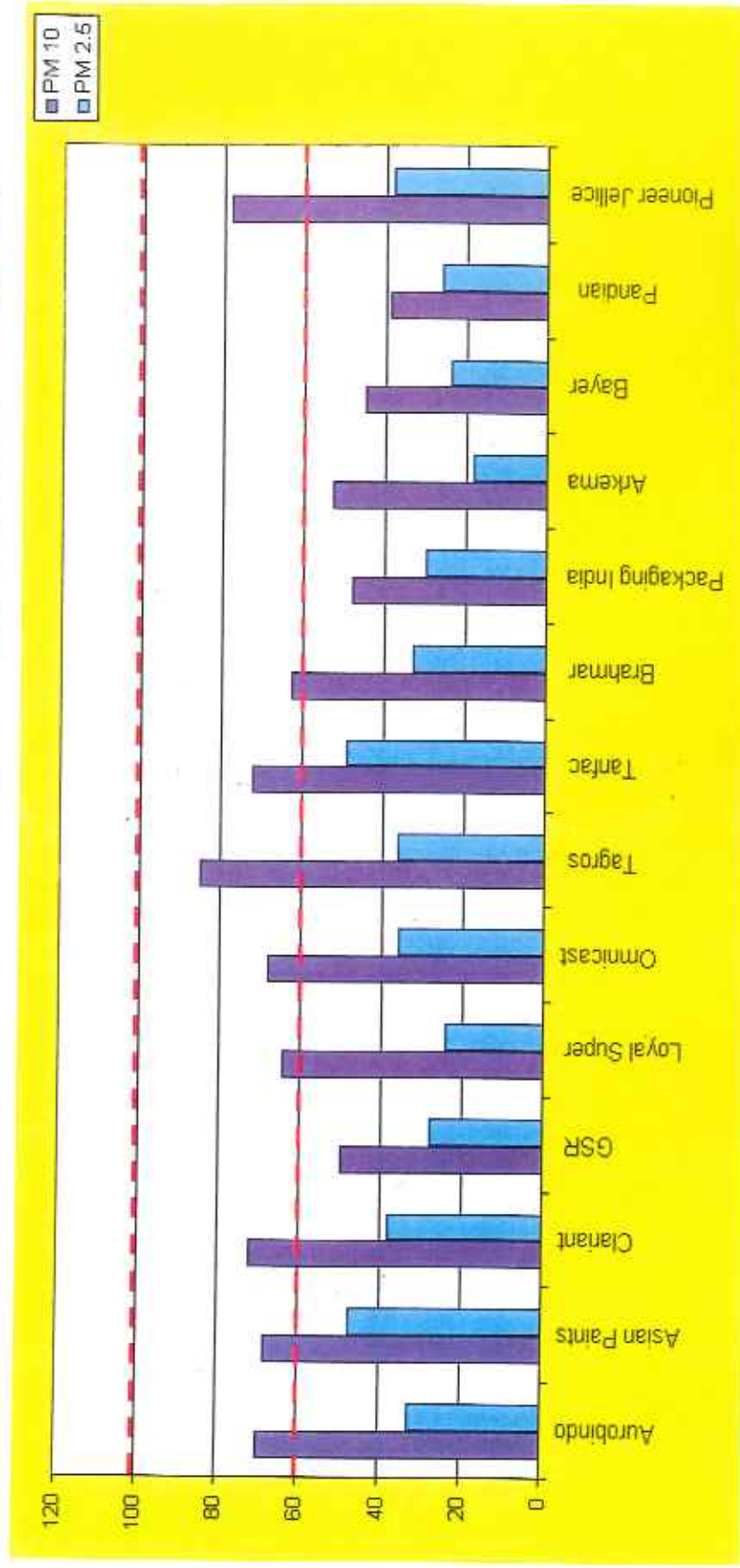
**TREND CHART OF SO₂ IN AMBIENT AIR (TNPCB REPORT)
(2009-10 & 2010-11)
(Prescribed Limit for SO₂ - 80 µg/M³)**



**TREND CHART OF NO_x IN AMBIENT AIR
(2009-10 & 2010-11)
(Prescribed Limit for NO_x - 80 µg/M³)**



**TREND CHART OF PM₁₀ & PM_{2.5} IN AMBIENT AIR
(2009-10 & 2010-11)**
(Prescribed Limit for PM₁₀ - 100 µg/m³ & PM_{2.5} - 60 µg/m³)



By MoE&F approved Lab

Ambient Air Quality Survey Report as done through MoEF approved Lab as per latest Notification

S. No.	Parameters	Units	Standards		CSR Products Ltd		Packaging India Ltd		Loyal Sayer Fabrics		Tigrise Chemicals (I) Ltd		Pioneer Jaline (I) Ltd		TANFAC Industries			
			Annual/24 hrs/8 hrs T/Sr	Annual/24 hrs/8 hrs T/Sr	13.05.10 & 29.06.10	09.06.10 & 10.06.10	07.06.10 & 08.06.10	03.06.10 & 04.06.10	10.05.10 & 11.06.10	10.05.10 & 11.05.10	26.05.2010 & 31.05.10	Down wind	Upwind	Down wind	Upwind	Down wind	Upwind	
1	Sulphur dioxide (SO ₂)	µ/m ³	50	80	19.5	15.8	14.3	16.58	24	18.84	18.5	21.7	22	22.74	BDL	BDL	6.59	7.09
2	Nitrogen Oxide (NO _x)	µ/m ³	40	80	45.67	50	22.6	28	40	35	28.1	45.4	49	50.52	BDL	BDL	21.7	21.6
3	Particulate matter PM ₁₀	µ/m ³	60	100	57	50	43	48	72	64	74	85	60	78	68.2	72	72	58
4	Particulate matter PM _{2.5}	µ/m ³	40	60	24.59	28	28	30	20.8	24	22.5	36.25	32.5	38	47.7	45	45	40.4
5	Ozone	µ/m ³	-	100	14.2	13.6	11	11	7	9.2	4	7	13	13.8	BDL	BDL	14	16
6	Lead (Pb)	µ/m ³	0.5	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.003	BDL	BDL	BDL
7	Benzene	µ/m ³	-	2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
8	Ammonia (NH ₃)	µ/m ³	100	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2.1	BDL	BDL	BDL	BDL	BDL	BDL
9	Carbon Monoxide (CO)	mg/m ³	-	3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
10	Nickel (Ni)	µg/m ³	20	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11	Benz[a]Pyrene (BaP)	ng/m ³	1	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12	Asbestos	mg/m ³	6	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Ambient Air Quality Survey Report as done through MoEF approved Lab as per latest Notification

