R-1

REVISED ACTION PLAN FOR CONTROL OF AIR POLLUTION IN NON-ATTAINMENT CITIES OF MAHARASHTRA

BADLAPUR

MAHARASHTRA POLLUTION CONTROL BOARD

KALPATARU POINT, 3rd Floor,
Sion-Matunga Scheme Rd. No.8,
Opp. Sion Circle, Sion (East),
Mumbai-400 022.

Date: 24th April, 2019

1. Introduction :

Badlapur is a growing city in Thane district, Maharashtra state, India. It is a part of the Mumbai Metropolitan Region. Due to population growth in nearby cities, people working in Mumbai have been moving to Badlapur for a number of socioeconomic reasons, including close proximity to Mumbai via rail. Badlapur was recognised as a town in 1971, as a municipal town in Ulhasnagar tehsil.The city has seen massive growth since the 1980s, with a rapid increase in population, due in part its proximity to Mumbai by rail, in consequence of which the area around the Badlapur railway station has developed faster than old Badlapur village itself. Badlapur has an average elevation of 44 metres (144 ft). The region surrounding Badlapur is mountainous. The Ulhas River flows between Badlapur and Kulgaon. Floods frequently occur due to Badlapur's geographical location near this mountain runoff. Badlapur and Kulgaon are connected by two bridges over the river. The city is virtually divided into two areas, "East" and "West", by the railway.

Figure 1: Satellite image of city of Badlapur in Thane district in Maharashtra

Kulgaon- Badlapur Municipal Council (KBMC) looks after the administrative affairs and is a Class-A Municipal council. Badlapur Municipal Council, with population of about one lakh seventy four thousand two hundred twenty six (as per 2011 Census) it is the least populous municipal council located in Ambernath sub district of Thane district in the state of Maharashtra in India. Total geographical area of Badlapur Municipal Council is approx. 36 sq. km.

2. CLIMATE:

The climate is tropical in Kulgaon-Badlapur. Dry season (Mar- May) followed by rainy (June- Sep) and then a brief winter (Nov-Feb). Maximum temperature is reached in April 38oC. Minimum temperature is reached during Jan. The average annual temperature in Kulgaon-Badlapur is 27.1℃. T he rainfall here averages 3115 mm.

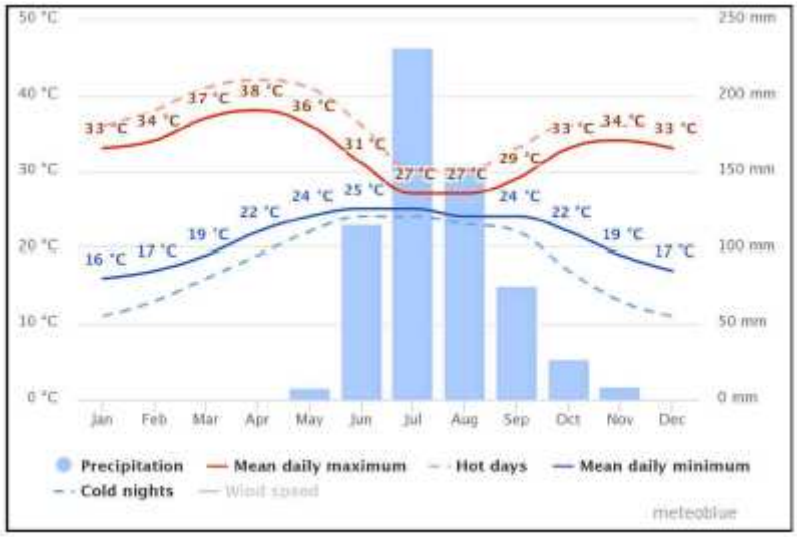

Figure 2: Variation in Temperature & Precipitation in Badlapur

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Kulgaon-Badlapur. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of

each month of the last 30 years. Monthly precipitations above 150 mm are mostly wet, below 30 mm mostly dry.

3. Demographic

Kulgaon-Badlapur municipal council is under Thane in Maharashtra State, Total wards are 47.

Total population in the study region (Census 2011) is worked out as 174226 out of which 90365 are male and 83861 female. Out of the total population, Scheduled Caste is 25496 (16.63%) and Scheduled Tribe is 6853 (3.93%) population in the study area according to 2011 census Thane district The literacy rate of the total population is worked out to 143480 (82.35%). Male literacy 76518 (53.33%), and female literacy is 66962 (46.67%).

