Chapter II

Performance Audit

This chapter includes the performance audit on Role of Rajasthan State Pollution Control Board in controlling air pollution in the State.

Environment Department

2.1 Role of Rajasthan State Pollution Control Board in controlling air pollution in the State

Executive Summary

The responsibility of prevention, control and abatement of air pollution under the provisions of Air (Prevention and Control of Pollution) Act, 1981 is entrusted to the Rajasthan State Pollution Control Board (RSPCB).

The five cities of Rajasthan i.e. Alwar, Jaipur, Jodhpur, Kota and Udaipur are in the list of top 100 polluted cities in the world and are considered as 'non-attainment' cities by Central Pollution Control Board (CPCB). These cities have not met the National Ambient Air Quality Standards consecutively over three years' period. The source apportionment studies were not carried out in these cities to identify and quantify the sources of pollution. In absence of which RSPCB could not prepare comprehensive programmes for prevention, control or abatement of air pollution.

(Paragraph 2.1.6.1 and 2.1.6.2)

In case of National Capital Region (NCR) area or non-attainment cities of the State, no action plans were submitted by the concerned department/ authority. Resultantly directions issued by CPCB could not be monitored by RSPCB, hence, most of the actions given in the direction could not be initiated.

(Paragraph 2.1.6.3)

As of March 2017, only 32 Ambient Air Quality Monitoring Stations and two Continuous Ambient Air Quality Monitoring Stations were operating in six districts while 27 districts having 47.03 million population and 74.50 lakh vehicles were still out of the purview of air quality monitoring. It was also seen that RSPCB and Environment Department did not have meaningful data of the sources of pollution in rural areas in absence of which planning to mitigate pollution could not be undertaken.

(Paragraph 2.1.7.1)

The annual mean value of Respirable Suspended Particulate Matter (RSPM) (PM_{10}) ranged between 87µg/m^3 and 295µg/m^3 which exceeds the prescribed limit (60.00µg/m^3) in all 21 Ambient Air Quality Monitoring Stations. Periodic survey to identify the sources of air pollution and the adverse impact on eco-system as well as human health was neither done by RSPCB nor were any action plan prepared with clear timelines to reduce the air pollution.

In Jodhpur, the first measurement of $PM_{2.5}$ was taken after 42 months of installation of sampler and only 19 measurements were taken up to June 2015 against 120 measurements required to be taken. In absence of proper monitoring of $PM_{2.5}$, the purpose of procuring the costly equipment was defeated.

(Paragraph 2.1.7.2)

The samplers were installed at unapproved locations. The instruments for measuring air quality at monitoring stations were installed in violation of the guidelines. This has the risk of generating inaccurate and non-representative result.

Information on type and number of vehicles and meteorological data with respect to temperature, relative humidity, wind speed and its direction was neither collected by the RSPCB nor maintained at the 27 Ambient Air Quality Monitoring Stations test checked as required under National Air Quality Monitoring Programme guidelines.

(Paragraph 2.1.7.3)

RSPCB does not have consolidated data of category wise number of industrial units covered under consent mechanism in the State. It had neither conducted any survey nor coordinated with other departments to effectively discharge its regulatory functions to cover all industrial units under its consent mechanism.

In joint inspections of 148 industrial units by audit team along with representatives of Regional Offices (ROs), RSPCB, it was found that 15 industrial units were operating without even consent to establish.

(Paragraph 2.1.8.1)

The RSPCB did not evolve any mechanism to watch the renewal of consent to operate after expiry of the validity period of consent issued earlier. There was inordinate delay in issuing consents and consents were issued with retrospective effect in some cases. Test check of 573 cases of the selected ROs revealed that 74 industries had run without consent to operate for periods ranging from 14 to 3038 days. During joint inspection, 12 units were found operating though their CTOs had expired.

(Paragraph 2.1.8.2)

Number of detection and death cases of silicosis were continuously increasing. Detection and death cases were 304 and one respectively in 2012-13, which increased to 4931 and 449 respectively in 2016-17.

(Paragraph 2.1.8.3)

In compliance with recommendation of Rajasthan Human Rights commission, RSPCB had committed to carry out Ambient Air Quality Monitoring periodically near clusters of mines/quarries. However, the details of clusters of mines were not provided by the Director, Mines and Geology to the RSPCB. In absence of this, the RSPCB had neither prepared any plan for frequency of inspection nor had started ambient air monitoring near mining clusters.

(Paragraph 2.1.8.4)

All units of Kota Super Thermal Power station (KSTPS) and Chhabra Thermal Power Plant (CTPP) were operating without obtaining consent to operate/renewal of consent to operate which was the violation of provision of the Air Act.

(Paragraph 2.1.8.5)

In KSTPS, prescribed standards of Particulate Matter (150 mg/Nm^3) and RSPM (100µg/m^3) could not be achieved as Particulate Matter remained between 174 and 952mg/Nm^3 and RSPM remained between 110 and 202µg/m^3 for the period 2012-13 to 2016-17.

(Paragraph 2.1.8.6)

In Jaipur, 33 brick kilns had not even applied for Consent To Establish/Consent To Operate (CTE/CTO). No concrete steps were taken by RSPCB against these units. Further, three brick kilns were found operating without consent to operate regularly during inspections carried out by the respective ROs despite the fact that closure notices were issued to them about six years ago.

(Paragraph 2.1.8.9)

In seven stone crusher units in Udaipur, Suspended Particulate Matter (SPM) level had exceeded the prescribed limits (600 µg/m^3) and ranged between 2286 and 4685µg/m^3. However, the Regional Officer renewed CTO without ensuring adherence to the norms as no further sample analysis report was found on record.

(Paragraph 2.1.8.10)

The Transport Department also failed to prepare an action plan to phase out the 15-year-old vehicles. No action was taken to ensure that the Pollution Under Control Certificate centres were functioning as per prescribed norms.

(Paragraph 2.1.10.1)

The Transport Department neither conducted any survey to identify the places with heavy traffic nor was pollution load assessed in major cities of the State.

(Paragraph 2.1.10.2)

Only 22 Pollution Flying Squads (PFS) were covering 10 out of 12 regions for monitoring of polluting vehicles. Two regions comprising six districts had no PFS. Further, Transport Department did not have data of number of vehicles which were found emitting excess pollutants during inspections by the flying squads.

(Paragraph 2.1.10.4)

During joint inspection of Pollution Under Control (PUC) centres, it was observed that Transport Department had issued licences without verifying the site and equipment of PUC centres as 20 licensees had not installed equipment but they had the requisite licenses from the Transport Department. In 10 instances, PUC certificates were issued by the operator of PUC centres without testing of vehicles. In Udaipur, one centre was generating computerised certificates on plain paper from computer while these should have been issued on stationery allotted from Rajasthan Petroleum Dealers Association.

(Paragraph 2.1.10.6)

Manpower management in RSPCB was poor. The vacancies were steadily increasing thus impacting the effective functioning of the Board.

(Paragraph 2.1.11.3)

There was shortfall in conducting inspection of highly polluting industrial units during 2012-17 which ranged between 48 and 60 per cent.

(Paragraph 2.1.12.1)

Number of stack samples analysed by Central Laboratory reduced by 50 per cent in 2016-17 when compared to the year 2012-13 indicating decreased testing.

(Paragraph 2.1.12.2)

2.1.1 Introduction

Air pollution has become a growing concern in the past few years, with an increasing number of acute air pollution episodes in many cities worldwide. Ambient (outdoor) air pollution alone kills around three million people each year, mainly from non-communicable diseases. Air pollution continues to rise at an alarming rate, and affects economies and quality of life in all regions. Air pollution has also been identified as a global health priority in the sustainable development agenda.

Sources of Air Pollution

The commonly identified sources of air pollution are:

Natural: Forest Fire, Windblown dust such as road dust, soot, physical processes of crushing, grinding and abrasion of surface, Volcanoes, Lightning, *etc*.

Manmade - Burning of fossil fuels, smelting of metals, Road traffic emissions from vehicles, Non-combustion processes (e.g. quarrying), Agricultural

activities, Burning of crop residues, Tobacco smoke, Wood smoke, Industrial emissions, fly ash, *etc*.

Substances that are generally recognized as air pollutants include SPM[1], RSPM[2], Sulphur Dioxide (SO_2), Nitrogen Oxide (NO_2), Carbon Monoxide (CO), Carbon Dioxide (CO_2), Methane and Ozone depleting substances such as Chlorofluorocarbon (CFC). These pollutants adversely affect man and material, flora and fauna equally.

As per the World Health Organisation's (WHO) report on 'Ambient Air Pollution 2016, India has the highest number of polluted cities in the world. Out of the 100 most polluted cities in the world, India has 33, while 22 cities among the top 50 most polluted cities are in India.

There are five cities of Rajasthan in this list of top 100 polluted cities in the world: Jodhpur, Jaipur, Kota, Udaipur and Alwar.

According to the Indian Council of Medical Research's (ICMR's) Health of the Nation's States Report 2017, the contribution of air pollution to disease burden remains high in India, with levels of exposure among the highest in the world. It causes burden through a mix of non-communicable and infectious diseases, mainly cardiovascular diseases, chronic respiratory diseases and respiratory tract infections. The burden of outdoor air pollution has increased due to a variety of pollutants from power production, industry, vehicles, construction and waste burning. The burden due to outdoor air pollution is highest in a mix of northern states, including Rajasthan, Haryana, Uttar Pradesh and Punjab.

The Report also highlights that Rajasthan has the dubious distinction of faring significantly higher than the national mean in terms of death rates caused due to pulmonary diseases, lower respiratory tract infections and Asthma. Similarly, Rajasthan has the highest ratio of the Disability Adjusted Life Years (DALY) rate attributable to air pollution in the country and it is the second biggest reason for loss of life in the State, after malnutrition.

Air Quality Index (AQI) is a tool for effective communication of air quality status to people in terms which are easy to understand. It transforms complex air quality data of various pollutants into a single number (index value), nomenclature and colour. There are six AQI categories, namely Good, Satisfactory, Moderately polluted, Poor, Very Poor, and Severe. Each of these categories is decided based on ambient concentration values of air pollutants and their likely health impacts (known as health breakpoints). As per Central Pollution Control Board's (CPCB) bulletin of Ambient Air Quality (January 2016), the analysis of AQI values in Rajasthan during September 2015 indicates that only six *per cent* AQI values are in good category, 49 *per cent* in satisfactory, 41 *per cent* in moderate category, two *per cent* are poor and two *per cent* are in severe category. This indicates the adverse impact of pollution on the health of the people of the state.