S.No	Parameter	Unit	Standards		Sayer Kaiser Science Pvt Ltd		Aushika Pvt Ltd		Chinara Chemicals Pvt Ltd		Pandian Chemicals Pvt Ltd		Omikast Precision Essence		BIOGEMER CALICUP			
			24 hrs. & hrs	1 hr	04.08.10 & 01.06.10	04.08.10 & 01.06.10	04.08.10 & 01.06.10	04.08.10 & 01.06.10	04.08.10 & 01.06.10	04.08.10 & 01.06.10	04.08.10 & 01.06.10	04.08.10 & 01.06.10	04.08.10 & 01.06.10					
1	Sulphur dioxide (SO ₂)	µm ³	50	30	15.8	20.35	25	26.4	21.3	20.36	N.A	12	73.66	11.0	19	21.5	13.66	22.6
2	Nitrogen Oxide (NO _x)	µm ³	40	80	31.5	25	40	42.6	42.8	48	N.A	22	24.37	26	27	33.2	21	31.43
3	Particulate matter (PM ₁₀)	µm ³	60	100	40	45	58	70	67	72	N.A	38	48	63	60	68	43.48	82.70
4	Particulate matter (PM _{2.5})	µm ³	40	50	18.6	23.75	23	30	34	38	N.A	25	19	28	29	35	21.25	33
5	Ozone	µm ³		100	100	11.8	10.2	11	12.4	13.6	N.A	5	3	3.6	9	9.8	3	8
6	Lead (Pb)	µm ³	0.5	1	BDL	BDL	BDL	BDL	BDL	BDL	N.A	BDL	BDL	BDL	BDL	BDL	BDL	BDL
7	Benzene	µm ³		2	BDL	BDL	BDL	BDL	BDL	BDL	N.A	BDL	BDL	BDL	BDL	BDL	BDL	BDL
8	Ammonia (NH ₃)	µm ³	100	400	BDL	BDL	BDL	BDL	BDL	BDL	N.A	BDL	BDL	BDL	BDL	BDL	BDL	BDL
9	Carbon Monoxide (CO)	mg/m ³		2	4	4.2	4.2	4.2	4.2	4.2	N.A	5.2	4.2	4.2	4.2	4.2	4.2	4.2
10	Nickel (Ni)	ng/m ³	20		BDL	BDL	BDL	BDL	BDL	BDL	N.A	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11	Benzo(a)Pyrene (BaP)	ng/m ³			BDL	BDL	BDL	BDL	BDL	BDL	N.A	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12	Arsenic	ng/m ³	5		BDL	BDL	BDL	BDL	BDL	BDL	N.A	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Status of VOC level in the premises of M/s. Tagros Chemicals India Ltd & M/s. Shasun Chemicals and drugs Ltd., Cuddalore														
S.No	VOC	M/s. Tagros Chemicals India Ltd				M/s Shasun Chemicals and drugs Ltd								
		Vimta	SGS	VIMTA	SGS	17.04.08 & 18.04.08	27.06.08 & 24.09.08	23.09.08 & 24.09.08	23.10.09 & 24.10.09	SGS	SGS	SGS	SGS	
1	Acetone	ND	ND	7.2	ND	8.1	ND	ND	ND	ND	ND	ND	ND	7.09
2	Benzene	1.09	ND	12.3	32.267	11.1	ND	ND	ND	ND	ND	ND	ND	ND
3	Carbon tetra Chloride	ND	8.598	5.05	214.813	5.1	ND	ND	ND	ND	ND	ND	ND	ND
4	Chlorobenzene	ND	ND	10.5	23.279	8.3	ND	ND	ND	ND	ND	ND	ND	ND
5	Chloroform	ND	143.181	3.53	2.7	3.1	121.5	2733.5	161.67	220.33	12.9	1.48	ND	ND
6	Iso propyl Alcohol	ND	ND	4.2	ND	4.1	ND	ND	2169.06	1914.64	ND	ND	ND	ND
7	Hexane	ND	213.23	12.24	372.565	14.2	ND	ND	2762.99	2744.71	ND	7.47	ND	ND
8	Toluene	5.29	263.72	11.2	209.926	13.2	97.5	2468	809.73	801.67	17.54	10.13	ND	ND
9	Trichloro ethylene	ND	ND	7.3	ND	5.2	ND	ND	ND	ND	ND	ND	ND	ND
10	Dichloro methane	1.23	ND	12.22	ND	9.8	ND	ND	ND	ND	6.08	ND	ND	ND
11	Methylene Chloride	ND	ND	ND	ND	ND	1917	3503	1530	ND	ND	ND	ND	ND
12	Formaldehyde	ND	ND	ND	ND	ND	ND	ND	36.67	61.67	ND	36.61	ND	ND
13	Acetaldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14	Methanol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Note: All values are in microgram/m3

STATUS OF AMBIENT VOC LEVEL IN SIPCOT AREA

S.No	VOC	Targose				Dharant				Shasur			
		12.07.08	08.10.08	17.12.08	25.01.10	14.05.10	26.04.10	12.12.08	19.08.08	17.04.08 & 18.04.08	27.06.08	23.09.08 & 24.09.08	03.04.08 & 24.10.08
		SGS	SGS	SGS	VIMTA	SARGAM	SGS	SGS	SGS	SGS	SGS	SGS	SGS
1	Acetone	ND	ND	ND	7.2	8.1	ND	ND	ND	ND	ND	ND	ND
2	Benzene	1.09	ND	32.267	12.3	11.1	ND	68	10.1	ND	ND	ND	ND
3	Carbon tetra Chlori	ND	8.598	214.813	5.05	5.1	ND	ND	583.4	ND	ND	ND	ND
4	Chlorobenzene	ND	ND	23.279	10.5	8.3	ND	ND	10.4	ND	ND	ND	ND
5	Chloroform	ND	143.181	2.7	3.53	3.1	ND	ND	19.1	121.5	2733.5	161.67	220.33
6	iso propyl Alcohol	ND	ND	ND	4.2	4.1	ND	ND	ND	ND	ND	2169.06	1914.6
7	Hexane	ND	213.23	372.555	12.24	14.2	3300	ND	ND	ND	ND	2762.89	2744.7
8	Toluene	5.29	263.72	209.928	11.2	13.2	ND	ND	29.8	97.5	2468	808.73	801.57
9	Trichloro ethylene	ND	ND	ND	7.3	5.2	1000	ND	0.8	ND	ND	ND	ND
10	Dichloro methane	1.23	ND	ND	12.22	9.8	ND	ND	290.3	ND	ND	ND	ND
11	Methylene Chlorid	ND	ND	ND	ND	ND	ND	3492	ND	1917	3503	1530	ND
12	Formaldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	35.67	61.67
13	Acetaldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14	Methanol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