4. **INDUSTRY :** status of industries in Badlapur is shown in table no.1

Table 1: Types of Industries in Badlapur

Type of Industry	Number of Units	Employment
Cotton textile	32	9600
Ready-made garment & embroidery	1	300
Chemical/Chemical based	118	11800
Rubber, Plastic & petro based	10	500
Metal based (Steel Fab.)	3	300
Engineering units	15	750
Electrical machinery and transport equipment	1	100
Repairing & servicing	22	1100
Others	3	300
Total	**205**	**24750**

5. Waste Management

Currently, the total waste generated in the city is estimated to be around 68 TPD. The major proportion of waste almost 80% is contributed by residential areas, followed by 12.5% by commercial establishments, 4.4% by fruit and vegetable markets remaining 2% is contributed by hotels, restaurants, institutional areas and hospitals.

6. TRANSPORTATION

a) **Rail:** Located about 68 kilometres (42 mi) from Mumbai, Badlapur is a terminal station for many trains, local to Mumbai, of the Central Railway zone, one of the two national zonal divisions of the Mumbai Suburban Railway operated by Indian Railways. By fast train it takes about 1.23 hours from Mumbai (CST) to Badlapur; by slow train it takes about 1.50 hours.

b) **Road:** The town is well connected to the Mumbai Pune Expressway. There are upcoming development which connect to Badlapur and Panvel which will take only 20 min to Reach Navi Mumbai from Badlapur. NMMT buses are available from Badlapur to Vashi and CBD Belapur/Turbhe Bus Station.

7. AMBIENT AIR QUALITY OF BADLAPUR:

Ambient air quality monitoring carried out at Badlapur at one location. The data for monthly average reading recorded at Badlapur-BIWA House for 2017-2018 is at table 2 and annual average trend of SO2, NOx and RSPM at table no.3.

Table No.2: Data for Monthly average reading recorded at Badlapur - BIWA House

Station Name	year	Month	Average of SO_2	Average of NOx	Average of RSPM
			50	***40***	***60***
	2017	Apr	18	57	107

Badlapur - BIWA House		May	34	107	190
		Jun	29	62	120
		Jul	25	74	136
		Aug	29	70	307
		Sep	19	56	111
		Oct	70	65	207
		Nov	29	70	328
		Dec	70	65	207
	2018	Jan	24	80	412
		Feb	24	80	412
		Mar	20	75	190

Table no.3: Data for Annual average trend of SO_2, NOx, and RSPM at Badlapur - BIWA House

Station Name	year	Average of SO_2	Average of NOx	Average of RSPM
		50	***40***	***60***
Badlapur - BIWA House	06-07	27	39	141
	07-08	30	42	93
	08-09	35	76	98
	09-10	55	85	103
	10-11	36	74	118
	11-12	41	68	121
	12-13	41	69	100
	13-14	35	49	96
	14-15	29	51	101
	15-16	23	61	113
	16-17	25	68	120
	17-18	31	73	239