[1] Suspended Particulate Matter are microscopic solid or liquid matter suspended in earth's atmosphere.

[2] Particulate matters with aerodynamic diameter less than or equal to 10 micrometers thus also name as PM_{10}.

Organizational Structure

Environment Department

The Department of Environment in Rajasthan was established in September 1983. The Department is headed by Additional Chief Secretary (ACS) assisted by Secretary, Director and Joint Secretary. The Department has been entrusted with the responsibility of prevention and control of atmospheric pollution including all matters connected with the RSPCB. The ACS is responsible for formulation of policy regarding environment protection and overall monitoring of authorities like RSPCB.

Rajasthan State Pollution Control Board

The RSPCB was constituted under Section 4 of the Water (Prevention and Control of Pollution) Act, 1974 (February 1975) with the objective of prevention and control of water pollution. Later, it was entrusted with the responsibility of prevention, control and abatement of air pollution under the provisions of Air (Prevention and Control of Pollution) Act, 1981 (The Act). The RSPCB has a two-tier structure with headquarters at Jaipur and Regional Offices at 15 locations[3]. The RSPCB has established one Central Laboratory at Jaipur and four regional laboratories at Alwar, Jodhpur, Kota and Udaipur. In addition to this, eight regional laboratories are partially operative. The RSPCB is headed by the Chairperson.

Monitoring of air pollution is the responsibility of the Board under the Air Act while the control of vehicular pollution is the responsibility of the Transport Department under Central Motor Vehicles Act, 1988 and Rules, 1989. The Board was to lay down the standards for automobile emission under Section 17(1) (g) of the Air Act and the State Government in consultation with the Board was to instruct the Transport Department under Section 20 of the Air Act to ensure the compliance with the standards laid down.

2.1.2 Audit Objective

A Performance Audit of 'Role of Rajasthan State Pollution Control Board in controlling air pollution in the State' was conducted with the objective to assess whether the planning, implementation and monitoring for prevention, control and abatement of air pollution were proper, adequate and effective.

2.1.3 Audit Criteria

The Audit criteria were derived from:

- Air (Prevention and Control of Pollution) Act, 1981 and rules framed there under;
- The Central Motor Vehicles Rules, 1989 notified under the Motor Vehicle Act, 1988 and Rajasthan Motor Vehicle Rules, 1990;
- Rajasthan State Environment Policy, 2010; and

[3] Alwar, Balotra, Bharatpur, Bhilwara, Bhiwadi, Bikaner, Chittorgarh, Jaipur (North), Jaipur (South), Jodhpur, Kishangarh, Kota, Pali, Sikar and Udaipur.

- Notifications, circulars and orders issued by Government of India, State Government, Central Pollution Control Board and RSPCB.

2.1.4 Audit Coverage and Methodology

A Performance Audit of Role of Rajasthan State Pollution Control Board in controlling air pollution in the State was conducted covering the period from 2012-13 to 2016-17 in the office of the RSPCB at Jaipur along with Central Laboratory, six Regional Offices[4] (ROs) out of 15 and four Regional Laboratories[5]. Relevant records in the Departments of Environment and Forest, Transport and respective Implementing Agencies[6] were also scrutinized. Five ROs were selected on the basis of the World Health Organisation's Report (2016) on hundred most polluted cities of the world. These were the only ROs where ambient air quality monitoring was done by RSPCB (during the period of audit). Further one Regional office, Bhiwadi was selected as it has critically polluted industrial cluster and is ranked sixth among 88 clusters in the Comprehensive Environmental Pollution Index prepared by CPCB (2009). Besides it is part of the NCR.

The audit team with the representatives of concerned Regional Offices, RSPCB jointly visited 148 industrial units[7] and 33 air monitoring stations[8] under the jurisdiction of six selected ROs. Besides, 120 PUC centres were also jointly visited along with the flying squad of concerned five Regional Transport Offices.

The reply of the State Government has not been received. However, audit findings were discussed in the exit conference (11 October 2017) and on the basis of discussion, the State Government response has suitably been incorporated in the paragraph.

Audit Findings

The audit findings are discussed in succeeding paragraphs.

2.1.5 Financial Arrangement

Financial resources of RSPCB comprised water cess, consent fees and other receipts. Position of income and expenditure of the RSPCB for the period from 2012-13 to 2016-17 is given in ***Appendix-2.1.***

The CPCB co-ordinates with the RSPCB to ensure uniformity and consistency of air quality data and it provides technical and financial support to RSPCB for operating the Monitoring Stations in the State. The total receipts and

[4] Alwar, Bhiwadi, Jaipur (North), Jodhpur, Kota and Udaipur.
[5] Alwar, Jodhpur, Kota and Udaipur.
[6] Pollution Under Control centres (PUC centres)
[7] Thermal power plants, cements, stone crusher, brick kiln *etc*.
[8] 27 Ambient Air Quality Monitoring Stations and six Continuous Ambient Air Quality Monitoring Stations

expenditure under National Air Quality Monitoring Programme[9] (NAMP) during 2012-13 to 2016-17 were ₹ 0.90 crore and ₹ 0.85 crore respectively.

It was noticed that:

- the percentage of surplus funds ranged between 62 and 74 *per cent* of total funds available during the respective years.
- out of the total expenditure of ₹ 108.41 crore (2012-16), only 12 *per cent* (₹ 13.52 crore) was spent on project activities under various Acts[10] and the rest on establishment and other expenses.
- huge surplus funds[11] were parked in the fixed deposits and PD accounts. As a result, ₹ 12.46 crore was paid as income tax during the last four years.

It is clear from above that there was a meagre expenditure on projects to control pollution in the State.

Audit also observed that activities and programmes were affected due to laxity in planning, implementation, lack of enforcement of rules and poor management information system as discussed in succeeding paragraphs.

2.1.6 Planning

Planning forms one of the most important aspect of project implementation. It includes sequence of activities, programmes, action plans, *etc.* to achieve specific goals. The planning for implementation of project activities were marred by lack of comprehensive programme to prevent pollution, not taking up of apportionment studies and non-preparation of action plans besides other activities as discussed below:

2.1.6.1 Lack of comprehensive programmes to prevent and control air pollution

According to Section 17 of the Act, RSPCB was required to prepare comprehensive programmes for prevention, control or abatement of air pollution. The programmes should have included steps for Control of Vehicular Emissions such as action against visibly polluting vehicles, action plan to check fuel adulteration and random monitoring of fuel quality data, Control of Road Dust/Re-suspension of dust and other fugitive[12] emission. This was to be done through formulation of action plans for creation of green buffers along the traffic corridors, Control of Industrial Air Pollution such as action against unauthorized brick kilns and industrial units not complying with standards, *etc.*

It was seen that RSPCB had not initiated effective programmes for prevention and control of air pollution in the State. Audit observed that the RSPCB

[9] The CPCB had started National Ambient Air Quality network during 1984-85 which was later renamed as National Air Quality Monitoring Programme (NAMP)

[10] The Water (Prevention and Control of Pollution) Act, 1974, The Environment Protection Act, 1986, The Public Liability Insurance Act, 1991 *etc.*

[11] As on 31.03.2012 FDR was ₹ 189.57 crore, as on 31.03.2013 ₹ 244.77 crore, as on 31.03.2014 ₹ 293.44 crore, as on 31.03.2015 ₹ 332.41 crore and as on 31.03.2016 total FDR was ₹ 386.24 crore. Balance in PD A/c was ₹ 12.73 crore as of 31 March 2016.

[12] Fugitive emissions are emission of gases or vapours from pressurised equipment due to leaks and other unintended or irregular release of gases, mostly from industrial activities.

merely forwarded the instructions issued by the CPCB to the executive departments but did not follow up on them. There was lack of coordination between the RSPCB and other relevant departments which led to non-identification of sources of air pollution along with their quantification through source apportionment studies as discussed in succeeding paragraphs.

2.1.6.2 Source Apportionment studies not undertaken

Apportionment studies include preparation of emission inventories, monitoring of ambient air quality for various pollutants, chemical speciation[13] of ambient PM_{10}[14] and $PM_{2.5}$[15] of source emission to assess the contribution from various sources, future projections and evaluation of various control options to develop cost-effective action plans or intervention for mitigating air pollution.

The constituent of Sulphur Dioxide, Nitrogen Oxide and particulate matter in the environment should be within standards fixed by CPCB. The cities which do not fulfill the standards were considered as non-attainment cities. It was seen that in Rajasthan, five cities[16] are considered as 'non-attainment' consecutively over three years' period[17]. Consequently, Central Pollution Control Board suggested (August 2014) to the RSPCB to evolve effective action plans and undertake source apportionment studies. CPCB also urged (January 2015) RSPCB to submit action plans and carry out source apportionment studies in the 'non-attainment cities' with population of more than a million.

Audit scrutiny revealed that no action for source apportionment studies was undertaken by RSPCB. However, the RSPCB in its meeting (July 2016) approved a proposal of ₹ 1.12 crore for conducting air quality assessment, and source apportionment study only in Jaipur city. As per the Memorandum of Understanding (MoU) with Indian Institute of Technology (IIT), Kanpur (January 2017), the study would be completed by July 2018. The RSPCB, therefore, took 23 months to initiate the source apportionment study for one out of three cities having a population of more than one million.

In absence of source apportionment studies in 'non-attainment' cities, the RSPCB failed to get fundamental inputs for policy making and could not formulate an effective strategy and action plan to combat air pollution in these cities.

Secretary, Environment Department stated in the exit conference that source apportionment studies must be carried out as per directions of the CPCB and expertise from IITs must be sought by RSPCB. Chief Environment Engineer stated that the study involves large data analysis. It was also stated that trained technical staff are required to accomplish the task but resources are limited.

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[13] Quantity mass concentration and significant PM_{10} or $PM_{2.5}$ constitutes which include trace elements sulfate, nitrate, sodium, potassium, ammonium and carbon.

[14] Particles with a diameter between 2.5 and 10 micrometers, a health hazard.

[15] Fine particles with a diameter of 2.5 micrometers or less, a health hazard.

[16] Alwar, Jaipur, Jodhpur, Kota and Udaipur (three of these *i.e.* Jaipur, Jodhpur and Kota having population of more than one million)

[17] During 2011 to 2013.

However, RSPCB would make concerted efforts to take up such studies on priority once the first study was completed.

2.1.6.3 Non-preparation of action plans

Under Section 18 (1) (b) of the Act, the CPCB issued (December 2015) directions to the RSPCB for prevention, control or abatement of air pollution and improvement of National Ambient Air Quality in Delhi and NCR which included 42 action points ***(Appendix-2.2)*** within specified[18] timelines.

