DEPARTMENT OF HOUSING & ENVIRONMENT
GOVERNMENT OF CHHATTISGARH
MANTRALAYA, MAHANADI BHAWAN
ATAL NAGAR, DISTRICT - RAIPUR

Action Plan for Restoration of Environmental Qualities of Industrial Clusters Urla, Siltara, Korba and Bhilai of Chhattisgarh

Index

Item No. 05 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 1038/2018

News item published in "The Asian Age" Authored by Sanjay Kaw Titled
"CPCB to rank industrial units on pollution levels"

Date of hearing: 13.12.2018

CORAM: **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

ORDER

1. The matter has been taken up on the basis of news item titled "CPCB to rank industrial units on pollution levels" authored by Mr. Sanjay Kaw published in the Asian Age dated 06.12.2018. Out of 88 identified industrial clusters, 43 industrial clusters in 16 States having Comprehensive Environmental Pollution Index (CEPI) score of 70 and above were identified as Critically Polluted Areas (CPAs). Further, 32 industrial clusters with CEPI scores between 60 and 70 were categorized as Seriously Polluted Areas (SPAs), and this was based on evaluation of CEPI carried out in the year 2009-10. In a later evaluation, the number of identified polluted industrial clusters went up to 100 in the year 2017-18.

2. CEPI is based on evaluation of environmental parameters including ambient air, surface water and health related statistics. Based on such study, directions have been issued by the Central Pollution Control Board (CPCB) under Section 18(1) (b) of the Water (Prevention and Control of Pollution) Act, 1974 for installation of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) and

Real Time Water Quality Monitoring Stations (RTWQMS) at various locations.

3. Revised CEPI (2016) is comprised of the following components:

"

Component A	Scale of Industrial Activity	20 marks
Component B	Status of Ambient Env. Quality (Air/SW/GW)	50 Marks
Component C	Health related statistics	10 Marks
Component D	Compliance status of industries	20 Marks

"

4. As per direction of CPCB dated 26.04.2016, addressed to the State Pollution Control Boards (SPCBs), the SPCBs are required to take steps to ensure prevention, control and abatement of pollution in critically polluted industrial clusters by installing Environmental Quality Monitoring Systems for which purpose action plan in respect of monitoring mechanism are to be evolved, in the manner stated in the said order. Forty Three (43) Critically Polluted Areas and 32 Severely Polluted Areas were identified based on CEPI criteria in the Year 2009 are as follows:

S.No.	***Name of States***	***Clusters with CEPI >70 (43 Critically polluted Areas)***	***Clusters with CEPI 60-70 (32 Severely polluted areas)***
1.	*Andhra Pradesh*	*Vishakhapatnam (70.82)*	*Vijayawada (60.57)*
2.	*Bihar*	--	*West Singhbhum (67.30)*
3.	*Chhattisgarh*	*Korba (83.00)*	*Raipur (65.45)*
4.	*Delhi*	*Najafgarh-Drain Basin (79.54) including Anand Parbat, Naraina, Okhla, Wazirpur*	--
5.	*Gujarat*	*Ankleshwar (88.50), Vapi (88.09), Ahmedabad (75.28), Vatva (74.77),*	*Vadodara (66.91), Rajkot (66.76)*

		Bhavnagar (70.99), Junagarh (70.82)	
6.	Haryana	Faridabad (77.07), Panipat (71.99)	--
7.	Himachal Pradesh	--	Baddi (69.07), Kala Amb (68.77), Parwanoo (63.83)
8.	Jharkhand	Dhanbad (78.63)	Jamshedpur (66.06), Saraikela (65.38), Ramgarh (65.11), Bada jamtara (64.47)
9.	Karnataka	Mangalore (73.68), Bhadravati (72.33)	Raichur (68.07), Bidar (67.64), Pinia (65.11)
10.	Kerala	Greater Kochin (75.08)	--
11.	Madhya Pradesh	Indore (71.26)	Dewas (68.77), Nagda-ratlam (66.67), Pitampur (65.09)
12.	Maharashtra	Chandrapur (83.88), Dombivalli (78.41), Aurangabad (77.44), Navi Mumbai (73.77), Tarapur (72.01)	Nashik (69.25), Chembur (69.19), Pimpari – Chinchwad (66.06)
13.	Orissa	Angul Talchar (82.09), IB-Valley (74.00) Jharsugula (73.34)	Pardeep (69.26)
14.	Punjab	Ludhiana (81.66), Mandi Govindgarh (75.08)	Batala (68.59), Jalandhar (64.98)
15.	Rajasthan	Bhiwadi (82.91), Jodhpur (75.19), Pali (73.73)	Jaipur (66.82)
16.	Tamil Nadu	Vellore-North Arcot (81.79), Cuddalore (77.45), Manali (76.32), Coimbatore(72.38)	Tirupur(68.38), Mettur (66.98)
17.	Telangana	Patancheru-Bollaram (70.07)	--
18.	Uttar Pradesh	Ghaziabad (87.37), Singrauli (81.73), Noida (78.90), Kanpur (78.09), Agra (76.48), Varanasi-Mirjapur (73.79)	Moradabad (64.71), Aligarh (63.83), Ferozabad (60.51)
19.	Uttarakhand	--	Haridwar (61.01)