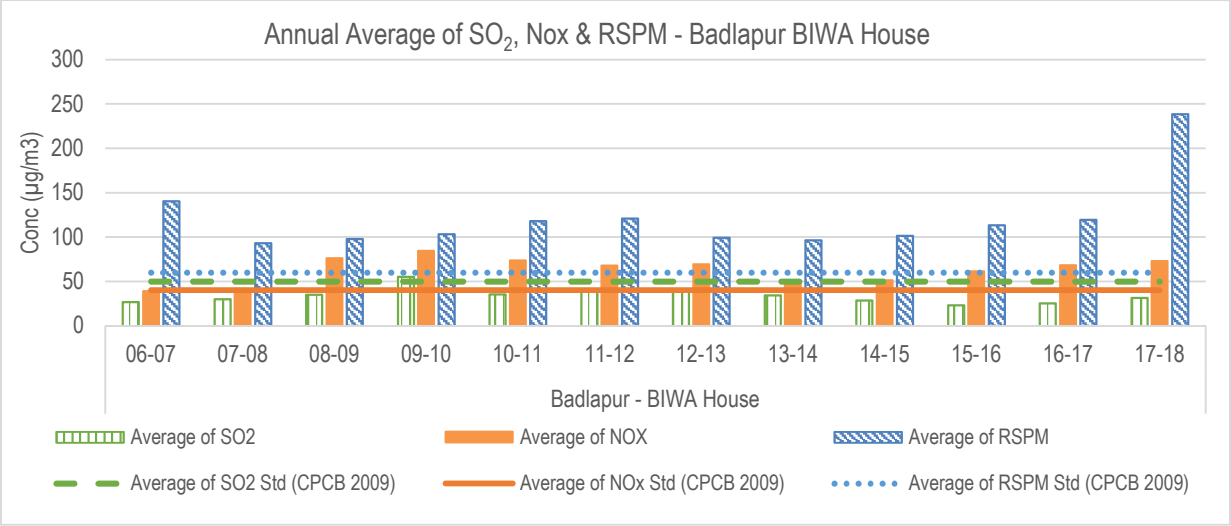

Figure no.3: Annual average trend of SO_2, NOx, and RSPM at Badlapur - BIWA House

8. Action Plan for Control of Air Pollution in Badlapur City:

The comprehensive action plan for control of air pollution of Badlapur city prepare by Kulgaon-Badlapur Municipal Council with all concern stakeholder is shown at table no.4

Action Plan for Control of Air Pollution of Badlapur City

Table No 4: Action Plan for Air Pollution Control at Badlapur City

Sl. No		Source group	Control option	Expected reduction and impacts	Technical feasibility	Requirement of financial resources	Implementation period (short/mid/long-term)	Time target for implementation	Responsible agency(ies)	Any other information
			Monitoring Mechanism							Badlapur Municipal Council has an Environment Cell (details attached) the cell will meet once in 2 months and examine the implementation. Commissioner- Head MPCB RO- Meeting Convener
1	(i)	Vehicle emission	Launch extensive drives against polluting vehicles for ensuring strict compliance	Moderate	Feasible	15 lakhs	Short (Regular on monthly basis & Extensive during winter months)	Start June 2019 - Dec 2021	KBMC, RTO, Traffic Police, Media	With involvement of Colleges & Local NGOs.

	(ii)		Launch public awareness campaigns for air pollution control, vehicle maintenance, minimising use of personal vehicles, lane discipline etc.	Moderate	Feasible	15 lakhs	Short (regular & Extensive campaigns during winter months particularly pre & post Diwali)	Start June 2019 - Dec 2021	Traffic Police, NGO, RTO, KBMC, Media, College	With involvement of Colleges & local NGOs. Buses and display Board at traffic intersection to be used for advertisement.
	(iii)		Prevent parking of Vehicles at Non designated areas	Moderate (city congested area)	Feasible	Not Needed (balance with fine from impounded vehicles)	Short (regular monthly checks with fine)	Start June 2019 - Dec 2021	KBMC, Traffic Police	

	(iv)		Initiate steps for retrofitting of particulate filters in Diesel vehicles, when BS-V fuels are available	Moderate (will reduce the overall Air Pollution Load)	Should be technically checked for efficiency	Rs 0.5-0.7 lakhs per unit https://dir.indiamart.com/impcat/diesel-particulate-filters.html	Long term	Start June 2019- Dec 2022	GoI, GoM, RTO	Policy decision
	(v)		Prepare action plan to check fuel adulteration and random monitoring of fuel quality data	Moderate	Feasible	Survey and random checking work -Rs 5-10 lakhs	Mid-term but a continuous process	Start June 2019	Residence Deputy Collector (RDC), anti-adulteration cell, RTO	Checking fuel adulteration with coordination of anti-adulteration cell which is a continuous process.

	(vi)		Prepare action plan for widening of road and improvement of Infrastructure for decongestion of Roads.	High	Feasible	--	Mid (in progress) as per city Development plan	2019-2022	MMRDA, PWD, KBMC	. Katai Naka Badlapur State Highway-widened to a six lane highway . 100 feet bypass road Neral Badlapur Highway. Easy Connectivity between Kalyan And Karjat. NMMT bus services active on this route. .ShailPhata Karjat Road passes through Badlapur connecting to Navi Mumbai. .Vangni Karjat State Highway 21.1 Kms State Highway .Kalyan Badlapur Vangni State Highway 27.80 Kms Long Highway .Virar Alibaug Road (Multimodal Corridor) part of the 126 Kms long Virar Alibaug Multi Modal corridor, is a proposed 20 Kms road between Dombivali and