CPCB further issued (July 2016) directions to the RSPCB to improve the air quality, particularly in the areas of non-attainment cities. These steps required a multipronged, sustained and integrated approach including close monitoring of implementation. The direction included 31 actions points[19] to be undertaken within a clear specified timeframe. Most of the activity was to be completed within 180 days. Action plan on these points was to be submitted to the CPCB within 45 days. Accordingly, RSPCB issued (January and July 2016) directions under Section 31-A of the Act to the various authorities/departments[20] for implementing the directions of CPCB.

Audit scrutiny revealed that in case of non-attainment cities, no action plans were submitted by any department/authority (April 2017). Thus directions issues by CPCB could not be monitored by RSPCB. Further in case of NCR, action plans were not submitted by five departments[21] to the RSPCB even after lapse of more than one year. As a result, planning for implementation of measures as prescribed could not be made.

This was indicative of the fact that RSPCB failed to take concrete steps for expediting preparation of action plans in absence of which most of the actions to be undertaken for improving the air quality had not been initiated in both NCR and non-attainment cities. (April 2017).

The Secretary, Environment Department informed during exit conference that Central Government had issued (January 2017) the notification of Graded Action Plan at the direction of Supreme Court but its execution was quite difficult because of resource constraints. The Chief Environment Engineer, RSPCB stated that response to the directions issued by RSPCB about the action plans was being received from concerned departments and latest progress in this regard would be made available to audit.

2.1.7 Implementation

The Rajasthan State Environment Policy 2010 considered the air quality monitoring network of the State to be inadequate and envisaged its enhancement. Possibilities of implementing PPP models for effective air quality monitoring across the State by involving the private sector as well as

[18] Actions on 39 points were to be completed within 90 days and remaining actions within a year.

[19] Among these, 25 points were also covered in 42 points related to NCR.

[20] Department of Transport, Mines and Petroleum, Local Self Government, Food and Supply, Urban Development and Housing, Agriculture *etc.*

[21] Food and Supply, Mines and Petroleum, Transport, Local Self Government, Urban Development and Housing.

research and academic institutes were also to be explored. The implementation included installation of Ambient Air Quality Monitoring Station (AAQMS) and Continuous Ambient Air Quality Monitoring Station (CAAQMS)[22] and monitoring the sources of pollution.

2.1.7.1 Functioning of AAQMS

Environment Department, Government of Rajasthan after consultation with the RSPCB had declared[23] the whole of the State of Rajasthan as air pollution control area for the purpose of the Act. Thus, the RSPCB was required to operate air quality monitoring stations covering all the cities of the State.

- There were only 21 AAQMS in five cities[24] till the year 2010. It was seen that no AAQMS was established in the State during 2010-15. Audit scrutiny revealed that 11 AAQMS were established in four cities[25] during 2015-17 (out of 15 AAQMS sanctioned between March 2006 and December 2015) with delays ranging from two to nine years. The reasons for delays in establishment of AAQMS were not intimated to audit. Besides, two CAAQMS[26] were also in operation since July 2012. It was also seen that the RSPCB confined the air quality monitoring network to only six districts[27] out of total 33 districts in the State.

This is indicative of the fact that RSPCB failed to enhance adequately the air quality monitoring network in the State. It is to be noted that there are other 27 districts having 47.03 million population with 74.50 lakh vehicles which were still out of the purview of air quality monitoring.

- During test check of records of Regional Office Jodhpur it was also seen that no air quality monitoring was done at any of the six stations in Jodhpur during March to October 2014 due to stoppage of work by its Field Assistant. No alternative arrangements were made by the RSPCB for regular monitoring. In absence of regular monitoring, the purpose of setting up of AAQMS was defeated.

- For the Rural areas, the CPCB had sought (June 2015) a detailed proposal for establishment of 10 manual ambient air quality stations for the State to capture the air quality data and build database on crop residue burning. However, no proposal was submitted by the RSPCB (September 2017). As a result, the RSPCB and Environment department did not have meaningful data of the sources of pollution in rural areas.

Thus in the absence of data relating to air pollution in rural areas and lack of air quality stations in urban areas to capture the air quality data, the planning to mitigate pollution could not be undertaken.

The RSPCB replied (June 2017) that due to lack of infrastructural facilities and human resources it was not possible to monitor ambient air quality in

[22] CAAQMS is an automatic real time monitoring station.
[23] Notification issued (February 1988) by the Secretary, Department of Environment, GoR.
[24] Alwar, Jaipur, Jodhpur, Kota and Udaipur.
[25] three in Bhiwadi (two in 2015 and one in 2016), three in Bharatpur (one in 2015 and two in 2016), three in Kota (in 2016) and two in Jaipur (in 2017).
[26] One each in Jaipur and Jodhpur.
[27] Alwar, Bharatpur, Jaipur, Jodhpur, Kota and Udaipur

other areas. The Chief Environment Engineer, RSPCB stated during exit conference that at present 10 Real Time/Continuous Ambient Air Quality Monitoring Stations and 36 manual air quality monitoring systems were in operation. It was also stated that RSPCB was planning to establish five more Real Time/Continuous Ambient Air Quality Monitoring Stations in the State. However, the fact remains that only 32 AAQMS and two CAAQMS were in operation during the review period and that too in only six districts of the State. Further, as brought out earlier there was no constraint of funds.

2.1.7.2 Monitoring of air pollutants

The CPCB had notified National Ambient Air Quality Standards (NAAQS) in November 2009 with 12 identified pollutants. It included five gaseous pollutants such as Sulphur Dioxide (SO_2), Nitrogen Oxide (NO_2), Ozone (O_3), Carbon Monoxide (CO) and Ammonia (NH_3), two dust related parameters (PM_{10} and $PM_{2.5}$), three metals (Lead, Nickel and Arsenic) and two organic pollutants (Benzene and BaP-particulate).

Audit scrutiny revealed that the RSPCB was monitoring only three air pollutants *i.e.* SO_2, NO_2 and RSPM/PM_{10} regularly at all the 32 AAQMS. $PM_{2.5}$ was being monitored only at two AAQMS[28]. The reasons for not analyzing all 12 pollutants in all AAQMS were called for. The RSPCB stated that (June 2017) lack of infrastructural facilities was the main reason for not analyzing all the pollutants. Secretary, Environment Department stated in exit conference that all over India only three major pollutants were being monitored at all air monitoring stations and the remaining were studied only in specific situations. The reply should be seen in the light of the fact that in a review meeting held (July 2014) on NAMP, it was suggested by Chairperson, CPCB that the other notified parameters should also be included in the monitoring mechanism. CPCB had communicated (December 2014) to the RSPCB the need to upgrade the AAQMS to measure five more parameters. This was indicative of the fact that despite availability of funds RSPCB failed to strengthen the infrastructure facilities in monitoring of air pollution.

Measurement of SO_2, NO_2 and PM_{10}

Scrutiny of the results of analysis reports in respect of the 21 stations[29] located in the five cities for the years 2012 to 2016 revealed that:

- The annual mean value of SO_2 ranged between 5.10 µg/m^3 and 13.50 µg/m^3 which was within the prescribed limit (50.00 µg/m^3).
- The annual mean value of NO_2 ranged between 19.40µg/m^3 and 54.32µg/m^3 which slightly exceeded the prescribed limit (40.00µg/m^3).
- The annual mean value of RSPM (PM_{10}) ranged between 87µg/m^3 and 295µg/m^3. This pollutant always exceeded the prescribed limit (60.00µg/m^3) in all 21 AAQMS for the five-year period from 2012 to 2016. Audit analysis revealed that annual mean value was ranging in two cases between 60µg/m^3 and 100µg/m^3; in 48 cases between 101µg/m^3 and 150µg/m^3; in 27 cases

[28] Jaipur and Jodhpur.

[29] Scrutiny of monitoring data of 21 AAQMS which were established prior to 2012 was undertaken.

between 151µg/m^3 and 200µg/m^3; and in 28 cases, it was more than 200µg/m^3. It is evident from analysis that PM_{10} always exceeded the prescribed limit but periodic survey to identify the sources of air pollution and the adverse impact on eco-system as well as human health was neither done by RSPCB nor were any action plans prepared with clear timelines and commitment to reduce the air pollution.

Measurement of $PM_{2.5}$

Measurement of $PM_{2.5}$ was not monitored adequately in the State.

➢ As per National Ambient Air Quality Standards, the annual arithmetic mean of 104 measurements of $PM_{2.5}$ in a year at a particular site should be taken by measuring the level twice a week 24 hourly at uniform intervals.
It was observed that during May to December 2012 (except July 2012) no measurement of $PM_{2.5}$ was made in Jaipur while only one sample was analysed in the month of April 2012. Samples were not analysed twice a week as required during August to December 2011 and only 20 samples were analysed against the required 40 during the period. Scrutiny of analysis reports for the station for the period from July 2011 to March 2017 revealed that the test results were almost within the permissible limits except on 29 occasions wherein the concentration values exceeded slightly and ranged between 60.57 µg/m^3 and 104.76µg/m^3 against National Ambient Air Quality Standards of 60 µg/m^3.

Audit scrutiny also revealed that two out of three $PM_{2.5}$ samplers purchased for Jaipur and Jodhpur were not working adequately as discussed below:

➢ The RSPCB placed supply order (February 2010) for three[30] $PM_{2.5}$ sampler[31] at a cost of ₹ 15.92 lakh for monitoring $PM_{2.5}$ in Jaipur and Jodhpur. Out of these three samplers, (November-December 2010) one each was installed in Jaipur and Jodhpur and one was kept on standby at Jaipur. Monitoring of $PM_{2.5}$ commenced from July 2011 and May 2014 in Jaipur and Jodhpur respectively. As the sampler at Jaipur was not working properly it was replaced by another one. During scrutiny of records of RO, Jodhpur it has been observed that $PM_{2.5}$ sampler was out of order since June 2015. As of May 2017 only one sampler in Jaipur was in working condition and two samplers[32] were out of order. However, the RSPCB could not resolve this problem within the warranty period[33].

➢ In Jodhpur, the first measurement of $PM_{2.5}$ was taken after 42 months of installation of sampler and only 19 measurements were taken up to June 2015 against 120 measurements required to be taken. Thereafter, it was mentioned on record that the instrument was not working. In absence of monitoring of $PM_{2.5}$, the purpose of procuring the costly equipment was defeated.