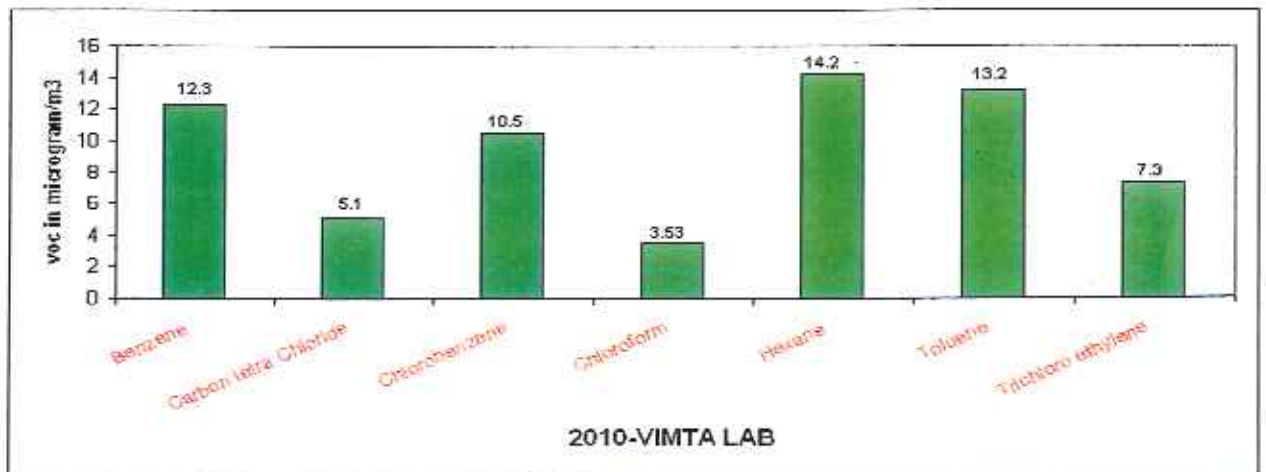
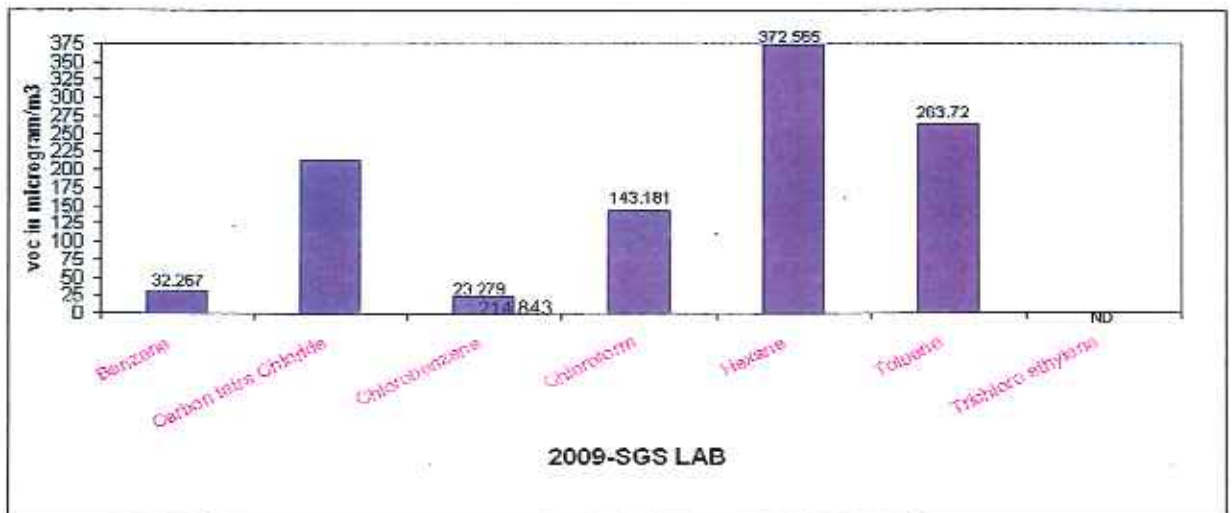
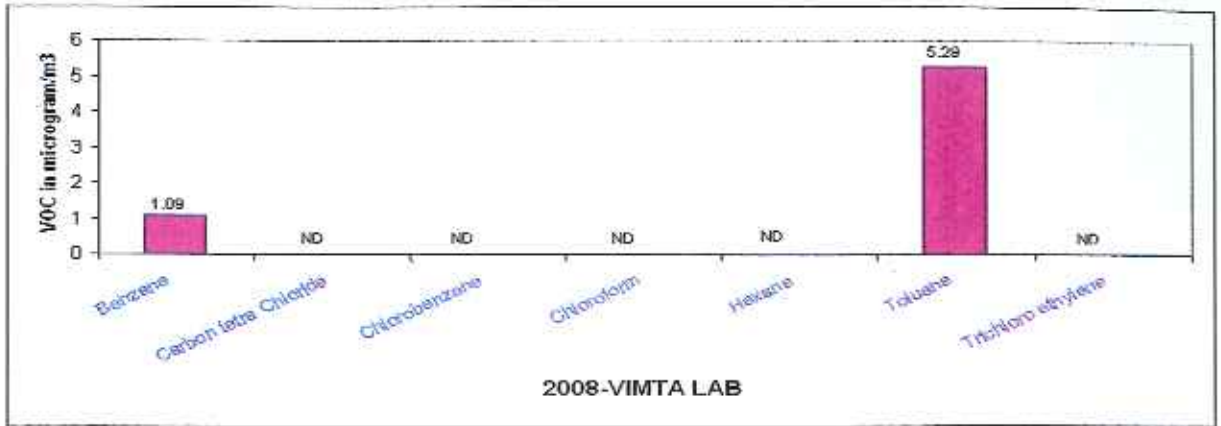
Note: All values are in microgram/m³

STATOS OF AMBIENT VOC LEVEL IN SIPCOT AREA

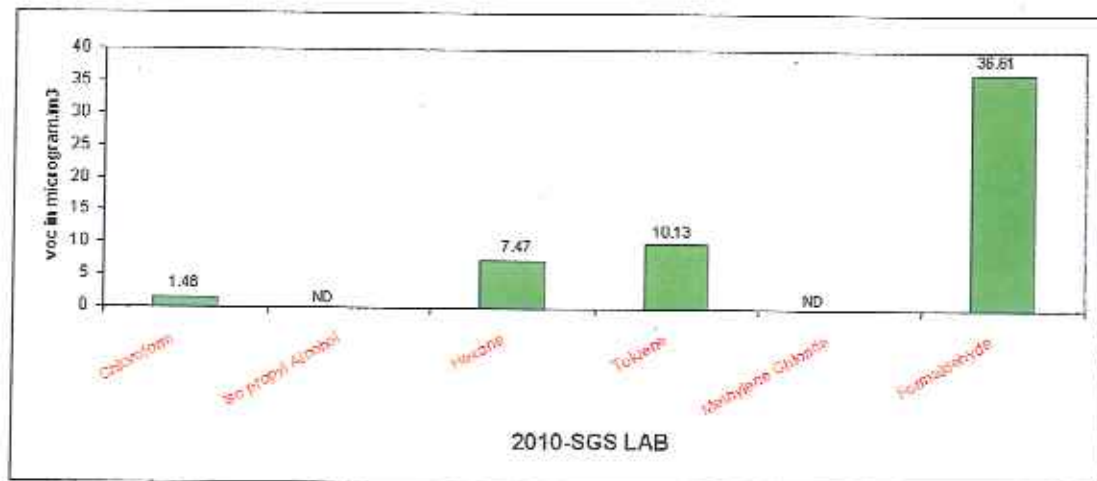
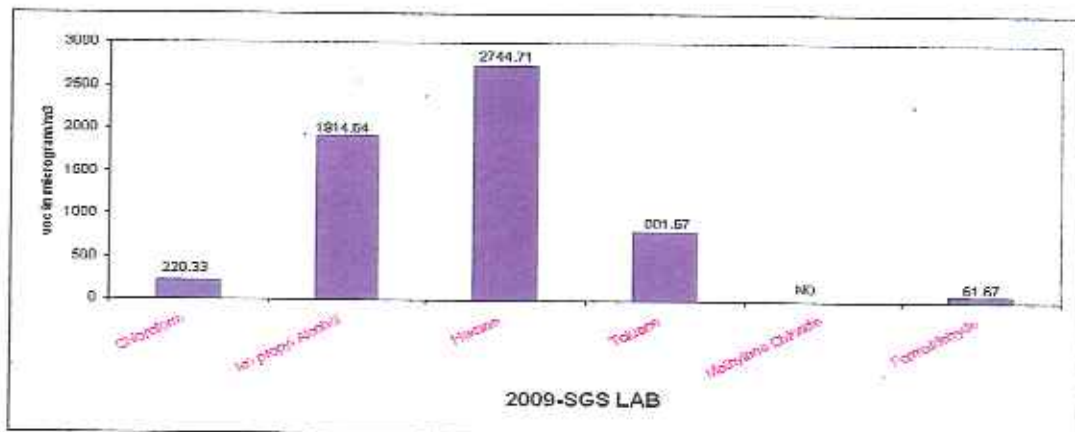
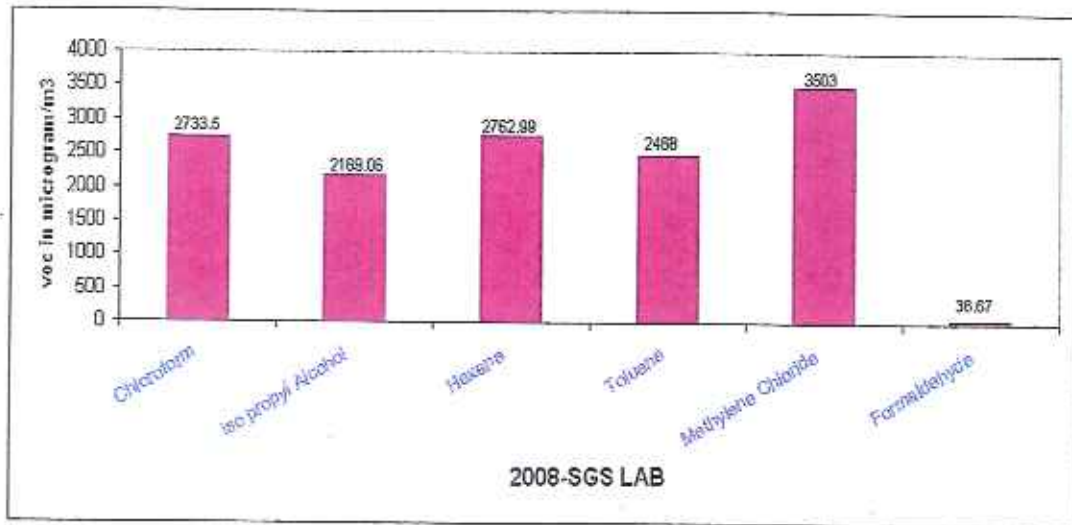
GSR	Asian Paints						SPIC	Chemplast	Arkema	Aurobindo
	10.11.08 & 11.1.08	11.05.09	17.09.09	20.05.10	06.05.10 & 06.05.10	05.02.08				
23.02.09	30.06.10	09.08.09	SGS	SGS	SGS	SGS	SGS	SARGAM	23.03.09	30.06.10
SGS	Sargam	SGS	SGS	SGS	SGS	SGS	SARGAM	SARGAM	SARGAM	sargam
ND	68.7	ND	ND	ND	ND	ND	18000	ND	ND	ND
16.97	ND	ND	ND	ND	ND	1.42	3600	0.18	ND	ND
ND	ND	ND	ND	ND	ND	NO	172250	ND	ND	ND
10.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20.82	87	ND	ND	ND	ND	ND	33000	ND	ND	ND
ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ND	296	ND	ND	ND	ND	1.63	12750	ND	ND	12.42
142.75	ND	ND	ND	ND	ND	2.61	3800	44	ND	ND
1.28	ND	ND	ND	ND	ND	ND	6800	ND	ND	ND
ND	120	ND	ND	ND	ND	ND	7760	220	ND	ND
ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ND	ND	2.7	6.43	ND	ND	ND	ND	ND	ND	ND
ND	ND	0.92	16.62	ND	ND	ND	ND	ND	ND	ND
ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Note: All values are in micrograms/m3