										Badlapur that will bypass Kalyan. .Vasai Virar to panvel bypass via Badlapur .Other highways being upgraded to 4lanes to and from karjat to Khopoli or Pune.
	(vii)		Prepare Plan for the construction of expressways/bypass to avoid congestion	Moderate	Feasible	--	Planned		MMRDA, PWD	100 feets bypass road, Vasai Virar to Panvel Bypass via Badlapur
	(viii)		Steps for Promoting Battery operated vehicles	Moderate	Feasible	Yes, 2 Crores for infrastructure and	Mid-Long Term	June 2019- Dec 2021	KBMC, Traffic	Charging point and training center for E Rickshaws

						charging station for battery operated vehicles				
	(x)		Synchronize Traffic movements/Introduce Intelligent Traffic systems for Lane Driving	Moderate	Feasible	yes, 1 Crs.	Mid-Long term	2019-2021	MMRDA, PWD	-
	(xi)		Installation of Remote Sensor based PUC systems	Moderate	Not feasible till next few years	--	Long term	2022 onwards	Traffic, RTO	-
	SCS-1		Sulphur reduction in diesel	-	Feasibility to be checked	-	-	-	Oil & gas Companies	Policy decision
	SCS-2		Introduction of new technology vehicles	-	Feasibility to be checked	-	-	-	MORTH/ARAI	Policy decision
	SCS-3		Provide good public	High	Feasible	Yes, 5 Cror	Short-Mid	Jan 2020-Dec 2022	KBMC,NMMT, MSRTC	-

			transport system			es for CNG buses on Pilot basis				
	SCS-4		Standards for new and In-use vehicles	Moderate	Feasible	-	Long term	2022 onwards	ARAI/RTO	Policy decision
	SCS-5		Alternative fuels	High	Feasible	-	Long term	2022 onwards	Oil Companies	Policy decision
	SCS-6		Implementation of BS – VI norms	High	Feasible	-	Long term	2022 onwards	RTO	Policy decision
	SCS-7		Electric / Hybrid Vehicles	High	Feasible	-	Mid	June 2019-Dec 2021	KBMS/Automobile Firms	Discussed under E-Rickshaws
	SCS-8		OE-CNG for new public transport buses	High	Feasible	Already have CNG Station	Mid	2019-2020	KBMC, Oil & Gas Companies	-
	SCS-9		Ethanol blending (E10 – 10% blend)	High	Feasible	-	Long	continuous process	Min O & NG, Fuel firm	-
	SCS-10		Bio-diesel (B5/B10: 5 – 10% blend)	High	Feasible	-	Mid	continuous process	Min O & NG, Fuel firm	-

	SCS-11		Retro-fitment of Diesel Oxidation Catalyst (DOC) in 4-wheeler public transport (BS–II and BS-III)	High	Feasibility to be checked	-	Long	2020	RTO	Policy decision
	SCS-12		Retro-fitment of Diesel Particulate Filter in 4-wheeler public transport(BS – III city buses)	High	Feasibility to be checked	-	Long	2020	RTO/ Traspoert Department	Policy decision
	SCS-13		Banning of 10 year old commercial vehicles	High	Feasibility to be checked	-	Long	2020	RTO	Policy decision
	SCS-14		Inspection/ maintenance to all BSII & BSIII commercial vehicles	High	Feasibility to be checked	-	Long	2020	RTO	Policy decision
	SCS-15		Restrict commercial vehicles entering city	Moderate	Feasible	Yes, under city deve	Mid-Long	2020 - continuous process	KBMC, MMRDA	-

			by having ring roads			lopment plan				
2	I	Resuspension	Prepare plan for creation of green buffers along the Traffic corridors	High	Feasible	Yes Rs.3.2 Cr (Amrut Green Spaces)	Short	2019-2020	KBMC, Horticulture, NGO	Amrut Green Space Project for 2015-16,2016-17, 2017-18 completed. Planatation under "July Vanmohastav" is in progress.
	II		Maintain Pothole Free Roads for Free Flow Traffic	High	Feasible	Yes, Rs. 90 Lakhs approx. per year	Regular	Continuous Process	KBMC	-
	III		Introduce water fountains at Major Traffic intersection, wherever feasible	Moderate	Feasible	Yes 10 Lakhs	Short (in progress identifying 5 spots cost of Rs 2Lakh per site total 10 Lakhs)	Nov 2019 - May 2020	KBMC	Installation of VAYU instruments