Monitoring of Benzene level not initiated

Benzene is one of the hydrocarbons present in the atmosphere at trace level. It is an atmospheric pollutant that may have effect on human health. Escape of

[30] two for Jaipur and one for Jodhpur
[31] Thermo Fisher Make Model Partisol 2000 FRM
[32] One each in Jaipur (March 2015) and Jodhpur (June 2015)
[33] Effective from the date of satisfactory installation.

Benzene is controlled at petrol pumps by a device called a Vapour Recovery System. Further as per the NAAQS set by the CPCB, the permissible level of Benzene is 5μg/m^3.

During review of records of RSPCB, it was noticed that:

- No plan to monitor and control the benzene level was made;
- The RSPCB did not carry out any testing of benzene level near the retail petrol/diesel stations in any city of the State.
- The RSPCB did not ensure installation of Vapour Recovery System at the retail petrol/diesel stations.
- Out of 3592 Automobile Fuel Outlet[34] (Dispensing) in the State, the RSPCB issued only 26 Consent to Establish (CTEs) and Consent to Operate (CTOs) to Automobile Fuel Outlet (Dispensing) so far in three districts[35].

In absence of above, the RSPCB could not assess the health hazard and adopt measures to control and regulate the pollutants from various sources and their harmful effects.

Secretary, Environment Department agreed and stated in exit conference that monitoring of air pollutants should be on daily basis so that improvement can be made in the system.

2.1.7.3 Joint Inspections of Air Quality Monitoring Stations

Audit along with teams from regional offices of the Board conducted joint inspection of 33 monitoring stations (27 AAQMS and 6 CAAQMS) out of total 42 Monitoring stations[36] ***(Appendix-2.3)***. Following irregularities were noticed:

Installation of Respirable Dust Samplers at unsuitable site/un approved locations

According to NAMP guidelines, a site is representative if the data generated from the site reflects the concentrations of various pollutants and their variations in the area. The station should be located at a place where interferences are not present or anticipated. In general, the instrument must be located in such a place where free flow of air is available. The instrument should not be located in a confined place, corner or a balcony. If location of monitoring station is not representative of the area, the data may not be useful for drawing any interpretation.

During joint inspection it was noticed that 12 instruments for measuring air quality at AAQMS/CAAQMS were installed contrary to the guidelines. These instruments were located close to a wall and/or surrounded by buildings, trees, water overhead tank, *etc.* which restricted free flow of air. Details are given in ***Appendix-2.4.***

Further test check of records revealed that in Jaipur, monitoring of $PM_{2.5}$ is being carried out at the campus of RSPCB, Jhalana Dungri which is an

[34] Number of PSUs retail outlets as informed by State Level coordinator- Indian Oil Corporation Limited- Jaipur.
[35] Churu (1), Dholpur (2) and Chittorgarh (23).
[36] 32 AAQMS and 10 CAAQMS (eight Analyzers were on trial)

institutional area. This area is far from dense population, free from vehicular pollution and there are no commercial and industrial activities. Also, the station was surrounded by trees. Similarly, in Jodhpur, the $PM_{2.5}$ sampler was placed in an area surrounded with trees.

Installation of the air-monitoring instruments at a non-polluting and non-representative location has the risk of generating inaccurate and non-representative result.

Unsuitable site and un approved location of Monitoring Station

Sampler was installed at corner of roof at M/s Jain Irrigation Limited, Alwar in place of approved location and surrounded by trees which was in contravention of NAMP guidelines

The NAMP guidelines state that the objective of monitoring is to measure trends in air quality and measurements are to be conducted over a long time. The site should be selected in such a manner that it remains a representative site for a long time and no land use changes, rebuildings, *etc.* are foreseen in near future.

It was noticed that in seven cases, the samplers were installed at locations other than the approved locations as detailed in ***Appendix-2.5***

No approval for change of sites was found on record. The respective ROs were continuously sending monitoring results against the names of originally approved locations. Secretary, Environment Department stated during exit conference that it was a technical issue and the guidelines of CPCB must be followed in this regard.

Other important findings during Joint Inspections

As per NAMP guidelines, information on type and number of vehicles, meteorological data with respect to temperature, relative humidity, wind speed and wind direction should be collected by RSPCB.

During the joint inspections audit observed:

- Information regarding type and number of vehicles was not maintained by any monitoring station. No assessment was made by the RSPCB in this regard even at the time of setting up of these monitoring stations.
- In all AAQMS, no measurement of meteorological data with respect to temperature, relative humidity, wind speed and direction was carried out as there was no such measuring instrument/equipment.
- Site sheltering facilities like shade for protection from rains, sunlight, *etc*. were not available in all AAQMS.
- Instruments were not calibrated by 18 AAQMS out of 27 during 2012-17. In Jodhpur, calibration was being done regularly in all six centres while in three AAQMS, Udaipur it was done only in November 2015.
- As per the NAMP guidelines, field assistants should hold masters degree in Environmental Chemistry for measurement of pollutants at AAQMS. Audit scrutiny, however, revealed that only one field assistant was a science graduate. Some had passed class 10 or class 12 only.
- There was lack of facility for power backup in all AAQMS. In AAQMS, *Sojatigate,* Jodhpur, at the time of joint inspection, there was power cut and due to lack of standby arrangement, the sampler was not operational.

2.1.8 Industrial Pollution

Industrial pollution occurs when factories (or other industrial plants) emit harmful by-products and waste into the environment. In order to contain the pollution, RSPCB provides consent to establish/ operate for each industrial unit. The main sources of industrial pollution in Rajasthan were Mining, Thermal Power Plants, Brick Kilns, Stone Crushing Industries, Cement plants *etc.* Scrutiny of records of RSPCB as well as joint inspections of industrial units revealed the following:

2.1.8.1 Industries functioning without consent

According to Section 21 of the Act, no person shall, without the previous consent of the State Board, establish or operate any industrial plant in an air pollution control area. Further, Section 17 of the Act requires the State Board to inspect air pollution control areas, assess the quality of air therein and take steps for the prevention, control or abatement of air pollution in such areas. This implied that RSPCB was required to conduct periodical surveys and coordinate with other State Government Departments like the Department of Industries to identify polluting industries.

- Industries are categorised[37] as red, orange, green and white category based on their pollution load. There were 4,29,339 units[38] registered with the Industries Department and Department of Inspection of Factory and Boilers[39]

[37] Ministry of Environment and Forest releases new categorisation of industries on dated 5 March 2016.

[38] Micro, Small and Medium Enterprises -415709, Large-366 and Factory and Boilers-13264

[39] Data based on calendar year

in the State as of March 2015[40]. However, the RSPCB did not have consolidated data of category wise number of industrial units.

The RSPCB is required to issue consent to establish for each industry other than the white category[41].

- It was noticed that during review of records in selected ROs except Jodhpur[42], 2168 'Consent to Establish' (CTE) were issued during 2012-15 by these ROs for establishment of industrial units in the cities in their jurisdiction. During the same period, 27,678 new industries, factories and boilers[43] were registered in the cities under the jurisdiction of the selected ROs as ascertained from the data of Department of Industries and Department of Inspection of Factory and Boilers. Only eight *per cent* industrial units registered were, therefore, given the consent to establish. Thus, it is evident that the industries were allowed to operate without the required 'consent to establish'.

- In joint inspections of 148 units[44] by audit team with representatives of Regional Offices, RSPCB, it was found that in 15 instances[45], industrial units were operating without even consent to establish.

Secretary, Environment Department stated during exit conference that total number of industries may not be taken into consideration as many of them may not be polluting units. However, the Government and the RSPCB accepted that the complete list of polluting industries was not available with RSPCB. Audit's view is that the RSPCB neither coordinated with the Department of Industries and Department of Inspection of Factory and Boilers nor made any other effort to identify actual number of polluting industries so that all could be brought under the consent regime.

One of the most important prerequisites to determine the action that was required to be taken to control air pollution, therefore, was not fulfilled.

2.1.8.2 Shortcoming in issuing of consent

Industrial units have to apply for renewal of consent granted to industries under Section 21 of the Act within a reasonable period[46] of its validity. As per sub-section (4), the RSPCB was required to issue consent within a period of four months after the receipt of the consent application referred to in sub section (i). Action was supposed to be taken under Section 31-A of the Act against the defaulter units if these were operating even after expiry/refusal of consent. According to Rule 15 of Rajasthan (Prevention and Control of Pollution) Rules, 1983, RSPCB was to maintain consent register in Form VIII as required under section 51 of the Act.

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[40] As per GoI's notification dated 18.9.15, every MSME shall file Udyog Aadhaar Memorandum through online including existing enterprises due to which old registered industrial units also allowed for reregistration.

[41] According to RSPCB order dated 31 May 2016, white category units are not required to obtain CTE/CTO.

[42] Information not furnished by RO, Jodhpur

[43] Data based on calendar year.

[44] Brick kilns-32, stone crusher-61 and other industrial units-55

[45] Brick kilns-10, stone crusher-2, industries-3

[46] 120 days in advance prior to expiry of previous consent.

During scrutiny of records of RSPCB Headquarter and six selected ROs, it was seen that the RSPCB did not evolve any mechanism to watch the renewal of consent after expiry of the validity period of consent issued earlier. RSPCB was unable to produce the exact number of consents expiring during the audit period. The number of industrial units in operation without consent of RSPCB could not be ascertained in absence of maintenance of data by the RSPCB.

Further shortcomings were observed as follows:

- Consolidated data regarding validity period of the consent issued to industrial units was not maintained by any selected RO except RO, Bhiwadi where 83 applications for renewal were obtained against the required 192 applications for renewal of consent during 2016-2017. No further action was found on record against those units which had not applied for renewal. Test check of 573 cases[47] of the selected ROs revealed that 74 industries[48] had run without consent to operate for periods ranging from 14 to 3038 days. Out of these, 23 units were still in operation. During joint inspection, 12 units were found operating though their CTOs had expired.

- On scrutiny of information provided by selected ROs[49], it was observed that 19 CTEs[50] and 514 CTOs[51] had either expired or were denied during the period 2012-17. The Board, however, did not evolve any mechanism to ensure that such industrial units did not operate after rejection of consent applications or expiry of validity of consent.

- In test checked 4070 consents out of 6159 CTOs issued during 2012-17 by six ROs, it was noticed that 568 'consents' were not issued within the prescribed time and the delay ranged between three and 1977 days. Further, the consents were issued with retrospective effect[52]. Delayed issuance of consents and making these effective retrospectively implied that the industrial units did not need to ensure compliance with the required conditions.

- It was also observed that consents were issued to 83 industrial units for the period before the date of filing applications. This implied that industrial units were operating without consent before the date of filing application and the RSPCB had regularized such period without ascertaining the emission norms and observance of required conditions during the period.