VOC level in ambient air in the premises of M/s.Tagros Chemicals (India) Ltd.



VOC level in ambient air in the premises of M/s. Shasun Chemicals & Drugs Ltd.



Soil Analysis Report as done by NGR, Hyderabad at SIPCOT, Cuddalore

Industry name	Pc	Total Cr	Cr (VI)	Na	K	Ca	Mg	Mn	Zn	Cu	Ni	Pb	Cd	Hg	As	[SO ₄] ²⁻ [Cl]	pH	
																		µg/ml
Arkema S1	2565	9.54	1.2	395	795	1917	500	41.64	12.35	4.22	5.96	0.46	0.22	11.52	1815	2052	1059	7.12
Arkema S2	1666	15.20	2.6	565	843	1726	475	86.40	28.52	4.10	7.55	4.06	0.12	BDL	795	1436	1089	6.94
Arkema S3	2618	9.51	0.3	303	640	1393	465	34.91	6.90	2.75	5.41	1.08	0.14	BDL	1329	1438	1243	7.05
Arkema S4	2578	7.86	1.1	236	418	703	513	28.48	5.21	1.76	4.47	0.86	0.14	BDL	522	1890	1114	6.43
Victory S5	2657	9.24	1.1	593	994	1905	494	48.40	11.79	6.68	10.15	1.24	0.23	0.06	907	2507	177	7.52
Victory S6	2819	13.29	1.6	3327	3818	6813	535	45.83	32.95	52.48	82.01	3.11	0.30	BDL	2689	821	860	6.78
Tantocit S7	3380	31.01	2.3	701	1290	2569	483	70.77	22.94	5.66	11.03	4.31	0.12	BDL	4493	1147	762	6.22
Chemplast S8	2406	7.20	0.7	185	386	600	255	11.59	6.74	1.42	2.51	0.18	0.08	15.10	1166	1561	354	6.74
Chemplast S9	442	13.18	0.4	202	870	997	482	64.90	8.35	2.33	6.98	1.02	0.12	BDL	739	2751	530	6.12
Chemplast S10	3178	7.79	1.2	208	334	318	422	31.97	9.10	2.52	3.68	1.63	0.14	13.34	670	2785	524	6.07
Chemplast S11	1539	4.42	0.3	243	311	1831	425	12.93	4.64	1.13	3.42	0.70	0.16	2.57	1250	2131	705	7.84
Chemplast S12	2678	10.22	0.2	272	695	1128	477	26.15	8.25	1.79	5.68	0.80	0.16	15.92	2144	1930	177	7.36
Chemplast S13	3193	10.12	0.8	197	612	954	499	50.31	4.91	2.01	5.01	BDL	0.22	BDL	1787	6740	707	7.51
Chemplast S14	2852	14.01	0.8	222	932	1223	481	69.55	1.98	1.96	7.50	2.96	1.39	2.68	1095	1022	703	6.51
Chemplast S15	3087	13.87	1.2	212	896	947	485	86.08	6.61	2.43	5.74	0.24	0.12	BDL	886	17036	1039	6.99
Chemplast S16	2645	8.06	1.4	504	1133	4884	539	32.09	7.80	3.42	6.18	0.02	0.22	BDL	2603	2610	1218	7.80
Chemplast S17	2297	7.62	0.5	223	451	864	418	14.57	7.64	2.17	4.72	1.49	0.18	BDL	1924	3649	1064	7.29
Chemplast S18	2272	7.78	0.6	221	392	973	409	18.53	5.79	1.30	4.52	0.38	0.21	15.74	2151	6877	1301	4.30
Chemplast S19	2990	14.11	2.1	217	1042	1709	501	63.54	11.20	4.16	6.44	BDL	0.18	BDL	2149	9114	706	7.52
Chemplast S20	2432	8.24	1.6	267	467	963	455	20.37	6.37	1.75	4.30	0.80	0.14	24.03	2334	8244	706	7.07
Chemplast S21	2294	6.96	1.2	213	401	789	435	17.75	6.09	1.72	4.07	0.22	0.24	19.98	2291	5026	703	5.18
Chemplast S22	3210	21.05	3.5	233	1308	2307	501	47.98	12.03	6.16	6.60	BDL	0.16	BDL	2397	7800	351	7.79
Chemplast S23	2600	9.38	0.9	207	692	1249	474	31.35	8.72	2.18	3.79	0.83	0.18	6.64	2340	12417	1054	7.05
Bayer S24	3008	16.61	1.7	265	724	1929	443	88.38	8.24	4.34	4.30	2.09	0.34	19.66	1380	4098	353	6.52
Bayer S25	2842	13.78	1.6	337	808	2825	471	48.03	8.90	4.30	5.00	1.27	0.32	29.90	1123	5129	1178	6.74
Bayer S26	2393	8.30	0.7	343	625	2477	483	31.68	5.64	2.38	3.73	1.61	0.28	22.19	2004	2458	1008	7.42
Bayer S27	2985	15.67	0.9	264	583	2121	395	81.24	8.00	3.51	4.71	1.60	0.28	10.42	1754	3550	702	6.74
Bayer S28	2000	7.80	0.2	362	367	2269	425	23.33	4.75	2.06	2.81	1.09	0.36	39.23	1559	4361	701	7.15
Bayer S29	3108	21.16	0.3	292	625	2000	424	52.63	8.45	3.06	4.39	5.52	0.24	15.25	1282	2233	1057	6.66
Bayer S30	3100	21.16	1.7	330	635	1909	450	59.91	8.64	3.39	3.84	1.99	0.30	30.43	679	1846	706	6.37
Bayer S31	2790	14.05	1.2	631	712	2795	475	44.70	11.59	4.60	4.63	1.50	0.34	27.16	2453	9269	610	7.31
Bayer S32	1320	3.79	0.2	1632	587	7416	494	21.96	5.12	2.05	3.19	0.43	0.35	45.80	888	1370	347	6.77

Table 12 Chemical Analysis of soil samples drawn from different locations (Jan-2008) in and around SIPCOT, Cuddalore.

