

43. ENVIRONMENT

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43.1 AVERAGE GASEOUS COMPOSITION OF DRY AIR IN THE TROPOSPHERE 2008-09

| <i>Gas</i> | <i>Percent by Volume (%)</i> | <i>By Weight Parts Per Million (ppm)</i> |
|----------------------|----------------------------------|--|
| Nitrogen | 78.084 | 780840 |
| Oxygen | 20.947 | 209470 |
| Argon | 0.934 | 9340 |
| Carbondioxide | 0.036 | 360 |
| Neon | 0.0018 | 18.18 |
| Helium | 0.0005 | 5.24 |
| Methane | 0.00017 | 1.70 |
| Krypton | 0.00011 | 1.14 |
| Hydrogen | 0.000053 | 0.53 |
| Xenon | 0.0000087 | 0.087 |
| Ozone | 0.0008 | 8.0 |

Source: Tamil Nadu Pollution Control Board, Chennai-32

43.2 NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

| Pollutant | Time Weighted Average | CONCENTRATION IN AMBIENT AIR (in $\mu\text{g}/\text{m}^3$) | | | Method of Measurement |
|--|-----------------------|---|---------------------------------|----------------------------|---|
| | | Industrial Area | Residential Rural & Other Areas | Sensitive Area | |
| Sulphur Dioxide (SO_2) | Annual Average * | 80 | 60 | 15 | Improved West & Geake Method –Ultraviolet Fluorescence |
| | 24 Hours ** | 120 | 80 | 30 | |
| Oxides of Nitrogen (as NO_x) | Annual Average * | 80 | 60 | 15 | Jacob + Hochheiser Modified method (Na-Arsenitel) Method |
| | 24 Hours ** | 120 | 80 | 30 | Gas Phase Chemiluminescence |
| Suspended Particulate matter (SPM) | Annual Average * | 360 | 140 | 70 | High Volume sampling (Average flow rate not less than $1.1 \text{ m}^3 / \text{minute}$) |
| | 24 Hours ** | 500 | 200 | 100 | |
| Respirable Particulate matter (size less than 10 μ) | Annual Average * | 120 | 60 | 50 | Respirable particulate matter sampler |
| | 24 Hours ** | 150 | 100 | 75 | |
| Lead (Pb) | Annual Average * | 1.0 | 0.75 | 0.5 | ASS method after sampling using EPM 2000 or equivalent filter paper |
| | 24 Hours ** | 1.5 | 1.0 | 0.75 | |
| Ammonia ¹ | Annual Average * | 0.1 | 0.1 | 0.1 | - |
| | 24 Hours ** | 0.4 | 0.4 | 0.4 | |
| Carbon Monoxide (CO) | 8 Hours * | 5.0 mg/m^3 | 2.0 mg/m^3 | 1.0 mg/m^3 | Non-dispersive infra Red (NDIR) |
| | 1 Hour | 10.0 mg/m^3 | 4.0 mg/m^3 | 2.0 mg/m^3 | Spectroscopy |

Note: * Annual Arithmetic Mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

** 24 hourly / 8 hourly values should be met 98% of the time in a year. However 2% of the time, it may exceed but not on consecutive days.

1. National Ambient Air Quality Standard. The levels of air quality necessary with an adequate margin of safety to protect the public health, Vegetation and property.
2. Whenever and wherever two consecutive values exceeds the limit specified above for the respective category, it would be considered adequate reason to institute regular / continuous monitoring and further investigations.
3. The State Government / State Board shall notify the sensitive and other areas in the respective states within a period of six months from the date of Notification of National Ambient Air Quality Standards.

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43.3 STATE OF AMBIENT AIR QUALITY IN MAJOR CITIES OF TAMIL NADU 2008-09 (ANNUAL AVERAGE)

(Unit 10⁶ grams per cubic metre)

| City | Category | SO ₂ | NO _x | TSPM | RSPM |
|---------------------------------|-------------|-----------------|-----------------|------|------|
| I CHENNAI | | | | | |
| 1. Kathivakkam | Industrial | 14 | 25 | 140 | 61 |
| 2. Manali | Industrial | 14 | 25 | 151 | 81 |
| 3. Thiruvottiyur | Mixed | 14 | 24 | 128 | 66 |
| II MADURAI | | | | | |
| 4. M/s. Sucee Cars & Truks | Industrial | 12 | 26 | 94 | 65 |
| 5. Avvai Girls Hr. Sec. School | Mixed | 10 | 23 | 103 | 34 |
| 6. Highways Buildings | Residential | 9 | 23 | 98 | 37 |
| III COIMBATORE | | | | | |
| 7. District Collector's Office | Mixed | 10 | 32 | 88 | 44 |
| 8. Ponnaiyarajapuram | Residential | 9 | 32 | 87 | 44 |
| 9. SIDCO, Kurichi | Industrial | 11 | 40 | 230 | 102 |
| IV Salem | | | | | |
| 10. Sowdeswari College Building | Mixed | 7 | 33 | 69 | 42 |
| | Industrial | 80 | 80 | 360 | 120 |
| | Residential | 60 | 60 | 140 | 60 |
| V Thoothukudi | | | | | |
| 11. Raja Agencies | Industrial | 18 | 17 | 125 | 90 |
| 12. AVM Buildings | Mixed | 18 | 18 | 116 | 78 |
| 13. Fisheries College | Industrial | 17 | 17 | 90 | 63 |