- Consent register was not maintained by RSPCB Headquarters and selected ROs. The purpose of consent register was to monitor information on type of operation or process, consent classification, date of installation of air pollution control equipment, emission standards and consent conditions as required under the Rules. Due to non-maintenance of consent registers, various important parameters could not be effectively monitored.

Deficiency mentioned ibid was indicative of failure to utilise the existing mechanism to monitor all the industrial units regularly.

[47] In Alwar-100, Bhiwadi-85, Jaipur (North)-95, Jodhpur- 92, Kota-114 and Udaipur-87
[48] In Alwar-8, Bhiwadi-10, Jaipur (North)-10, Jodhpur- 23, Kota-18 and Udaipur-5
[49] Except Jaipur (North) which did not furnish information.
[50] In Kota-9, Udaipur-4 and Jaipur (North)-6,
[51] In Kota-80, Udaipur-35, Jodhpur-183, Alwar-182 and Bhiwadi-34
[52] In 675 consents out of 4070 test-checked (retrospective effects ranging from four to 1983 days).

2.1.8.3 Silicosis: A threat to the life of mine workers

Silicosis is a fibrotic lung disorder caused by inhalation, retention and pulmonary reaction to crystalline silica. It is an incurable disease that results in slow and painful death. The workers of stone quarries and crushers, sand blasting, foundries, ceramic industries, gem cutting and polishing, slate/pencil, construction, glass manufacture and all mining industries are particularly prone to it due to inhalation of silica dust during their working. In order to prevent such disease wet drilling[53] measures are to be adopted in mining units.

There were about 2,548 silicosis prone mining units in the State[54] such as sand stone, quartz and silica sand.

It was seen that 7,959 silicosis cases were detected[55] out of which 32.78 *per cent* cases pertained to Jodhpur district during January 2015 to February 2017. In Five districts[56] the number of silicosis patients detected and the number of deaths during 2013-17 were as under:

Table: 1 Number of detection and death cases of silicosis

Year	Number of silicosis cases detected	Number of affected persons who have died
2013-14	304	01
2014-15	905	60
2015-16	2,186	153
2016-17	1,536	235
Total	4,931	449

Source: Office of State/District T.B. Officer, Medical and Health Department.

The data given in above table raises serious concern regarding management of silicosis.

2.1.8.4 Lack of robust enforcement in mining units to contain silicosis

The Rajasthan State Human Rights Commission (RSHRC) prepared a special report (December 2014) on the matter of prevalence of silicosis amongst workers employed in mines in Rajasthan and sent it to the Ministry of Labour and Employment (MoLE), Government of India with a direction to take action on the recommendations contained therein.

The MoLE forwarded (September 2015) the recommendations of RSHRC to the Director, Department of Mines and Geology (DMG), Rajasthan and Member Secretary (MS), RSPCB for further action on the recommendations related with them. The MS, RSPCB sent (November 2015) a reply to the Deputy Registrar, RSHRC, according to which the RSPCB had committed to

[53] Wet drilling means use of drills either operated with dust extractors or equipped with water injection system.

[54] Source: data uploaded on website of Department of Mines and Geology, Udaipur

[55] According to information provided by the Director (Public Health), Medical and Health Service, Rajasthan.

[56] Alwar, Jaipur, Jodhpur, Kota and Udaipur.

carry out Ambient Air Quality Monitoring periodically near clusters of mines/quarries. The RSPCB sought (May 2016 and September 2016) the details of mining clusters located in the State from DMG but the details were not provided by the DMG to the RSPCB (April 2017). In absence of this, the RSPCB had neither prepared any plan for frequency of inspection nor had started ambient air monitoring nearby mining clusters.

The Director, Mines and Geology, Udaipur had also submitted (December 2014) Action Taken Report on the recommendations. According to a recommendation of RSHRC, flying squads consisting of officers of Mining Department and RSPCB were to be constituted. The DMG wrote (January 2015) to the Principal Secretary, Mines and Petroleum, GoR for constituting joint teams consisting of respective Mining/Assistant Officers and Regional Officers, RSPCB. However, no joint flying squad was constituted even after lapse of two years (May 2017).

Significant findings relating to mining activities in Rajasthan are discussed separately in chapter 3.1.

Emissions by Thermal Power Plants

Thermal Power Plants (TPPs) are highly polluting and are classified under 'Red' category. The power plants cause air pollution due to excess emission of Particulate Matter and other gases. Two[57] out of seven[58] coal based TPPs were selected for joint inspection.

Kota Thermal Power Plant is Rajasthan's first major coal-fired power plant. It is located on the east bank of the Chambal River near Kota. There were seven units in Kota Super Thermal Power Station (KSTPS) having capacity of 1240 Megawatt (MW). Chhabra Thermal Power Plant (CTPP) is located at Chowki Motipura in Baran district. There were four units in CTPP with 1000 Mega Watt capacity. During review of records relating to these Power Projects, the following issues were observed:

2.1.8.5 All units were operating without obtaining CTO/renewal of CTO

Prior consent of the RSPCB is mandatory for establishing or operating industrial plant in an air pollution control area.

Review of records of CTPP indicated that the Units I and II were granted CTO up to 31 August 2015, Unit III was granted CTO up to 30 November 2014 and Unit IV had started production with effect from 30 December 2014 but it did not have the required CTO from the RSPCB (April 2017). Thereafter, CTOs of these units were not renewed. As a result, all the four units were operating without CTOs. Reply from the RSPCB is still awaited.

Further, it was observed that the KSTPS was granted CTO for the period from 1 July 2013 to 30 June 2015 for all seven units. The consent applications for renewal submitted (27 February 2015) by the KSTPS were still (April 2017)

[57] Kota Thermal Power Plant (Kota) and Chhabra Thermal Power Plant (Baran)

[58] Suratgarh (Sriganganagar), Kota (Kota), Barmer (Barmer), Motipura (Baran), Barsingsar (Bikaner), Gurha (Bikaner) and Thumbli (Barmer)

pending with the RSPCB due to non-compliance with the conditions such as non-operation of Air Pollution Control Machines (APCMs) installed at coal yard and coal crusher, non-interlocking of all units of Electrostatic Precipitators (ESPs) and lack of details about detection range, calibration, frequency, signals, linear factors, *etc.* The RSPCB in exercise of the powers conferred upon it under the provisions of Section 31-A of the Act issued (5 November 2015 and 12 January 2017) show cause notices[59]. The reply of the last show cause notice was still awaited (April 2017). However, the plants were being continuously operated. Thus RSPCB failed to take action under Section 37 of the Act against KSTPS for not complying with the directions issued under Section 31-A. As a result, excess emission continued from KSTPS as detailed in the succeeding paragraph.

2.1.8.6 Excess emission

Scrutiny of the stack and ambient monitoring reports revealed that the emission level of Particulate Matter and RSPM exceeded the prescribed level.

All the seven units of KSTPS had pollution control arrangements and ESP to arrest the fly ash, yet the prescribed standards of Particulate Matter (150 mg/Nm^3) and RSPM (100µg/m^3) could not be achieved by the units as Particulate Matter remained between 174 and 952mg/Nm^3 and RSPM remained between 110 and 202µg/m^3 for the period 2012-13 to 2016-17. It was observed from the records of KSTPS that the ESPs were not working efficiently[60].

Though RSPCB had issued show cause notices to KSTPS, no effective steps to improve efficiency of ESPs were taken by the KSTPS.

2.1.8.7 Disposal of fly ash

Coal ash is the waste that is left after coal is combusted. It includes fly ash[61] as well as coarser materials that fall to the bottom of the furnace. Coal ash mainly comes from coal-fired electric power plants.

Ministry of Environment and Forest (MoEF) issued (November 2009) notification for 100 *per cent* utilization of Fly Ash by all Coal/Lignite based Thermal Power Stations in the country in a progressive manner. The Thermal Power Stations which were in operation before the date of notification were required to achieve the target of Fly Ash utilization in five years from the date of issue of notification. The new Thermal Power Stations coming into operation after the MoEF's notification were to achieve the target of Fly Ash utilization in fourth year from their date of commissioning. This condition was incorporated in the CTO and RSPCB had to ensure compliance.

Scrutiny revealed that in KSTPS, 330000 MT fly ash was lying as of April 2013 which was reduced by 48.37 *per cent* and 170371 MT fly ash remained

[59] Due to intense fugitive emissions of coal dust, non-providing acoustic enclosures with Diesel Generating sets, unavailability of infrastructural monitoring facility with the boiler, non-maintenance of log books of operation of APCMs *etc.*

[60] Many fields of ESP were out of charge on regular basis.

[61] fine powdery particles that are carried up the smoke stack and captured by pollution control devices.

in balance as of March 2017. Thus, the MoEF notification was not complied with. During review of records in CTPP, it was observed that the fly ash and bottom ash disposal in CTPP during 2010-11 to 2016-17 (up to September 2016) was 42.12 lakh MT against the generation of 48.76 lakh MT during the same period. About 6.64 lakh MT of ash, therefore, remained in the ash ponds.

2.1.8.8 Joint Inspection Findings

During joint inspection by audit team along with the Regional Officer, RSPCB, Kota, the following shortcomings in KSTPS and CTPP were noticed which were against the CTO conditions:

- Intense fugitive emissions of coal dust were observed in KSTPS while in CTPP, intense fugitive emission of coal dust was observed in and around factory premises. Coal was stored at open places. At some places, coal was burning due to which smoke emission was observed.
- Diesel Generating sets were not provided with acoustic enclosures for containing noise in KSTPS.
- Infrastructural monitoring facility was not provided with the Boiler in KSTPS.
- Log books of operation of APCMs were not being maintained in KSTPS.
- Infrastructural facility for monitoring of stack emission was not available at Unit VI of KSTPS and, therefore, no stack sample of this unit was collected and analysed by the RSPCB.
- There was no ambient air monitoring station at the periphery of the factory premises of CTPP. Only one mobile van was available for this purpose.
- Plantation was not carried out as per norms in CTPP.

Inspection reports of the Regional Officer, Kota also confirmed these observations.

The RSPCB thus failed to take concrete steps under Section 31-A. against the high polluting units which continued violating the consent conditions.

During exit conference RSPCB stated that although the Power Plants were not complying with all the norms, keeping in view their criticality it was not feasible to shut them down. Audit is of the view that RSPCB must continue to make concerted efforts to improve compliance with environmental norms in the plants.