GROUND WATER MONITORING

YEAR : 2009 & 2010

STATEMENT OF REPORT OF ANALYSIS OF SPIC BORE WELL

Sl. No	Parameters	Drinking water standards (Max limits)	2009					2010			Range
			Jan 2009	Feb 2009	June 2009	Sep 2009	Dec 2009	Range	March 2010	June 2010	
1	PH	6.5 - 8.5	7.62	7.30	7.63	6.85	6.26	6.51 - 7.57	6.54	7.09	6.54 - 7.09
2	TDS	500	2180	1680	576	552	1182	384 - 896	672	936	672 - 936
3	Chlorides	250	80	95	115	100	58 - 80	90	140	90 - 140	
4	Total Iron	0.3	0.9	0.2	0.6	7.7	0.3 - 1.4	0.5	12	0.5 - 12	
5	Fluorides	1	0.78	0.95	0.17	0.45	0.02 - 0.65	0.35	0.75	0.35 - 0.75	
6	Phenolic Compounds	0.001	<MDL	<MDL	<MDL	<MDL	BDL	<MDL	<MDL	<MDL	
7	Lead	0.05	<MDL	<MDL	0.02	<MDL	BDL	BDL	0.2	<MDL	
8	Zinc	5	0.8	0.7	0.04	2.8	BDL - 0.7	0.1	0.8	0.1 - 0.8	
9	Total Chromium	0.05	<MDL	<MDL	<MDL	<MDL	BDL	<MDL	<MDL	<MDL	
10	Total Hardness	300	934	816	176	616	156 - 264	164	420	164 - 420	
11	Magnesium	30	182	68	17	4	5 - 47.1	15	25	15 - 25	
12	Cadmium	0.01	<MDL	<MDL	<MDL	<MDL	BDL	0.03	<MDL	<MDL - 0.03	
13	Calcium	75	74	-	42	240	28 - 54	42	126	42 - 126	

All the unit except pH expressed in mg/L.

GROUND WATER MONITORING

STATEMENT OF REPORT OF ANALYSIS OF KUDIKA DU OHT YEAR : 2009 & 2010

Sl. No	Parameters	Drinking water standards (Max limits)	2009					2010			
			Jan 2009	Feb 2009	June 2009	Oct 2010	Dec 2009	Range	March 2010	June 2010	Range
1	PH	6.5 - 8.5	7.57	7.45	7.45	6.51	6.48	6.51 - 7.57	6.58	6.97	6.58 - 6.79
2	TDS	500	692	896	528	384	416	384 - 896	764	672	672 - 764
3	Chlorides	250	58	70	80	66	60	58 - 80	110	80	80 - 110
4	Total Iron	0.3	0.5	1.4	0.3	0.34	0.4	0.3 - 1.4	1.1	0.1	0.1 - 1.1
5	Fluorides	1	0.65	0.02	0.45	0.492	0.1	0.02 - 0.65	0.4	0.4	0.4 - 0.4
6	Phenolic Compounds	0.001	<MDL	<MDL	<MDL	<MDL	<MDL	BDL	<MDL	<MDL	<MDL
7	Lead	0.05	<MDL	<MDL	<MDL	<MDL	<MDL	BDL	0.1	<MDL	<MDL - 0.1
8	Zinc	5	0.01	0.01	<MDL	0.02	0.7	BDL - 0.7	0.8	<MDL	<MDL - 0.8
9	Total Chromium	0.05	<MDL	<MDL	<MDL	<MDL	<MDL	BDL	<MDL	<MDL	<MDL
10	Total Hardness	300	256	264	156	168	220	156 - 264	360	192	192 - 360
11	Magnesium	30	47.1	21	5	21	42	5 - 47.1	45	24	24 - 45
12	Cadmium	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	BDL	<MDL	<MDL	<MDL
13	Calcium	75	-	-	54	32	28	28 - 54	70	37	37 - 70

All the unit except pH expressed in mg/L.

GROUND WATER MONITORING

STATEMENT OF REPORT OF ANALYSIS OF SATHYA HAND PUMP YEAR : 2009 & 2010

Sl. No	Parameters	Drinking water standards (Max limits)	2009			2010			Range
			Jan 2009	Feb 2009	Range	March 2010	June 2010	Range	
1	PH	6.5 - 8.5	6.66	6.15	6.15 - 6.66	4.03	6.33	4.03 - 6.33	
2	TDS	500	1376	1200	1200 - 1376	580	264	264 - 580	
3	Chlorides	250	100	60	60 - 100	70	40	40 - 70	
4	Total Iron	0.3	0.9	0.4	0.4 - 0.9	1.3	2	1.3 - 2	
5	Fluorides	1	0.65	0.38	0.38 - 0.65	0.45	0.45	0.45 - 0.45	
6	Phenolic Compounds	0.001	<MDL	<MDL	BDL	<MDL	<MDL	<MDL	
7	Lead	0.05	<MDL	<MDL	BDL	0.3	<MDL	<MDL - 0.3	
8	Zinc	5	0.05	0.05	0.05	0.2	<MDL	<MDL - 0.2	
9	Total Chromium	0.05	<MDL	<MDL	BDL	<MDL	<MDL	<MDL	
10	Total Hardness	300	616	600	600 - 616	380	124	124 - 380	
11	Magnesium	30	127	56	56 - 127	39	17	17 - 39	
12	Cadmium	0.01	<MDL	<MDL	BDL	0.01	<MDL	<MDL - 0.01	
13	Calcium	75	-	-	-	86	21	21 - 86	

All the unit except pH expressed in mg/L.

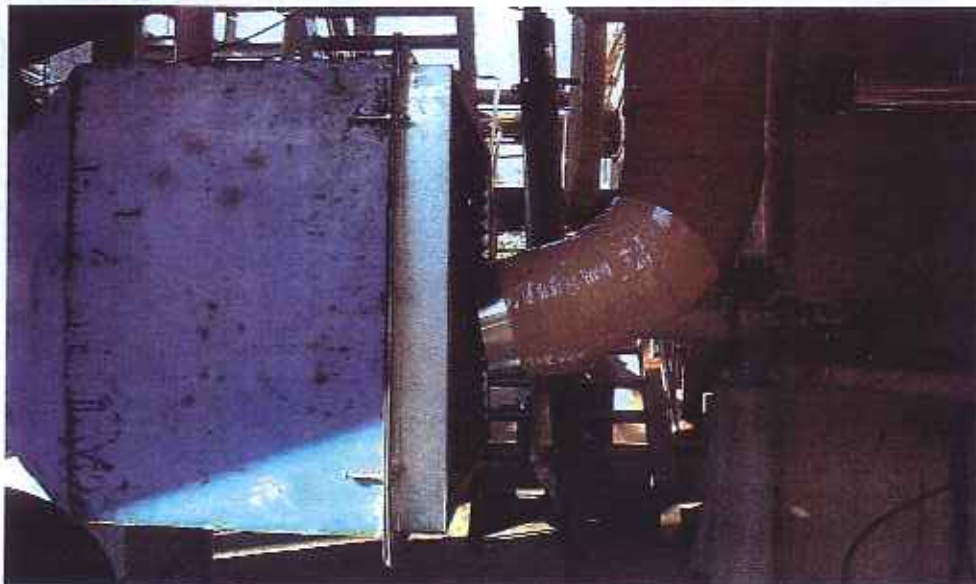
**Photographs showing the implementation of the
improvement measures done by the Industries**