Source: Tamil Nadu Pollution Control Board, Chennai-32

43.3 (A) STATE OF AMBIENT AIR QUALITY IN CHENNAI CITY 2008-09

| Station | SO ₂ µg/m ³ | NO _x µg/m ³ | RSPM µg/m ³ | SPM µg/m ³ |
|---------------------|-----------------------------------|-----------------------------------|------------------------|-----------------------|
| 1. Anna Nagar | 8 | 18 | 102 | 232 |
| 2. Adyar | 7 | 13 | 40 | 84 |
| 3. Kilpauk * | 8 | 19 | 107 | 242 |
| 4. T. Nagar * | 9 | 21 | 86 | 220 |
| 5. Vallalar Nagar * | 10 | 22 | 100 | 267 |

SO₂ : Sulphurdioxide
 NO_x : Oxides of Nitrogen
 RSPM : Respirable Suspend Particulate Matter (<10 Micron size)
 SPM : Suspended Particulate Matter
 * : Traffic intersection areas

Source: Tamil Nadu Pollution Control Board, Chennai-32
 Dr. Chandra Sekhara
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43.4 AMBIENT NOISE STANDARDS AS PRESCRIBED BY POLLUTION CONTROL BOARD 2008-09

| Area | Log dB (A) | |
|------------------|----------------------|-------------------------|
| | Day Time * dB (A) | Night Time ** dB (A) |
| Industrial Area | 75 | 70 |
| Commercial Area | 65 | 55 |
| Residential Area | 55 | 45 |
| Silence Zone | 50 | 40 |

* Day Time : 06.00 Hours to 22.00 Hours (16 Hours)

** Night Time : 22.00 Hours to 06.00 Hours (08 Hours)

Source: Tamil Nadu Pollution Control Board, Chennai-32

43.5 EMISSION LIMITS FOR DIESEL-DRIVEN VEHICLES 2008-09

| Test | Light Absorption Co-efficient 1/m | Standard Smoke Density | |
|------------------------|--|------------------------|--------------------|
| | | Bosch Units | Hartridge Units |
| Free Acceleration Test | 2.45 | -- | 65.0 |

Source: Tamil Nadu Pollution Control Board, Chennai-32

43.6 NATIONAL AMBIENT AIR QUALITY MONITORING, CHENNAI 2008-09

| Place | Annual Mean Concentrations of Air Pollutants $\mu\text{g}/\text{m}^3$ | | | | | |
|-------------|---|-----------------|-----|--------------------|-----------------|-----|
| | Industrial | | | Residential/ Mixed | | |
| | SO ₂ | NO _x | SPM | SO ₂ | NO _x | SPM |
| Chennai | L | L | L | L | L | H |
| Madurai | L | L | L | L | L | M |
| Coimbatore | L | L | M | L | L | M |
| Salem | - | - | - | L | L | M |
| Thoothukudi | L | L | L | L | L | M |

L: Low

M: Moderate

H: High

C: Critical

Source: Tamil Nadu Pollution Control Board, Chennai-32

43.7 SUMMARY STATUS OF POLLUTION CONTROL IN 17 CATEGORIES OF INDUSTRIES IN TAMILNADU 2008-09

(As on 31-03-2008)

| <i>Category</i> | <i>Total No. of Units</i> | <i>Status (No. of Units)</i> | | |
|------------------------------|---------------------------|------------------------------|------------|---------------------|
| | | <i>Closed</i> | <i>C #</i> | <i>Defaulter ##</i> |
| 1. Aluminium | 1 | -- | -- | -- |
| 2. Caustic Soda | 3 | -- | -- | -- |
| 3. Cement | 20 | -- | -- | -- |
| 4. Copper | 1 | -- | -- | -- |
| 5. Distillery | 13 | -- | -- | -- |
| 6. Dyes and Dying Industries | 1 | -- | -- | -- |
| 7. Fertilizer | 6 | -- | -- | -- |
| 8. Iron and Steel | 1 | -- | -- | -- |
| 9. Tannery | 59 | -- | -- | -- |
| 10. Pesticide | 1 | -- | -- | -- |
| 11. Petrochemicals | 6 | -- | -- | -- |
| 12. Pharmaceuticals | 23 | -- | -- | -- |
| 13. Pulp and paper | 3 | -- | -- | -- |
| 14. Refnery | 2 | -- | -- | -- |
| 15. Sugar | 37 | -- | -- | -- |
| 16. TPP | 10 | -- | -- | -- |
| 17. Zinc | 0 | -- | -- | -- |
| TOTAL | 182 | -- | -- | -- |