Brick Kilns

2.1.8.9 Pollution from brick kilns

Clay bricks are produced in Rajasthan in small or cottage scale brick kilns. The raw materials in the brick kilns include topsoil, coal, paddy husk, fly ash, wood & locally available agro wastes to some extent. Brick manufacturing process generates emissions which consist of mainly coal fines and dust particles. Coal fines and dust particles are health hazards and these pollutants weaken the immune system of human beings. Brick kilns are orange category units.

The RSPCB prepared a draft guideline for abatement of pollution in brick kilns industry and uploaded it on its website in 2012. However, the RSPCB had not approved this guideline so far.

The RSPCB did not have any consolidated data about number of brick kilns that were covered under consent mechanism. The RSPCB was also unable to ascertain the actual number of brick kilns operating in the State in absence of any survey/study conducted to identify these units.

Scrutiny of information provided by RO, Jaipur (North), disclosed that 33 brick kilns had not even applied for CTEs and CTOs. No concrete steps were taken against these units. In 32 cases, though CTOs had expired during September 2002 to December 2015, no application for renewal of consent was submitted. In course of joint inspection, four of these 32 units were found operational. There were 16 brick kilns which had taken CTEs but had not applied for CTOs. The RO (North) Jaipur replied that due to shortage of manpower, no survey was done and, therefore, operating status of brick kilns was not available. Thus, there was no mechanism to check the operating status of brick kilns.

Further, scrutiny of inspection reports revealed that closure notices were issued to three brick kilns by two ROs[62] as these kilns were operating unauthorizedly after expiry of validity of CTOs. However, all three units were found operating regularly during inspections by the ROs despite the fact that closure notices were issued to them about six years ago.

Member Secretary, RSPCB stated during exit conference that brick kilns are located even in villages and it is not possible for the RSPCB to carry out air monitoring of the same as per prescribed monitoring frequency. However, the RSPCB may look into the option of getting the air quality monitoring conducted through third party.

Stone crushing industry

2.1.8.10 Control of air pollution from stone crushing industry

Stone crushing industry is classified under Red category and the main pollutants arising from this industry are SPM and RSPM. MoEF prescribed standard of SPM to be not more than 600µg/m^3 at a distance between three and 10 meters from any process equipment. There were 644 stone crushers in selected ROs. However, the ROs were not aware of the functional status of the stone crusher units. Besides, ROs had not maintained data regarding number of inspections done of stone crusher units and ambient samples analysed.

Scrutiny of files in RO Udaipur revealed that a special joint inspection carried out by the team of District Collector with the officials of RSPCB had observed that in seven cases, the SPM level had exceeded the prescribed limits (600 µg/m^3) and ranged between 2286 and 4685µg/m^3. The RO served show cause notices to all seven units and issued closure directions to two units. In response to the show cause notices, the units replied that compliance with the observations had been made. However, the RO renewed CTO without

[62] Alwar and Bhiwadi

ensuring adherence to the norms as no further sample analysis report was found on record.

Member Secretary, RSPCB accepted the facts and stated during exit conference that stone crushers are located at industrial areas and on converted revenue land also. Therefore, the concerned authorities like Industries Department, Revenue Department or Rajasthan State Industrial Development and Investment Corporation Limited (RIICO) may inform the RSPCB while granting the permission for establishment of stone crusher so that RSPCB may take necessary action.

2.1.8.11 Joint Inspection Findings of Cement, Brick Kilns and Stone Crushing Industries

In test checked ROs, six out of 30 cement plants, 32 out of 332 brick kilns, 61 out of 644 stone crushing units and 49 other industrial units were jointly visited by audit team along with the representative of respective ROs. Out of these 148 units, findings related to cement, brick kilns and stone crushing units are discussed below while findings related to Thermal Power Plants were discussed earlier. No significant issues were observed in other industrial units except three units[63] where industrial plants were operating without obtaining consent to establish.

The findings noticed were against the provisions of the Act and CTO conditions as mentioned below:

- Plantation was inadequate in 77 industrial units[64].
- In one cement plant, raw materials were lying in open area while in two other cement plants, raw materials were partially lying in open areas.
- In one cement plant, internal road was rough due to which intense fugitive emission was observed while in another cement plant road was partially rough.
- Water sprinkling was not done in two cement plants. In one cement plant water sprinkling was partially done. In 46 stone crushing industries, water sprinkling systems were not in operation.
- No air pollution measuring device was installed in one cement plant.
- 10 units of brick kilns and two stone crushers were operating without obtaining CTE while eight brick kilns and four stone crushers were in operation despite the fact that validity of the CTO issued to these units had expired or were refused.
- Infrastructure facilities for stack monitoring were inadequate in 22 brick kilns of Jaipur district.
- In 28 brick kilns, inspections were not carried out and stack samples were not taken and analysed by respective ROs.
- Dust containment cum suppression systems did not exist in 53 stone crushing units.

[63] M/s Marwar Chemical. Jodhpur, M/s Om Chemical and Mineral, Jodhpur and M/s Raj Art and Handicraft, Jodhpur.

[64] One cement industry, 30 brick kilns and 46 stone crushing industries.

- In 45 stone crushing units, the approach roads were without hard surfaces.
- Wind breaking walls were not constructed in 41 stone crushing units.
- In 16 stone crushing units, water storage capacity with minimum 3000 litre was not available.
- In 45 stone crushing units, ambient air monitoring was not done.

If the conditions, subject to which CTO has been granted were not fulfilled, the consent should have been cancelled before the expiry of the period for which it was granted or further consent should have been refused after such expiry under Section 21 (4) of the Act. However, the RSPCB did not take any concrete action except issuing notices.

Member Secretary, RSPCB accepted the audit observation in exit conference.

During test check of records it was however also seen that Ultra Tech Cement plant in Jaipur was operating efficiently and was complying with the emission norms.

Besides above, scrutiny of records of Regional Office, Alwar, revealed that not even a single report of health check-up of workers related to three metal industries was found on record. According to conditions mentioned in CTOs, the industrial units were required to periodically examine the industrial workers at least once in a year for lead level in blood as well as urine. Persons found having higher lead level were required to be shifted immediately to non-lead activity areas and given special treatment till the lead levels returned to an acceptable level (10μg/m^3).

This indicated that the industrial units as well as Regional Officer, RSPCB were not sensitised adequately about the adverse impact of lead on health of workers of metal industries.

2.1.9 Crop residue burning

Crop residue burning is one among the many sources of air pollution. It results in the emission of smoke which if added to the gases present in the air like methane, nitrogen oxide and ammonia, can cause severe atmospheric pollution. These gaseous emissions can result in health risk, aggravating asthma, chronic bronchitis and decreasing lung function.

Government of Rajasthan after consultation with the RSPCB issued (August 2015) a notification regarding prohibition of burning of left over straw in whole of Rajasthan State.

During review of records of the RSPCB, it was found that the National Green Tribunal (NGT) in its decision regarding application number 118/2013 had ordered (December 2015) that all the State Governments and the Pollution Control Boards should ensure that small land holding farmers are provided with machines for extracting agricultural crop residue in their respective fields, the State Governments should, in coordination with Indian Space Research Organization, National Remote Sensing Agency and State Remote Sensing Agency, develop real time monitoring mechanism.

The RSPCB issued (January 2016) directions to the Principal Secretary, Department of Agriculture, GoR under Section 31A of the Act to curb air pollution due to biomass burning and sought an action plan and compliance report so that same could be submitted to the CPCB. However, no action plan as required by the RSPCB was submitted (April 2017) by the Agriculture Department.

Besides, the RSPCB had no data of burning of crop residue during 2012-16 in the State. It could not be ascertained whether the RSPCB was monitoring the pollution from burning of agricultural residue properly.

During exit conference RSPCB stated that this was a very small issue for Rajasthan as this practice was not widely prevalent in the State. Reply may be viewed in the light of the fact that the Commissioner and Special Secretary, Agriculture raised (February 2016) a demand of ₹ 6.50 lakh on the RSPCB for conducting study of crop burning area through Satellite Remote Sensing Technology on the proposal of State Remote Sensing Application Centre, Jodhpur. However, the RSPCB had not released any funds for this purpose (April 2017) for which reasons were not found on record. As a result, neither the RSPCB nor the Agriculture department was in a position to identify the actual locations and number of cases of crop burning.

2.1.10 Vehicular pollution

Under Section 20 of the Act, the Transport Department was authorized to control vehicular pollution. The major vehicular pollutants are carbon monoxide, nitrogen oxides, photochemical oxidants, air toxics namely benzene, aldehydes, 1-3 butadiene, lead, particulate matter, hydrocarbon, oxides of sulphur and polycyclic aromatic hydrocarbons. While the predominant pollutants in petrol/gasoline driven vehicles are hydrocarbons and carbon monoxide, the predominant pollutants from the diesel based vehicles are oxides of nitrogen and particulates.

2.1.10.1 Lack of strategic planning for re-registration/renewal of 15 years old vehicles

As a result of amendments (March 2002) in the Motor Vehicles Act, 1988, the registration of all transport vehicles in Rajasthan was made valid for 15 years. Further, under Rule 4.2A (inserted in March 2003) of Rajasthan Motor Vehicles Rules, 1990, a transport vehicle shall not be deemed to be validly registered after the expiry of 15 years from the date of its first registration until the vehicle is re-registered. The Transport Department in its order (September 2016) had initiated action in two phases. In first phase[65], action was to be initiated against all category of vehicles which were registered up to March 2001 and in second phase, action was to be taken on regular basis against all category of vehicles which were registered after March 2001. The Transport Department, therefore, did not take adequate measures for more than 14 years towards implementation of the provision as regards re-registration or renewal of 15-year-old vehicles. It set (December 2016) the target for re-registration or

[65] Action of first phase was to be completed by 15 May 2017.

renewal of 1.47 lakh vehicles only against the 29.40 lakh vehicles registered up to 31 March 2001.

Thus, Transport Department failed to phase out the 15-year-old vehicles.

District Transport Officer stated in exit conference that re-registration process was under consideration and it would be implemented soon.

2.1.10.2 Vehicular pollution load was not assessed

Estimation of emission loads is an essential step in order to estimate the share of various sources in the total emission load in a region. It also helps in understanding the potential of various strategies in reducing the emission loads in a region.

Review of records of Transport Department revealed the following:

- The Transport Department neither conducted any study/survey to identify the places of heavy traffic nor pollution load was assessed in major cities of the State.
- The Transport Department failed to prepare a comprehensive plan or strategy to reduce pollution load in the major cities in absence of reliable and relevant data.

The Additional Transport Commissioner (ATC) Pollution Control (PC) admitted (April 2017) that no comprehensive plan was prepared during 2012-17 to minimize the vehicular pollution load but efforts were being made to control vehicular pollution such as grant of full tax rebate to all battery operated vehicles and 50 *per cent* rebate on special road tax to LPG/CNG operated vehicles. Besides, in order to bring transparency and uniformity, all PUC centres were being connected with networking.