ASIAN PAINTS LTD
To reduce VOC

**FORMALDEHYDE VENT CONNECTED TO SUCTION OF
THE BLOWER AND THE VAPOURS ARE RECYCLE BACK
INTO THE PROCESS**



Formaldehyde Storage tank Farm

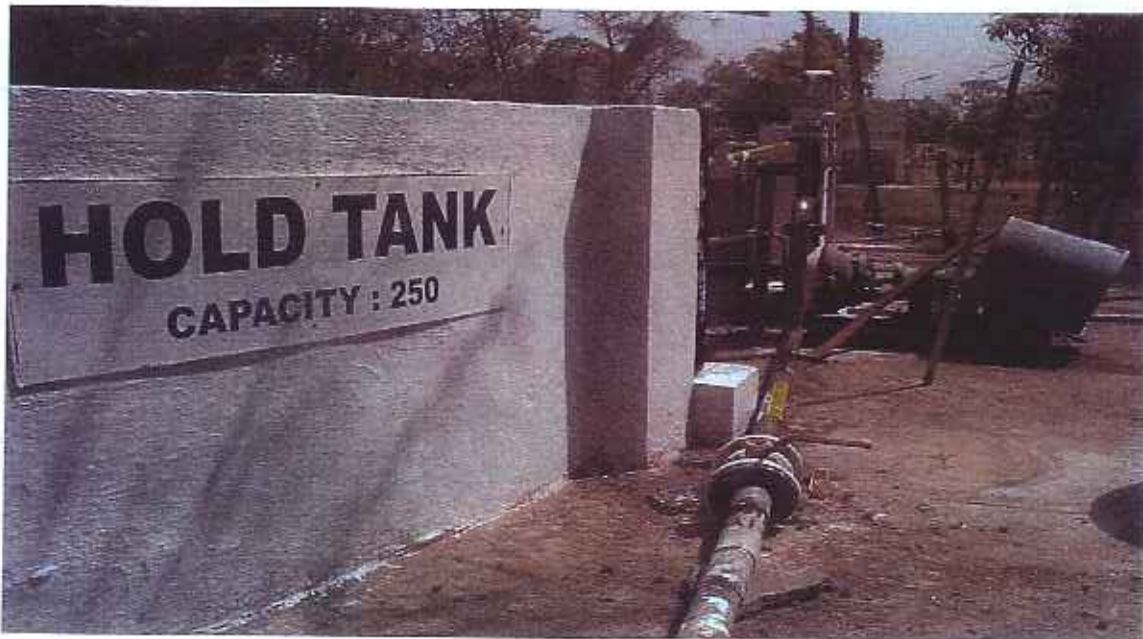


Storage tanks vents connected to blower

ARKEMA PEROXIDES

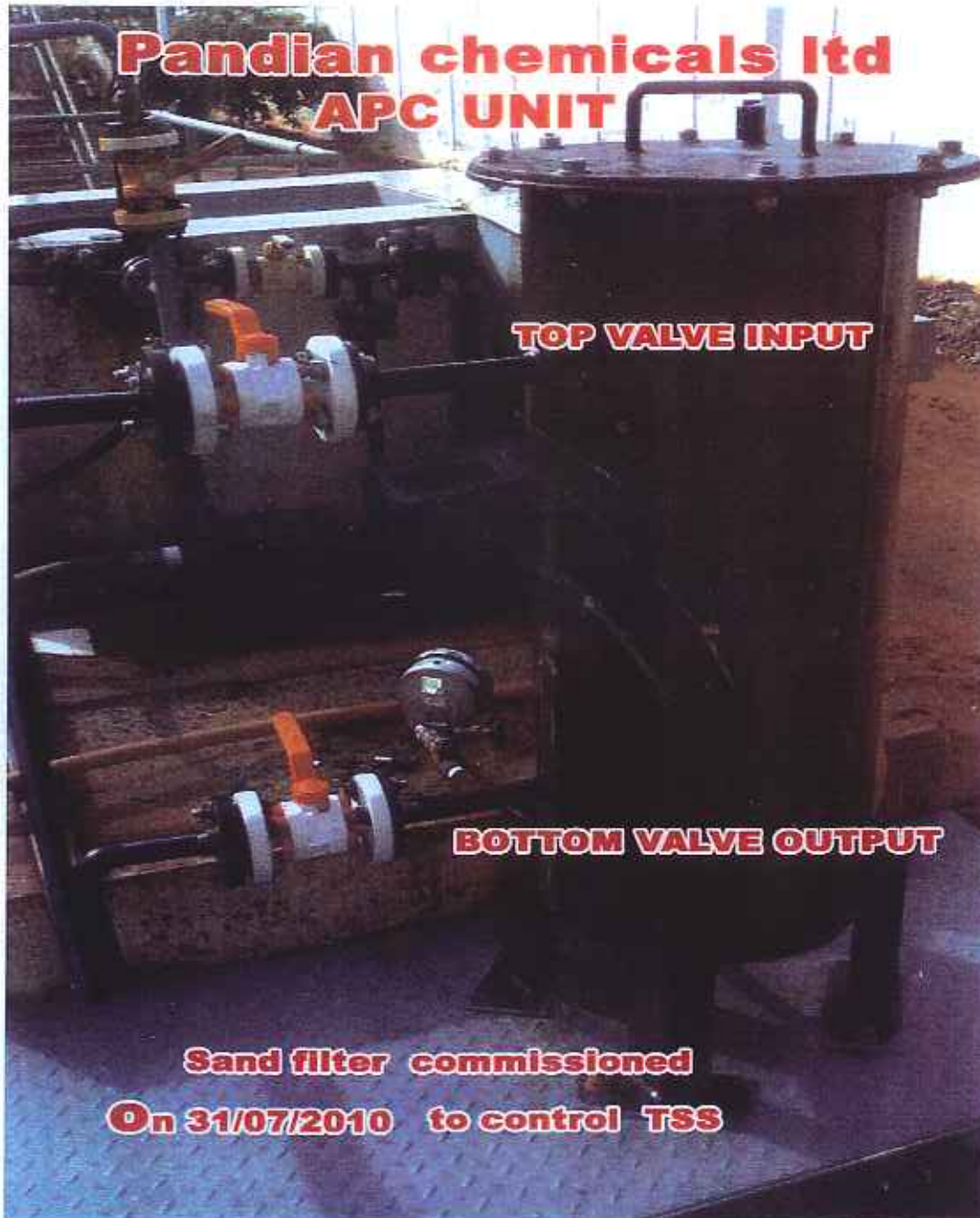


SAND FILTER – To Remove TSS



SEGREGATION OF SULPHATE EFFLUENT &
Regulated flow to ETP to avoid shock loading

PANDIAN CHEMICALS

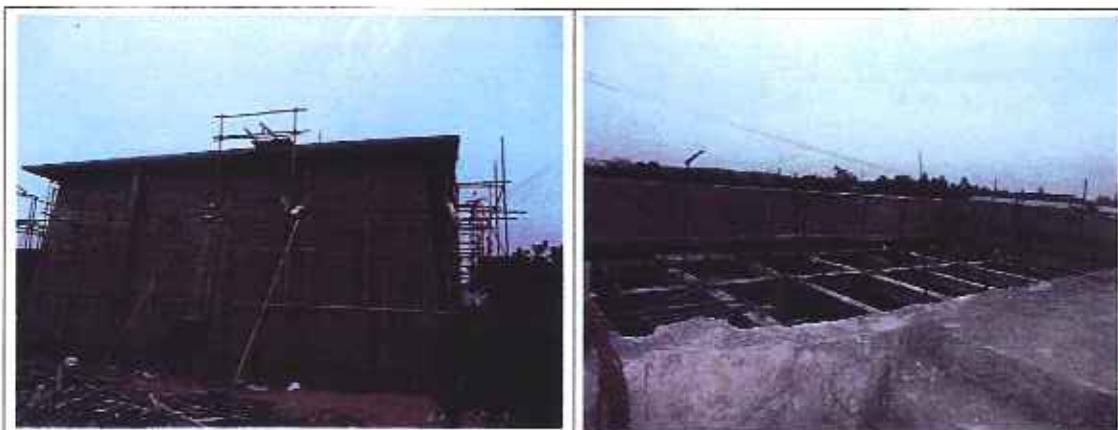


SAND FILTER – TO REDUCE TSS

Pioneer Jellice India Private Limited
Progress of Construction:(Previous Stage)