20.	West Bengal	Haldia (75.43), Howrah (74.84), Asansole (70.20)	Durgapur (68.26)

"

5. Purpose of economic development in any region is to provide opportunities for improved living by removing poverty and unemployment. While industrial development invariably creates more jobs in any region, such development has to be sustainable and compliant with the norms of environment. In absence of this awakening or tendency for monitoring, industrialization has led to environmental degradation on account of industrial pollution. It is imperative to ensure that steps are taken to check such pollution to uphold statutory norms. Adequate and effective pollution control methods are necessary.

6. Dust, smoke, fume and toxic gas emissions occur as a result of highly polluting industries such as thermal power plants, coal mines, cement, sponge iron, steel and ferrow alloys, petroleum and chemicals unless right technology is used and precaution taken. Industry specific clusters have not only become hazardous but also cause irreparable damage to our ecology and environment, often breaching the environment's carrying capacity, adversely affecting public health.

7. In *Karnataka Industrial Areas Development Board vs. C. Kenchappa & Ors*[1], the Hon'ble Supreme Court observed, as guiding rules for Sustainable Development, that humanity must take no more from nature than man can replenish and that people must adopt lifestyles and development paths that work within the nature's limit. In *Vellore Citizens Welfare Forum Vs. Union of India*[2], the Hon'ble Supreme Court recognized the Precautionary Principle and explained that environmental measures by the State Government and the

[1] (2006) 6 SSC 383
[2] AIR 1996 SC 2715

statutory authorities must anticipate, prevent and attack the causes of environmental degradation.

8. This Tribunal has applied the same principles in deciding matters[3] before it in terms of Section 20 of the National Green Tribunal Act 2010.

9. In view of above, we direct the SPCBs/ Committees to finalize the time bound action plans with regard to identified polluted industrial clusters in accordance with the revised norms laid down by the CPCB to restore environmental qualities within norms. Such action plan be finalized within three months from the date of receipt of copy of this order. In case of any left- out/missed areas in addition to 100 areas also, SPCBs should undertake CEPI assessment and formulate action plans.

10. The action plan may thereafter be looked into by the CPCB and steps taken for implementation so as to ensure that all the industrial clusters comply with laid down parameters as per the Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981. The CPCB will be the Nodal agency. Meanwhile, CPCB will forward Assessment Report for 100 areas carried out during 2017-2018 to MoEF & CC before 28.02.2019 for appropriate action.

11. Needless to say that it will be open to the SPCBs/Committees and CPCB to take coercive measures including recovery of compensation for the damage to the environment on 'Polluter Pays' principle as well as also to direct taking of such precautionary

[3] Aditya N. Prasad & Ors. Vs. Union of India & Ors., Original Application No. 147/2016, Order dated 01.11.2018; We the People, Th. Gen. Secretary Vs Union of India & Ors. Original Application No. 214/2017, Order dated 01.11.2018; Westend Green Farms Society Vs. Union of India & Ors., Original Application No. 400 of 2017, Order dated 02.11.2018; Saloni Ailawadi Vs Union of India & Ors, Original Application No. 509/2015, Order dated 16.11.2018; Shantanu Sharma Vs Union of India & Ors, Original Application No. 117/2014, Order dated 20.11.2018; Dr. Arun Kumar Sharma Vs. Ministry of Environment, Forest and Climate Change & Anr., Original Application No. 312 of 2016, Order dated 26.11.2018.

measures as may be necessary on the basis of 'Precautionary principle'.

12. CPCB may serve copy of this order on all the SPCBs and the Committees who may furnish the same to the concerned Chief Secretaries. Ministry of Environment, Forest and Climate Change (MoEF&CC) may take necessary steps on its part based on CPCB Report for 100 areas mentioned above in accordance with law. The Report on the action taken by the CPCB and MoEF&CC in the matter may be furnished to this Tribunal by e-mail at ngt.filing@gmail.com before 31.05.2019. Copies of this order be sent by e-mail to CPCB and MoEF&CC for compliance.