2.1.10.3 Fleet modernization programme not initiated

According to Rajasthan State Environment Policy, 2010, fleet modernization program was to be initiated in which subsidies/direct cost benefits were to be provided to the old commercial vehicles owners to switch from old to new vehicles. Scrutiny revealed that:

- no such programme was initiated by the Transport Department in which subsidies/direct cost benefits were offered to the old commercial vehicle owner for switching to new vehicle.
- the policy to introduce fleet modernization programme, therefore, did not take off.

Thus, the Department failed to phase out 15 years old vehicles in absence of adequate planning for re-registration/renewal of old vehicles.

2.1.10.4 Pollution testing apparatus not provided to flying squad

Scrutiny of records revealed that:

- in Rajasthan, there were 22 Pollution Flying Squads (PFS) covering 10 out of 12 regions for monitoring of polluting vehicles. Two regions[66] comprising six districts had no PFS.
- the flying squads except one in Udaipur were not provided any apparatus to check the emission level of visibly polluting vehicles. The data about the numbers of vehicles checked and found emitting excess pollutants was not available with the flying squad in Udaipur though it had the required apparatus.
- the Transport Department agreed that there was no data of number of vehicles which were found emitting excess pollutants during inspections by the flying squads.

District Transport Officer stated in exit conference that decision has been taken to provide PUC mobile vans to flying squad to check the visibly polluting vehicles.

2.1.10.5 Pollution Under Control Certificates

It is important to check and thereby control emissions during the entire useful life of a vehicle. Every motor vehicle is required to carry a valid "Pollution Under Control Certificate" issued by the Transport Department or by any Pollution Checking Center authorized by the Transport Department.

A *motoryaan pradushan janch kendra* scheme was introduced in the year 2005. Under this scheme, the PUC certificate was being issued for six months to petrol and diesel vehicles after achieving the prescribed compliance standards.

Review of records revealed that:

- there was no provision for setting up of PUC centres based on the number of registered vehicles. There were 1.36 crore registered vehicles of different categories as of March 2016 in the State. The Transport Department had authorized only 1159 Pollution Check Centres (PCC) as of March 2017.
- data regarding actual number of vehicles plying on the road was not available with State Transport Department.

However, PUC certificates issued during 2012-13 to 2016-17 as against total number of vehicles registered in the State were as under:

[66] Dausa and Sikar

Table 2: Number of PUC certificates issued in the State during 2012-17

(In lakh)

Year	Vehicles registered (upto 1st April of each year)	Number of PUC Certificates to be issued as per norms	PUC Certificates issued during the year	Number of PUC Certificates not issued as per norms (Percentage)(3-4)
(1)	(2)	(3)	(4)	(5)
2012-13	89.86	179.72	4.26	175.46 (97.63)
2013-14	100.72	201.44	3.85	197.59 (98.09)
2014-15	111.84	223.68	3.78	219.90 (98.31)
2015-16	123.79	247.58	9.66	237.92 (96.10)
2016-17	136.32	272.64	-NA-	-NA-

Source: Transport Department, Rajasthan

No mechanism was evolved by the Transport Department to watch the expiry of PUC issued to vehicles. It did not have the database for monitoring the issuance of PUCs and ensuring that all the vehicles come for the emission testing, whenever due. Further, data regarding number of vehicles which failed the pollution testing at PUC centres due to excess emission was not produced by test checked RTOs except at Jaipur and Udaipur. In Jaipur, 12141 and in Udaipur, 14820 vehicles were found polluting the air beyond prescribed limit and these were not issued PUC certificates by the PUC centres However, the Transport Department did not evolve any mechanism to watch whether these vehicles had obtained PUCs after taking corrective measures.

The Transport Department stated that there was no penal provision for defaulters. It added that all PUC centres were being connected through networking to generate data and an agreement had been signed with the Rajasthan Electronics and Instruments Limited (October 2016) for networking of all PUC centres. It is also stated that old vehicles plying on roads are not more than five *per cent.* Reply is not convincing as there was no mechanism to assess the actual number of vehicles are plying on roads.

2.1.10.6 Anomalies found during Joint Inspection of PUC centres

A joint team (consisting of officials of the Transport Department and Audit) visited 120 out of 427 Vehicle Pollution Emission Testing Centres in five test checked districts. Against the provisions of CMVR, 1989 and *Motoryaan Pradushan Janch Kendra Scheme, 2005,* the following deficiencies were noticed:

- Probe was not inserted properly during testing of vehicles in 12 centres. Besides in nine centres, reading was not taken five times while checking diesel vehicles.

- No Type Approval certificates[67] were available in 71 centres.
- Information about complaint/suggestion book was not displayed and these were not maintained in 65 centres.
- In case of pollutants found above the prescribed limit, there was no facility of tuning or fuel mixture adjustment in 73 centres.
- In eight centres, PUC certificates were being issued by an unauthorized signatory.
- Data regarding number of vehicles issued PUC certificates was not maintained by 11 centres and quarterly reports were not submitted by 19 centres to the Transport Department.
- Annual Maintenance Contract and regular calibration was not being done in 13 cases.
- In 79 centres, the complaint post cards were not available and the information was also not displayed.
- No training was imparted to 41operators of PUC centres.
- In 10 instances[68], PUC certificates were issued by the operator of PUC centres without testing of vehicles. In Udaipur, one centre was generating computerised certificates on plain paper from computer while these should have been issued on stationery allotted from Rajasthan Petroleum Dealers Association.
- The Transport Department had issued licences without verifying the site and equipment of PUC centres. It was found that 20 licensees had not installed equipment but they had the requisite licenses from the Transport Department.

2.1.10.7 Inspections of PUC centres not carried out regularly

According to *Motoryaan Pradushan Janch Kendra Scheme 2005*, every PUC centre is required to be inspected twice in a year by the transport officials not below the rank of sub-inspector and inspection report has to be submitted to the respective RTOs.

The Transport Department had not maintained compiled data of number of inspections of PUC centres made by the departmental officials. In test checked RTOs/DTOs, the data relating to inspections conducted during last five years was not made available to audit. The position of inspections of PUC centres during 2016-17 was as under:

[67] According to rule 116 (3) of CMVR, 1989, the pollution testing meter should be typed approved by any agency referred in rule 126 or National Environmental Engineering Research Institute.

[68] Alwar-02, Kota-04, Jodhpur-02 and Udaipur-02.

Table: 3 Position of inspections of PUC centres conducted during 2016-17

Name of RTO/DTO	Number of			Shortfall	Percentage of shortfall
	PUC centres	Inspections required	Inspections carried out		
Alwar	47	94	Nil	94	100
Jaipur	179	358	NA	NA	NA
Jodhpur	141	282	15	267	95
Kota	22	44	22	22	50
Udaipur	38	76	05	71	93

Source: Regional/District Transport Offices

Owing to inadequate inspections of PUC centres, the functioning of PUC centres was not satisfactory as discussed in the paragraph above. The Board/Transport Authority had also not been conducting quality control tests of service stations authorised to issue PUC certificates.

2.1.11 Management Information System

During the scrutiny of records, it was seen that the Management Information System of the RSPCB was poor as discussed below:

2.1.11.1 Delay in preparation of Annual Report

Section 35 (2) of the Act envisaged that every State Board during each financial year would prepare an annual report giving full account of its activities during the previous financial year and copies thereof were also to be forwarded to the State Government within four months from the last date of previous financial year and such report was required to be laid before the State Legislature within a period of nine months from the last date of the previous financial year.

It was observed that preparation of annual report and its submission to the State Government was delayed as evident from the details mentioned below:

Table: 4 Submission of Annual Report to the State Government

Financial year	Date of submission of annual report to the State Government	Delay in submission of annual report	Date of laying in Assembly
2012-13	07-01-2016	2 years 5 months	-NA-
2013-14	01-03-2016	1 year 7 months	-NA-
2014-15	16-03-2017	1 year 7 months	21-03-2017
2015-16	23-03-2017	7 months	24-03-2017

Source: RSPCB Jaipur.

It was also interesting to note that the annual report for the period 2010-11 gave full account of the Board's activities under various Acts but from 2011-12 onwards, the annual reports were sketchy and important information regarding number of category wise applications of consents received and disposed during the year, RO wise number of stack and ambient samples

analyzed, trend of annual average of ambient air quality monitoring through bar charts, action taken against polluting units, *etc*. were missing from the report.

2.1.11.2 Statutory Audit not conducted

➢ The RSPCB is required to prepare Annual Accounts at the close of each financial year and get the same audited by a qualified Auditor appointed by the State Government on the advice of the Comptroller and Auditor General of India. Further, such auditor shall send a copy of his report along with an audited copy of the accounts to the State Government for laying before the state legislature.

It was observed that the annual accounts were not audited by qualified auditor since 2002. In this regard, a resolution was passed in Board meeting (October 2015) that statutory audit be carried out within a period of six months. However, no action was taken till the date of next meeting (July 2016) when it was again resolved that statutory audit be carried out within a period of six months. However, the statutory audit of the Annual Accounts was not carried out so far (April 2017). The RSPCB, therefore, failed to perform its mandatory function in a timely manner.

2.1.11.3 Manpower Management

It was mentioned in the State Environment Policy 2010 that the RSPCB had reviewed its staffing and found that the per district scientific and technical staff ratio was the lowest in RSPCB among the State Pollution Control Boards compared; the per lakh population ratio was the lowest in RSPCB; the per 1000 square kilometer technical and scientific staff ratio was the lowest in RSPCB; and the number of industries handled by the technical and scientific staff was the highest in RSPCB. Recognizing these issues, a rigorous program of strengthening of the Board was underway, including sanctioning of new posts.

The position of sanctioned, person-in-position (PIP) and vacant posts in the RSPCB during 2011-12 to 2016-17 was as under:

Table : 5 Person in position against sanctioned posts in the RSPCB during 2011-17

Year	Number of sanctioned posts	Person in position	Number of vacant posts	Percentage of vacancy
2011-12	363	284	79	21.76
2012-13	363	280	83	22.87
2013-14	371	274	97	26.14
2014-15	370	275	95	25.68
2015-16	387	262	125	32.29
2016-17	394	260	134	34.01

Source: RSPCB, Jaipur.