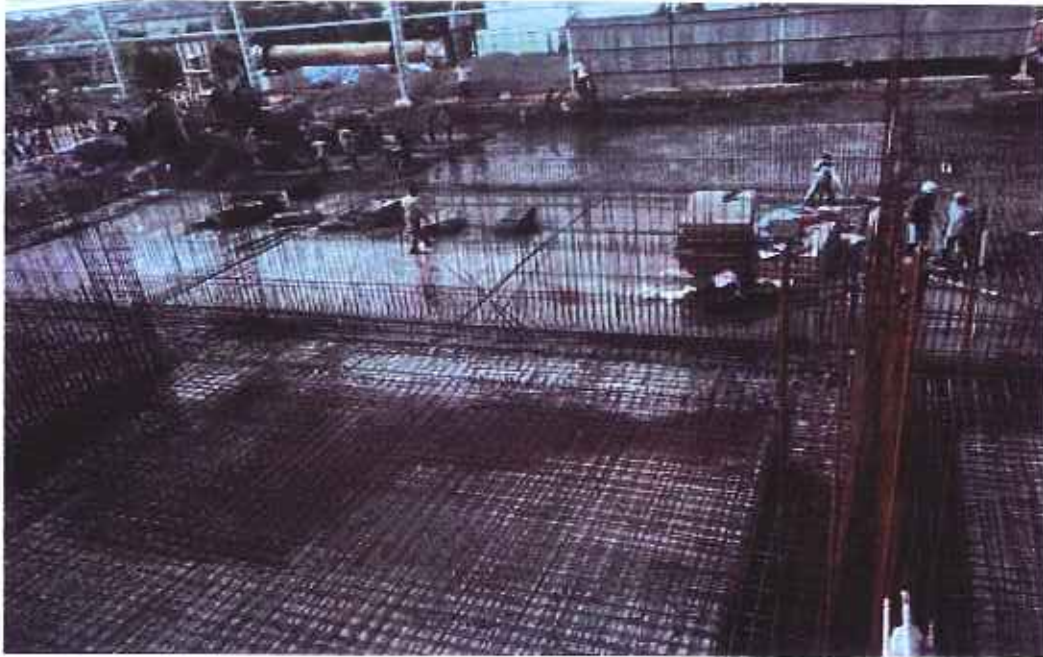
TO REDUCE BOD/COD – UASBR PROPOSED



LATEST STAGE

100% Civil work Completed. Fabrication & erection of Gas – Liquid – Solid – Separator is in progress. The Biological stabilisation will be commenced after completion of erection by middle of January 2011.

Progress of Construction :(Previous Stage)



NITRIFICATION /DENITRIFICATION AERATION TANK
To reduce TKN & Ammoniacal nitrogen



LATEST STAGE

100% Civil work has been completed. Erection of Diffused Aeration Equipment has been completed using 520 numbers of 12" Diameter Diffuser Discs. Activated Sludge has been inoculated. Biological stabilisation process is in progress.



CLARIFIER (Previous Stage)
To reduce TSS

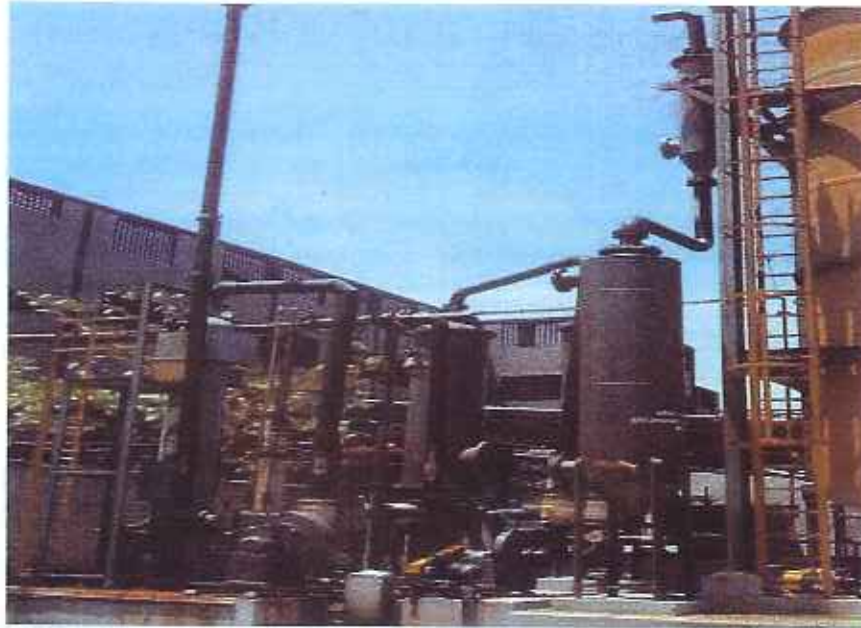


LATEST STAGE

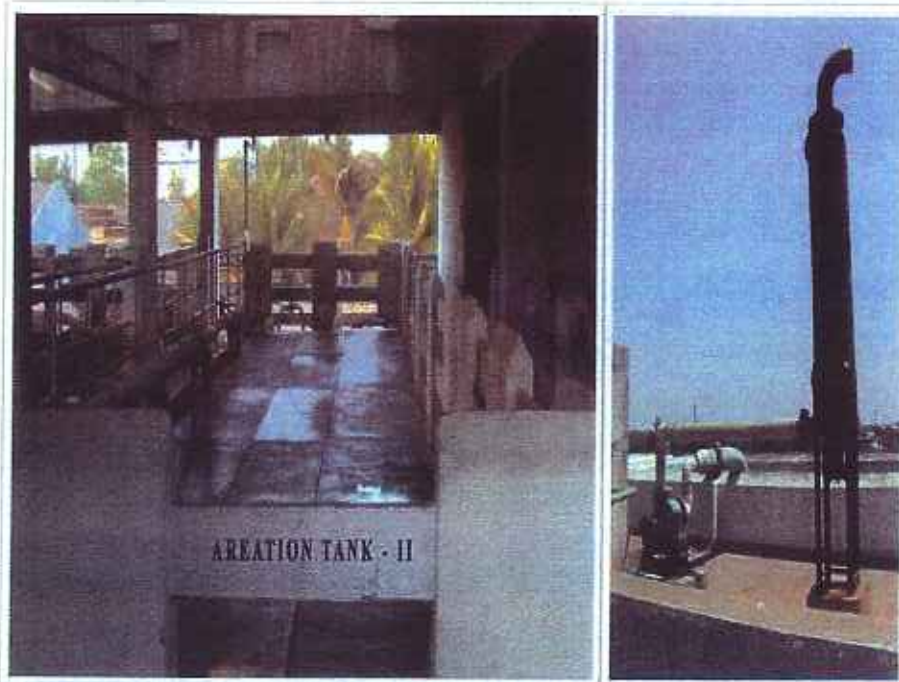
100% Civil work has been completed. Accessories such as Clarifier Mechanism and Walk – Way Bridge have been erected.

SHASUN CHEMICALS & DRUGS

To reduce VOC emissions



Modification of Bio filter with 3 stage Activated Carbon bed to control VOC Emission from Process



FRP SHEET COVERING AT AERATION TANKS WITH PROVISION OF ACFTO CONTROL ODOUR AND VOC EMISSION

Stabilized Solid waste (sludge & Salt) bags for disposal



ETP sludge stabilized with lime and flyash to control odour at site

SPIC (Pharma) Ltd



Mycellia- Odour Control

TAGROS CHEMICALS INDIA LTD



Tagros Chemicals India Limited - Cuddalore
Common Vent Chiller
Common vent chiller with -20C chilled brine circulation for VOC reduction
from plant vents

TANFAC INDUSTRIES LTD , AIF3 SCRUBBER



To reduce HF emission

CEPI SCORE

Hazard = Pollutant source , pathways & receptors

Air

Pollutant

Factor A1- presence of toxins

Group A – SO ₂	-76 µg/m ³	= 1
Group B – PM _{2.5}	-47.7 µg/m ³	= 2
Group B – PM ₁₀	-85 µg/m ³	= 2