	IV		Greening of open areas, garden, community places, schools and housing societies	Moderate	Feasible	Yes (Rs. 5.75 crs. For 2019-20)	Regular	Continuous Process	KBMC Horticulture, NGOs	-
	V		Blacktopping of metaled Roads including pavement of Road shoulders	Moderate	Feasible	Yes	Long	2019 - Continuous Process	MMRDA, PWD, KBMC	
	SCS-1		Wall to wall paving (brick)	Moderate	Feasible	Yes	Long	2019 - Continuous Process	MMRDA, PWD, KBMC	
	SCS-2		Road design improvement	Moderate	Feasible	Yes	Long	2019 - Continuous Process	MMRDA, PWD, KBMC	

3	(i)	Biomass/trash burning, landfill waste burning	Launch extensive drive against open burning of biomas,s crop residue, garbage, leaves etc.	High	Feasible	Yes Rs 10 Cr (for development of SWM project)	Short	Regular basis Start 2018	KBMC, NGOs, College	SWM DPR of cost Rs.10.0 Crs approved under SBM for solid waste management. So as to prevent the open dumping and burning of SWM. 42 compartmented ghanta gadis purchased. SWM project physical work is in progress at allotted landfill site, 5 km from city. 68 T of waste are generated each day. 2 OWC units (capacity 3 T/d) and 1 biogas plant (capacity 5 t/d), decentralized waste treatment units are functional. Massive awareness Campaign by KBMC for waste segregation & composting in 22 residential societies.
	(ii)		Regular check and control, of burning of	High	Feasible	Yes 10 lakhs	in progress	2019 - 2020	KBMC	-

			Municipal Solid waste							
	(iii)		Proper collection of Horticulture waste and its disposal following composting –cum – gardening approach	High	Feasible	Yes 10 lakhs	in progress	2019 - 2020	KBMC	Composting using twin trumlers in 11 KBMC gardens is in process.
	(iv)		Ensure ban on burning of agricultural waste and crop residues and its implementation	Moderate	Feasible	Yes 1 lakhs	in progress	2019 - Continuous Process	KBMC	Most of KBMC area is urbanised
	SC S-1		Strict compliance of ban on open burning	Moderate	Feasible	Yes 10 lakhs	in progress	2019 - Continuous Process	KBMC	As per MSW Rules 2016 implementation is in progress
4	(i)	Industry	Identification of Brick Klin and their regular monitoring	High	feasible	Not required	in progress	by 2020	District Administration/MPCB	-

			including use of designated fuel and closure of unauthorized units							
	(ii)		Conversion of natural draft brick kilns to induced draft	High	feasible	Not required	in progress	by 2020	District Administration/MPCB	-
	(iii)		Action against non-complying industrial units	High	feasible	Not required	in process	Continuous Process	MPCB	Between Jan, 2018- Mar, 2019 Show cause notices- 16, Proposed directives- 13, Interim directives- 5
	SCS-1		Sulphur reduction in fuel	High	feasible	Not required	in process	Continuous Process	Oil Companies	
	SCS-2		Improved Combustion technology	High	feasible	Not required	in process	Continuous Process	ARAI	
	SCS-3		Alternate fuel	moderate	feasible	Not required	in process	by 2020	Oil Companies	Textile and Chemical industries in Badlapur, Old Ambernath and Add Ambernath MIDC using coal/ wood should convert to Natural Gas.

	SCS-4		Promoting cleaner industries	High	feasible	Not required	in progress	2020	Industry Dept./MPCB	2 Industries Fine organics and Ambernath Organics changed to cleaner fuel PNG in Badlapur 15 industries in Add. Ambernath MIDC will also switch to cleaner fuel
	SCS-5		Location specific Emission reduction	High	feasible	Not required	in process	Continuous Process	MPCB	6 stone crushing units and quarries in Periphery of Badlapur in operation
	SCS-6		Fugitive emission control	High	feasible	Not required	in process	Continuous Process	Industry	-
	SCS-7		Banning of new industries in existing city limit	High	Not feasible	-	-	-	MPCB	-
	SCS-8		Installation/ upgradation of air pollution control systems	High	feasible	Not required	in progress	Continuous Process	Industry/MPCB	-
	SCS-9		Use of high grade coal	High	feasible	Not required	in progress	Continuous Process	Industry/MPCB	-