Having adequate facilities to comply with the standards

Not having adequate facilities to comply with the standards

Source: Tamil Nadu Pollution Control Board, Chennai-32

43.8 ANALYTICAL OUTPUT (WATER) OF TAMIL NADU POLLUTION CONTROL BOARD LABORATORIES

| <i>Year</i> | <i>Trade Effluents (Received / Analysed)</i> |
|-------------|--|
| 1995-96 | 13483 |
| 1996-97 | 13904 |
| 1997-98 | 17136 |
| 1998-99 | 19212 |
| 1999-00 | 17269 |
| 2000-01 | 17646 |
| 2001-02 | 15489 |
| 2002-03 | 17385 |
| 2003-04 | 15490 |
| 2004-05 | 15499 |
| 2005-06 | 15563 |
| 2006-07 | 15109 |
| 2008-09 | 14821 |

Source: Tamil Nadu Pollution Control Board, Chennai-32

43.9 NUMBER OF INDUSTRIES VISITED FOR AIR SURVEY AND NUMBER OF AAQS/SM SAMPLES COLLECTED

| <i>Period of Monitoring</i> | <i>No. of Industries</i> | <i>Number of Samples Collected</i> | |
|-----------------------------|--------------------------|------------------------------------|-----------|
| | | <i>AAQS</i> | <i>SM</i> |
| 1995-96 | 284 | 1521 | 448 |
| 1996-97 | 376 | 2027 | 572 |
| 1997-98 | 427 | 2213 | 590 |
| 1998-99 | 412 | 2290 | 584 |
| 1999-00 | 466 | 2594 | 631 |
| 2000-01 | 466 | 2459 | 671 |
| 2001-02 | 574 | 3113 | 1098 |
| 2002-03 | 606 | 3375 | 1305 |
| 2003-04 | 687 | 3785 | 1447 |
| 2004-05 | 659 | 3727 | 1507 |
| 2005-06 | 823 | 4320 | 1879 |
| 2006-07 | 783 | 4224 | 1938 |
| 2008-09 | 862 | 4166 | 1860 |

Source: Tamil Nadu Pollution Control Board, Chennai-32
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43.10 NUMBER OF GOODS AND TRANSPORT VEHICLES TESTED AND EMISSION LEVEL RECORDED DURING 2008-09

| <i>Station</i> | <i>Diesel</i> | | |
|----------------|------------------------|-------------------------|----------------------------|
| | <i>Total Vehicles</i> | <i>Within the limit</i> | <i>Exceeding the limit</i> |
| <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| Chennai | 38118 | 37225 | 893 |
| Chengalpattu | } ←----- CLOSED -----> | | |
| Kancheepuram | | | |
| Udhagamandalam | | | |
| Kattery | | | |
| Dindigul | | | |
| Palani | | | |
| TOTAL | 38118 | 37225 | 893 |

| <i>Station</i> | <i>Petrol</i> | | |
|----------------|------------------------|-------------------------|----------------------------|
| | <i>Total Vehicles</i> | <i>Within the limit</i> | <i>Exceeding the limit</i> |
| <i>1</i> | <i>5</i> | <i>6</i> | <i>7</i> |
| Chennai | 773 | 762 | 11 |
| Chengalpattu | } ←----- CLOSED -----> | | |
| Kancheepuram | | | |
| Udhagamandalam | | | |
| Kattery | | | |
| Dindigul | | | |
| Palani | | | |
| TOTAL | 773 | 762 | 11 |

| <i>Station</i> | <i>Total (Diesel + Petrol)</i> | | |
|----------------|--------------------------------|-------------------------|----------------------------|
| | <i>Total Vehicles</i> | <i>Within the limit</i> | <i>Exceeding the limit</i> |
| <i>1</i> | <i>8</i> | <i>9</i> | <i>10</i> |
| Chennai | 38891 | 37987 | 904 |
| Chengalpattu | } ←----- CLOSED -----> | | |
| Kancheepuram | | | |
| Udhagamandalam | | | |
| Kattery | | | |
| Dindigul | | | |
| Palani | | | |
| TOTAL | 38891 | 37987 | 904 |