Max value for A1 = 2

Penalty value = 1

$$A1 = 2 + 1 = 3$$

Factor A2 = Scale of Industries

R17 = 4 & R54 = 14

Large = 5 (≥ 2 R17 + 10 R54 per 10 sqkm area or fraction)

$$A2 = 5$$

$$\text{Score } A = A1 \times A2 = 3 \times 5 = 15$$

Pathway

Factor B1 – ambient pollutant concentration

Exceedance factor = $\frac{\text{observed mean concn. of criteria pollutant}}{\text{Prescribed standards}}$

$$\text{For PM}_{10} = 85/100 = 0.85$$

$$\text{For SO}_2 = 76/80 = 0.95$$

$$\text{For PM}_{2.5} = 47.7/60 = 0.795$$

E.F is between 0.5 to 1.0

Hence moderate = 2 , penalty = 0

$$B1 = 2 + 0 = 2$$

Factor B2 –Evidence of adverse impact on people

Yes – (when evidence of symptoms of exposure) = 3
NGO /media reports

$$B2 = 3$$

Factor B3– Reliable evidence of adverse impact on ecological features.

$$B3 = 0$$

$$\text{Score B} = (B1+ B2+ B3) = 2 + 3 + 0 = 5$$

Receptor

**Factor C1 = No. of people potentially affected with in 2 km
Radius from pollution source**

10,000 to 1,00,000 = 3

$$C1 = 3$$

Factor C2 - Level of exposure

$$\text{SNLF} = \frac{\text{No.of sample exceeded}}{\text{Total no. of samples}} \times \text{Exceedance factor}$$

Low = 1 (SNLF =0)

Penalty = 0

$$C2 = 1+0 = 1$$

C3 = Additional risk to sensitive receptor

Yes (if > 500 sensitive people/a sensitive historical/archaeological
/Natural park / sanctuary/ ecological habitat within 2 Km
radius) = 5

$$C3 = 5$$

$$C = [C1 \times C2] + C3$$

$$\text{Score C} = [3 \times 1] + 5 = 8$$

Additional High risk element factor D

Score D = 0

SCORE = A + B + C + D

CEPI (Air) = 15 + 5 + 8 + 0 = 28

CEPI SCORE

Hazard = Pollutant source , pathways & receptors

Water (River Uppanar)

Pollutant

Factor A1- presence of toxins

Group A – COD	-101.42 mg/l.	= 1
Group A – Fluorides	-1.2 mg/l.	=1
Group B – Lead	-0.14 mg/l.	=2

Max value for A1 = 2

Penalty value = 0

$$A1 = 2 + 0 = 2$$

Factor A2 = Scale of Industries

R17 = 4 & R54 = 14

Large = 5 (≥ 2 R17 + 10 R54 per 10 sqkm area or fraction)

$$A2 = 5$$

$$\text{Score A} = A1 \times A2 = 2 \times 5 = 10$$

Pathway

Factor B1 – pollutant concentration

Exceedance factor = $\frac{\text{observed mean concn. of criteria pollutant}}{\text{Prescribed standards}}$

For COD = $101.42/250 = 0.406$	E.F is between 1.0 & 1.5
For Fluorides = $1.2/2 = 0.6$	
For Lead = $0.14/0.1 = 1.4$	

Hence High = 3 , penalty = 0

$$B1 = 3 + 0 = 3$$

Factor B2 –Evidence of adverse impact on people

Yes – (when evidence of symptoms of exposure) = 3
NGO /media reports

$$B2 = 3$$

Factor B3– Reliable evidence of adverse impact on ecological features.

$$B3 = 0$$

$$\text{Score B} = (B1+ B2+ B3) = 3 + 3 + 0 = 6$$

Receptor

**Factor C1 = No. of people potentially affected with in 2 km
Radius from pollution source**

$$10,000 \text{ to } 1,00,000 = 3$$

$$C1 = 3$$

Factor C2 - Level of exposure

$$\text{SNLF} = \frac{\text{No.of sample exceeded}}{\text{Total no. of samples}} \times \text{Exceedance factor}$$

$$\text{SNLF (COD)} = 0$$

$$\text{SNLF (Fluoride)} = 0$$

$$\text{SNLF (Lead)} = 3/7 \times 1.4 = 0.6$$

$$\text{Critical} = 3 (\text{SNLF} > 0.5)$$

$$\text{Penalty} = 0$$

$$C2 = 3+0 = 3$$

C3 = Additional risk to sensitive receptor

Yes (if > 500 sensitive people/a sensitive historical/archaeological
/Natural park / sanctuary/ ecological habitat within 2 Km
radius) = 5

$$C3 = 5$$

$$C = [C1 \times C2] + C3$$

$$\text{Score C} = [3 \times 3] + 5 = 14$$

Additional High risk element factor D

Total No of units generating trade effluent = 19

No of units having inadequate facility = 3

% of units deficiency in terms of design/operation & maintenance of
pollution control measures

$$\text{Score D} = 20$$

$$\text{SCORE} = A + B + C + D$$

$$\text{CEPI (Water)} = 10 + 6 + 14 + 20 = 50$$

CEPI SCORE

Hazard = Pollutant source , pathways & receptors

Land (ground water)

Pollutant

Factor A1- presence of toxins

Group A - pH -6.874 mg/L = 1

Group B - Zinc -0.754 mg/L =1

Group B - Lead -0.044 mg/L =2

Max value for A1 = 2

Penalty value = 1

$$A1 = 2+1 = 3$$

Factor A2 = Scale of Industries

R17 = 4 & R54 = 14

Large = 5 (≥ 2 R17 + 10 R54 per 10 sqkm area or fraction)

$$A2 = 5$$

$$\text{Score A} = A1 \times A2 = 3 \times 5 = 15$$

Pathway

Factor B1 - pollutant concentration

Exceedance factor = $\frac{\text{observed mean concn. of criteria pollutant}}{\text{Prescribed standards}}$

For pH = $6.874/8.5 = 0.808$

For Zinc = $0.754/5 = 0.1508$

For Lead = $0.044/0.05 = 0.88$

E.F. is between 0.5 & 1.0

Hence Moderate = 2 , penalty = 0

$$B1 = 2 + 0 = 2$$

Factor B2 –Evidence of adverse impact on people

Yes – (when evidence of symptoms of exposure) = 3
NGO /media reports

$$B2 = 3$$

Factor B3– Reliable evidence of adverse impact on ecological features.

$$B3 = 3$$

$$\text{Score B} = (B1+ B2+ B3) = 2 + 3 + 3 = 8$$

Receptor

**Factor C1 = No. of people potentially affected with in 2 km
Radius from pollution source**

$$10,000 \text{ to } 1,00,000 = 3$$

$$C1 = 3$$

Factor C2 - Level of exposure

$$\text{SNLF} = \frac{\text{No.of sample exceeded}}{\text{Total no. of samples}} \times \text{Exceedance factor}$$

$$\text{SNLF (pH)} = 1/5 \times 0.808 = 0.1616$$

$$\text{SNLF (Zinc)} = 0$$

$$\text{SNLF (Lead)} = 0$$

$$\text{Moderate} = 1.5 (\text{SNLF} < 0.25)$$

$$\text{Penalty} = 0$$

$$C2 = 1.5+0 = 1.5$$

C3 = Additional risk to sensitive receptor

Yes (if > 500 sensitive people/a sensitive historical/archaeological /Natural park / sanctuary/ ecological habitat within 2 Km radius) = 5

C3 = 5

C = [C1 x C2] + C3

Score C = [3 x 1.5] + 5 = 9.5

Additional High risk element factor D

Score D = 0

SCORE = A + B + C + D

CEPI (Land) = 15 + 9 + 9.5 + 0 = 33.5

Calculation of Aggregated CEPI

CEPI (Air) = 28

CEPI (Water) = 50

CEPI (Land) = 33.5

CEPI = $i_m + \{(100 - i_m) \times (i_2/100) \times (i_3/100)\}$

Where i_m = max sub index ,

i_2, i_3 = Sub indices of other media

CEPI = $50 + \{(100 - 50) \times (28/100) \times (33.5/100)\}$

= $50 + (50 \times 0.28 \times 0.335)$

= $53 + 4.4086 = 54.69$