13. The action plan to be prepared in the States may be done by the Committee constituted by the Chief Secretary within one month from today as several Departments may be involved in the exercise. The final preparation of the action plan including its execution may be overseen by the Chief Secretary of the concerned State, along with the other connected major environmental issues of the States, such as pollution of river stretches, non-attainment cities in terms of air quality and solid waste management, utilization of treated sewage, covered by order of this Tribunal dated 20.09.2018 in Original Application No. 673/2018, News Item Published in 'The Hindu' authored by Shri. Jacob Koshy titled "More river stretches are now critically polluted: CPCB", order dated 08.10.2018 in Original Application No. 681/2018, News Item Published In 'The Times of India' Authored by Shri. Vishwa Mohan Titled "NCAP with Multiple Timelines to Clear Air in 102 Cities to be released around August 15", order dated 20.08.2018 in Original Application No. 606/2018, Compliance of Municipal Solid Waste Management Rules, 2016 and order dated 27.11.2018 in Original Application No. 148/2016, Mahesh Chandra Saxena Vs. South Delhi Municipal Corporation &

Ors. The Chief Secretary will take meetings on all these issues once in three months (quarterly) and will forward Report to NGT by e-mail.

14. List for consideration of report of MoEF&CC and the CPCB on 08.07.2019.

Adarsh Kumar Goel, CP

K. Ramakrishnan, JM

Dr. Nagin Nanda, EM

December 13, 2018
Original Application No. 1038/2018
AG

छत्तीसगढ़ शासन
आवास एवं पर्यावरण विभाग
:: मंत्रालय ::
महानदी भवन, अटल नगर, जिला रायपुर
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//आदेश//

अटल नगर, दिनांक २५/01/2019

क्रमांक एफ 4–4/2018/32 :: माननीय राष्ट्रीय हरित अधिकरण, प्रमुख पीठ, नई दिल्ली द्वारा ओ.ए. कमांक 1038/2018 में दिनांक 13.12.2018 को पारित आदेश के पालन में प्रदेश स्थित Critically Polluted Area, कोरबा एवं Severely Polluted Area रायपुर के Industrial Cluster में पर्यावरणीय स्थिति में सुधार हेतु चरणबद्ध कार्य योजना तैयार करने हेतु राज्य शासन निम्नानुसार छः सदस्यीय समिति का गठन करता है:–

1. विशेष सचिव (स्वतंत्र प्रभार), छत्तीसगढ़ शासन, आवास एवं पर्यावरण विभाग
2. आयुक्त/अतिरिक्त परिवहन आयुक्त
3. संचालक, उद्योग, उद्योग संचालनालय
4. संचालक, नगरीय प्रशासन एवं विकास
5. संचालक, कृषि, कृषि संचालनालय
6. सदस्य सचिव, छत्तीसगढ़ पर्यावरण संरक्षण मण्डल

2/ उक्त समिति द्वारा तैयार की गई चरणबद्ध कार्य योजना के कियान्वयन की तिमाही समीक्षा मुख्य सचिव, छत्तीसगढ़ शासन द्वारा की जाएगी।

3/ उपरोक्तानुसार समिति के गठन हेतु सामान्य प्रशासन विभाग ने यू.ओ. कमांक 09, दिनांक 21.01.2019 द्वारा सहमति दी है।

छत्तीसगढ़ के राज्यपाल के नाम से
तथा आदेशानुसार,

(जी.एल. सांकला)
उप सचिव

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25/1/19
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30/1/19

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पृ.क्रमांक एफ 4–4/2018/32 अटल नगर, दिनांक २५/01/2019

प्रतिलिपिः–

1. विशेष सचिव (स्वतंत्र प्रभार) छत्तीसगढ़ शासन, आवास एवं पर्यावरण विभाग
2. आयुक्त/अतिरिक्त परिवहन आयुक्त, इन्द्रावती भवन, अटल नगर
3. संचालक, उद्योग, उद्योग संचालनालय, रायपुर
4. संचालक, नगरीय प्रशासन एवं विकास, इन्द्रावती भवन, अटल नगर,
5. संचालक, कृषि, कृषि संचालनालय, रायपुर,
6. सदस्य सचिव, छत्तीसगढ़ पर्यावरण संरक्षण मण्डल, पर्यावास भवन,
7. उप सचिव, मुख्य सचिव कार्यालय, मंत्रालय, महानदी भवन,