It could be seen that the percentage of vacant posts increased steadily from 21.76 in 2011-12 to 34.01 in 2016-17. As of March 2017, PIP of technical and scientific posts was 152 against sanctioned post of 205 and the vacancy was 53 (25.85 *per cent*). The PIP position in the RSPCB, had affected the inspection and monitoring of air polluting units as discussed in previous paragraphs. Secretary, Environment Department in exit conference directed Member Secretary, RSPCB to put forth the man power restructuring proposal on priority.

It is not evident from the records produced to audit whether the requirement of its manpower was assessed on the basis of number of districts, population and area covered and number of industries under consent management. No reply was also furnished to audit.

2.1.11.4 Enforcement

As per section 31-A of the Act, the State board may, in the exercise of its powers and performance of its functions under this Act, issue any directions in writing to any person, officer or authority, who shall be bound to comply with such directions regarding:
(a) the closure, prohibition or regulation of any industry, operation or process, and
(b) the stoppage or regulation of supply of electricity, water or any other service.
Information regarding details of defaulter units and there against closure orders issued by the RSPCB during 2012-13 to 2016-17 in compliance of section 31-A of the Act were called for but no consolidated data of closure orders issued by the RSPCB were furnished to audit. However, as per Annual Reports of RSPCB, closure directions during 2012-13 to 2015-16 were issued as under:

Year	2012-13	2013-14	2014-15	2015-16
No. of closure directions	158	115	414	171

Besides above, RSPCB had issued 302 closure direction jointly under section 31-A of Air Act and 33-A of Water (Prevention and Control of Pollution) Act, 1974, during 2012-13 to 2015-16.

However, no concrete follow-up action on these directions were found on record as discussed earlier.

2.1.12 Monitoring

2.1.12.1 Huge shortfall in conducting inspection of air polluting industries

According to Section 17 of the Act, the RSPCB has been empowered to inspect, at all reasonable times, any control equipment, industrial plant or manufacturing process and to give, by order, such directions to such persons as it may consider necessary to take steps for the prevention, control or abatement of air pollution.

RSPCB prepared (April 2015) an operating manual for scientific and technical group and instructed all scientific and technical officers to execute the work according to this manual. As per the operating manual, 17 Category units, Red Category (Large and Medium) units were to be inspected once in six months with 50 *per cent* inspections by Regional Officer; Red Category (Small), Orange Category (Large and Medium) units were to be inspected once in a year with 10 *per cent* inspections by Regional Officer; and Orange Category (Small) units were to be inspected once in two years. Prior to this operating manual, inspection norms for inspections were fixed in August 2001 by the RSPCB. The Regional Offices, however, maintained the data only according to the nature of category like red, orange and green and not according to size *viz.* large, medium and small. Further, no year wise targets for inspections were allotted to any RO by RSPCB (Headquarter).

In absence of availability of data according to the norms fixed for inspection, analysis of 17 category highly polluting units was conducted in four test-checked ROs[69]. Two ROs[70] did not furnish the required information to audit. The details are as follows:

Table: 6 Number of inspections of highly polluting industries carried out in test checked four Regional Offices

Year	Total number of 17 category units	Number of inspections required	Number of inspections carried out	Shortfall in inspection (percentage)
2012-13	60	120	48	72 (60)
2013-14	65	130	63	67 (52)
2014-15	66	132	68	64 (48)
2015-16	66	132	56	76 (58)
2016-17	66	132	60	72 (55)
Total	**323**	**646**	**295**	

Source: Regional Offices, RSPCB

Shortfall in conducting inspection of highly polluting industrial units during 2012-17 ranged between 48 and 60 *per cent*. It was observed from records in respect of other category units that inspections were carried out as and when the units applied for consent or on the basis of complaint received against the units. RO, Alwar attributed (April 2017) the reasons for shortfall to non-availability of staff and basic facilities. The reply was not tenable as RSPCB was responsible to strengthen manpower and basic facilities and it failed to do so.

The mechanism for regular inspections which were necessary for taking adequate steps for prevention and control of air pollution was, therefore, deficient.

Member Secretary, RSPCB agreed about shortfall of inspection and stated that risk based module has now been developed and inspection targets are available in software.

[69] Alwar, Bhiwadi, Kota and Udaipur.
[70] Jaipur (North) and Jodhpur.

2.1.12.2 Inadequate sampling

According to the provisions of Section 22 of the Act, no industrial or processing unit or person can discharge into air, emissions containing environmental pollutants in excess of prescribed standards. RSPCB was to ensure compliance with this provision by drawing the samples of emissions and analyzing the same. The details regarding number of samples to be drawn and analyzed on the basis of number of industries in operation in the State were not maintained by the RSPCB. However, it was observed in selected ROs that the number of stack samples drawn and analysed were less than the numbers of consent to operate issued during 2012-13 to 2016-17. Information provided by five ROs[71]disclosed that 1846 stack samples were collected and analysed during 2012-17 whereas 6159 CTOs were issued during the same period by these ROs. Further, it was observed that no targets were fixed for laboratories to achieve the norms. It was observed that the number of stack samples analysed by Central Laboratory decreased by 50 *per cent* in 2016-17[72] compared to 2012-13[73]. RO, Alwar stated (April 2017) that due to shortage of staff, sample analyses could not be done as per norms. Reply was not tenable as RSPCB was required to strengthen manpower.

Inadequate sampling and analysis resulted in diluting the enforcement mechanism to prevent and control discharge of emissions beyond the prescribed level.

2.1.12.3 Inadequate number of meetings of the Board

According to Section 10 (1) of the Act, the RSPCB was required to meet at least once in every three months and was to observe such rules of procedure in regard to the transaction of business at its meetings as may be prescribed. During review of the Board's record, it was noticed that during the period from 2012-13 to 2016-2017, only eight meetings were held as against required 20 meetings by the RSPCB. The attendance of members in these meetings ranged between 35 and 59 *per cent* only. Except for the Chairman and Member Secretary of the RSPCB, attendance of other members in the meetings was irregular. The Mayor, Municipal Corporation, Jodhpur, who was nominated for the period from 19 April 2011 for three years, was not present in five consecutive meetings[74]. The Commissioner, Transport Department who has a major responsibility to control vehicular pollution attended only two meetings of the Board while his representative attended another two meetings. The State Government did not take action against the absentee members in accordance with Section 7(4) of the Act, 1981 by terminating their membership from the Board.

The RSPCB replied (May 2017) that nomination of the members of non-government and local bodies was not done by the Environment Department, GoR between 19 April 2014 and 27 July 2016 which led to less attendance in the Board's meeting.

[71] Information not furnished by RO Jodhpur.
[72] 114 samples analysed
[73] 232 samples analysed
[74] Held during May 2012 to September 2013.

Member Secretary, RSPCB agreed about shortfall of board's meeting and stated that Government has appointed the nominated members and in future the number of meetings will be increased.

2.1.13 Conclusion

- RSPCB did not prepare comprehensive programmes for prevention, control or abatement of air pollution. The source apportionment studies were not carried out in the State to identify the sources of pollution along with their quantification.

- As of March 2017, 32 AAQMS and two CAAQMS were operating in six districts while 27 districts having 47.03 million population and 74.50 lakh vehicles were still out of the purview of air quality monitoring.

- The RSPCB and the Environment Department do not have any meaningful data of the sources of pollution in rural areas.

- RSPCB does not have consolidated data of category wise number of industrial units covered under consent mechanism in the State. The samplers were installed at locations other than approved locations and instruments for measuring air quality at AAQMS/CAAQMS were installed in violation of the guidelines. As per NAMP guidelines, information on type and number of vehicles, meteorological data with respect to temperature, relative humidity, wind speed and its directions should have been collected by RSPCB. However, this Information neither was collected by RSPCB nor was maintained at all 27 AAQMS test checked.

- RSPCB had neither conducted any survey nor coordinated with other departments to effectively discharge its regulatory functions to cover all industrial units under its consent mechanism.

- During joint inspections of 148 units by audit team along with representatives of Regional Offices, RSPCB, it was found that many industrial units were operating without even consent to establish.

- The RSPCB did not evolve any mechanism to watch the renewal of consent to operate after expiry of the validity period of consent issued earlier.

- The RSPCB had not taken any proactive steps to prevent silicosis amongst the workers.

- Transport Department also failed to prepare an action plan to phase out the 15 years' old vehicles. The Monitoring of PUC centres was weak and no follow up action was taken to ensure that these centres were functioning as per prescribed norms.

- The Transport Department neither conducted any study/survey to identify the places with heavy traffic nor pollution load was assessed in major cities of the State.

- Manpower management in RSPCB was poor. The vacancies were steadily increasing thus impacting the effective functioning of the Board.

- Shortfall in conducting inspection of highly polluting industrial units during 2012-17 ranged between 48 and 60 *per cent* and the number of stack

samples analysed by Central Laboratory reduced by 50 *per cent* in 2016-17 when compared to the year 2012-13.

- During the period from 2012-13 to 2016-2017, only eight meetings of the Board were held as against required 20 meetings.

2.1.14 Recommendations

- *RSPCB should conduct source apportionment studies in all major cities to identify the quantum of pollution from various sources. Accordingly, comprehensive programmes for prevention, control or abatement of air pollution should be prepared and submitted to the State Government.*
- *RSPCB should coordinate with other departments like Industries, Factory and Boilers, etc. to obtain data of newly established industrial units to bring them under consent mechanism.*
- *RSPCB should enhance coverage for Ambient Air Quality Monitoring Systems in the towns and villages located near the major polluting industries.*
- *RSPCB should ensure that the samplers are installed at approved locations and the site should be suitable as per guidelines of National Ambient Air Monitoring Programme so that representative data is generated.*
- *The State Government and RSPCB should strengthen the AAQMS by providing all necessary instruments and facilities so that type and number of vehicles, meteorological data with respect to temperature, relative humidity, wind speed and direction could be recorded.*
- *RSPCB should ensure that no industrial unit operates without obtaining consent to establish and it should evolve a mechanism to watch the validity period of consent issued. The consent to operate must be issued in time and not retrospectively so that compliance with environmental conditions can be enforced.*
- *The Transport Department should conduct studies/surveys to assess pollution load in major cities so that measures for control and abatement of vehicular pollution could be planned. The Transport Department should make a strategic plan to phase out 15-year-old vehicles in a time bound manner. It should take measures like offering subsidies/direct cost benefits for fleet modernisation as envisaged under Environment Policy. Inspections of PUC centres must be carried out for strengthening the functioning of these centres*
- *The RSPCB should fill up all vacant technical and scientific posts so that it is fully equipped to exercise its mandate effectively.*
- *The RSPCB should ensure that the meetings of the Board are held in time and as per required norms. The prescribed monitoring mechanism should be strictly enforced.*