	SCS-10		Regular audit of stack emissions for QA/QC	High	feasible	Not required	in progress	Continuous Process	MPCB	-
			Set up and publicize helpline in each city/towns as well as SPCB/PCC HQ for complaints against reported non-compliance				KBMC has a fullfledged grievance redressal app in place for receiving and addressing the public grievances. It has also a toll free number 18002709696 for registering grievances. The Citizens can also register their grievances on KBMC website www.kbmc.gov.in KBMC has given wide publicity to all the above redressal mechanisms for the public at large.	Completed	KBMC/MPCB	

5	(i)	Construction and Demolition Activities	Enforcement of construction & demolition rules	Moderate	feasible	Not required (as council is levying user charges to individuals)	in progress	Continuous Process	KBMC/Revenue	KBMC is appointing separate agency for construction and transportation of C & D waste and will act as facitity.
	(ii)		Control measures for fugitive emissions from material handling, conveying and screening operations through water sprinkling, curtains, barriers and suppression units	High	feasible	Not required	short	2019	KBMC	KBMC will incorporate the terms and conditions in Building permission

	SCS-1		Better construction practices with PM reduction of 50%	Moderate	feasible	Not required	Mid	2019	KBMC	KBMC will incorporate the terms and conditions in Building permission
	SCS-2		Banning of operation of brick kilns in city area	-	-	-	-	2020	KBMC	Brick Klins are not operational in municipal limit
	SCS-3		Ensure carriage of construction material in closed /covered Vessels	Moderate	feasible	Not required	Short	2019	KBMC	KBMC will incorporate the terms and conditions in Building permission
			Establishment of a continuous Air Quality Monitoring station within the city with display Board	High	feasible	Yes 2 Crors	Mid	Dec 2019-June 2020	MPCB	MPCB is planing to install 1 CAAQMS Station in Badlapur in addtion to 3 manual monitoting station
10		Other (city specific)								

9. Air Quality Monitoring Network:

Presently one NAMP station is in operation in Badlapur Municipal Council area. M.P.C.Board is planning to install 1 CAAQMS Station and 3 manual monitoring station. Time target for implementation is 2 years and financial requirement is Rs.2.0 Crs.

10. Source Apportionment (SA) and Emission Inventory (EI):

It is proposed to assign the work of source apportionment and emission inventory of Badlapur city to NEERI and IIT, Mumbai.

11. Monitoring Mechanism for Implementation

State of Maharashtra has constituted State Level Air Quality Management Committee under chairmanship of Principle Secretary, Environment Department. Same committee supervised by Chief Secretary, GoM. The aforesaid action plan shall be implemented by State with coordination of concern departments/stake holders

12. **Implementation status**

The Chief Secretary, Govt. of Maharashtra to convene the meetings with different concerned departments and direct for compliance of directions for implementation of air quality of Badlapur. The Principal Secretary, Environment, Govt. of Maharashtra to also convene the meeting for follow up of the aforesaid directions. The Maharashtra Pollution control Board continuously conducted the meetings with all stakeholders for preparation of comprehensive action plan for city and its implementation.

Compliance of CPCB Recommendation as per letter dtd.16/04/2019

Annexure -I

State:- Maharashtra

City: - Badlapur

Sr. No.	Key Component	Observations	Remarks	Submission and Reply
1	Air Quality Monitoring Network	The Plan is not properly prepared and does not give sufficient details of the key components	Plan Needs to be redone and submitted as per the format addressing key components	Revised action plan is prepared as per CPCB template along with source identification, action Point, strategy for implementation along with time frame, executing agency and budgetary support. Presently one NAMP station is in operation at Badlapur. MPCB is planning to install 1 CAAQMS Station and 3 manual monitoring station. Target for implementation is 2 years and financial requirement is Rs.2.0 Crs. It is proposed to assign the work of source apportionment and emission inventory of Badlapur city to NEERI and IIT, Mumbai.
2	Source Identification			
3	Source Apportionment (SA) and Emission Inventory (EI)			
4	Action Points			
5	Long term Strategy			
6	Time frame			
7	Executing Agencies			
8	Public awareness and complaint Redressal Mechanism			
9	Budget Support			