की ओर माननीय राष्ट्रीय हरित अधिकरण, प्रमुख पीठ, नई दिल्ली द्वारा ओ.ए. कमांक 1038/2018 में पारित आदेश दिनांक 13.12.2018 की छायाप्रति सहित सूचना एवं आवश्यक कार्यवाही हेतु अग्रेषित।

उप सचिव
छत्तीसगढ़ शासन
आवास एवं पर्यावरण विभाग

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राज्य मेंस्थितIndustrial Clusters Urla, Siltara, Korba and Bhilaiमेंपर्यावरणीय स्थितिमेंसुधार(Restoration of Environmental Qualities within Norms)हेतुकार्ययोजनातैयारकरने के संबंध मेंबैठक

माननीय राष्ट्रीय हरित प्राधिकरण, प्रमुख पीठ, नईदिल्ली द्वारा ओ.ए. कमांक 1038/2018 में दिनांक 13/12/2018 को पारित आदेश के पालन में राज्य के Industrial Clusters Urla, Siltara, Korba and Bhilaiमें पर्यावरणीय स्थिति में सुधार (Restoration of Environmental Qualities within Norms) हेतु कार्य योजना तैयार करने के लिए गठित 06 सदस्यीय समिति की बैठक दिनांक 26/03/2019 को संपन्न हुई। उक्त बैठक मे निम्नलिखित अधिकारी/प्रतिनिधि उपस्थित हुए:–

1. विशेष सचिव, छत्तीसगढ़ शासन, आवास एवं पर्यावरणविभाग
2. आयुक्त/अतिरिक्त परिवहन आयुक्त
3. संचालक, उद्योग, उद्योग संचालनालय
4. संचालक, नगरीय प्रशासन एवं विकास विभाग
5. संचालक, कृषि, कृषि संचालनालय
6. सदस्य सचिव, छत्तीसगढ़ पर्यावरण संरक्षण मंडल

समिति द्वारा माननीय राष्ट्रीय हरित प्राधिकरण, प्रमुख पीठ, नईदिल्ली द्वारा पारित आदेश दिनांक 13/12/2018 का अवलोकन कर ड्राफ्ट एक्शन प्लान पर विचार विमर्श किया गया। विचार विमश उपरांत समिति द्वारा राज्य के Industrial Clusters Urla, Siltara, Korba and Bhilaiमे पर्यावरणीय स्थिति मे सुधार (Restoration of Environmental Qualities within Norms) हेतु संलग्न तैयार की गई कार्ययोजना का अनुमोदन किया गया।

(आर.पी. तिवारी) सदस्य सचिव, छत्तीसगढ़ पर्यावरणसंरक्षणमंडल	(बी.एल. ध्रुव) सहायक परिवहन आयुक्त	(आर.के. श्रीवास्तव) अपर संचालक, उद्योग, उद्योगसंचालनालय	(एस. ब्यौहार) मुख्य अभियंता, नगरीय प्रशासन एवंविकासविभाग	(सी.बी. लोन्ढेकर) संयुक्त संचालक, कृषि, कृषिसंचालनालय	(संगीता पी.) विशेषसचिव, छत्तीसगढ़ शासन, आवास एवंपर्यावरणविभाग

Action Plan for Restoration of Environmental Qualities within Norms in Polluted Industrial Clusters of Chhattisgarh State

Introduction

The Hon'ble NGT, Principal Bench, New Delhi in the matter of O.A. No. 1038/2018 in the matter of News item published in "The Asian Age" Authored by Sanjay Kaw titled "CPCB to rank industrial units on pollution levels" on dated 13/12/2018 order that "the SPCBs/Committees to finalize the time bound action plans with regard to identified polluted industrial clusters in accordance with the revised norms laid down by the CPCB to restore environmental qualities within norms. Such action plan be finalized within three months from the date of receipt of copy of this order. In case of any left-out/missed areas in addition to 100 areas also, SPCBs should undertake CEPI assessment and formulate action plans."

Hon'ble NGT, also directed that "the action plan to be prepared in the States may be done by the Committee constituted by the Chief Secretary within one month from today as several Departments may be involved in the exercise. The final preparation of the action plan including its execution may be overseen by the Chief Secretary of the concerned State, along with the other connected major environmental issues of the States, such as pollution of river stretches, non-attainment cities in terms of air quality and solid waste management, utilization of treated sewage....." The Chief Secretary will take meetings on all these issues once in three months (quarterly) and will forward Report to Hon'ble NGT by e-mail.

Constitution of Committee

In compliance to above direction an Inter-Departmental Committee has been constituted by Housing and Environment Department, Government of Chhattisgarh vide order no. F 4-4/2018/ 32, dated 24/01/2019 **(Annexure-I)** consisting of following members:-

1. Special Secretary (Independent Charge), Government of Chhattisgarh, Housing and Environment Department
2. Commissioner/Additional Transport Commissioner
3. Director Industry, Directorate of Industries
4. Director, Urban Administration and Development
5. Director Agriculture, Directorate of Agriculture

6. Member Secretary, Chhattisgarh Environment Conservation Board

Polluted Industrial Clusters

In the Chhattisgarh State, four polluted industrial clusters namely Urla, Siltara, Korba and Bhilai have been identified by CPCB. Urla and Siltara industrial clusters are in the Raipur Districts. Korba and Bhilai industrial clusters are in the Korba and Durg Districts respectively.

URLA INDUSTRIAL CLUSTER

Introduction

Raipur is the capital and the largest city of Chhattisgarh State. It was formerly a part of Madhya Pradesh before the State of Chhattisgarh was formed on 1st November, 2000. Raipur district is surrounded by Baloda-Bazar- Bhatapara district in North, Dhamtari and Gariyaband districts in South, Mahasamund district in East and Durg and Bemetara districts in West. Total area of Raipur district is 2,91,437000 ha. As per 2011 census, total population of the Raipur district is 21,60,876 having urban population of 12,76,652 and rural population of 8,84,224.

Forest cover in Raipur district is very less compared to other districts (Bilaspur, Dhamtari and Mahasamund) of central region. There are mostly open forests in Raipur district. Most of the forest cover is in eastern and southern part of the district. There are two wildlife sanctuaries in Raipur forest division – Barnawapara Wildlife and Udanti Wildlife Sanctuary. Total forest cover in Raipur and Dhamtari districts is 5459 sqkm. However, there are sparsely distributed trees with negligible forest cover within 25 km radius in Raipur. The details of forest cover within 25 km radius of Raipur are given in the following table:-

Area	Geographic (GA)	Forest Cover	% of GA
Within 25 km radius of Raipur	1964	-	-
Raipur & Dhamtari District	16468	5459	33.11
Chhattisgarh State	135191	55586	41.12

Raipur is the biggest agricultural produce market, industrial hub and eminent cultural platform of Chhattisgarh State. Raipur is the largest market of steel in India. Raipur houses one of the biggest iron markets in India.

As per 2011 census population of Raipur city is 10,48,112, which was 6,97,013 in the year 2001. This enhancement in the population is mainly because of formulation of new Chhattisgarh State in the year 2000. Raipur is well connected by roads, railways and air. It has become more prominent after the setup of Atal Nagar, the new capital city. The total area of Raipur city is 142 sqkm which further expands to 226 sqkm after addition of 7 adjoining villages to its boundaries.

The topography of the area is almost flat to gently sloping towards North. The area consists of sub-dendritic drainage pattern. Average rainfall of Raipur is 1300 mm.

Chhattisgarh State is bestowed with a vast variety of mineral resources including coal, bauxite, iron ore, tin, dolomite, limestone. Large portion of lime stone reserve of Chhattisgarh is buried in Raipur and Balodabazar-Bhatapara districts. The easy availability of limestone has led to the establishment of cement industries and stone crushers in these districts.

There are eight designated industrial areas in and around Raipur City namely Urla, Borjhara, Gogaon, Rawabhata, Bhanpuri, Amaseoni, Metal Park Near Urla and Siltara. There are number of sponge iron industries and rolling mills in Raipur due to availability of iron ore in Chhattisgarh State. Ore is also imported from Northern Orissa. Major industries in Chhattisgarh State are:-

S. No.	Name of Industries	Numbers
01	Integrated Steel Plant	03
02	Sponge Iron Plant	91
03	Thermal Power Plant (Coal Based)	32
04	Thermal Power Plant (Biomass)	25
05	Alluminium Plant	01

06	Cement	10
07	Fertilizer Plant	02
08	Pulp and Paper Plant	04
09	Sugar Industry	04
10	Distillery	03
11	Coal Washery	31
12	Mine (Limestone / Coal / Iron Ore / Bauxite etc.)	78
13	Other Industry	141
	Total	425

About Urla Industrial Cluster

Urla Industrial Area is situated on the outskirts of Raipur City and National Highway No. 200 which is spread over an area of approx. 395.563 ha with allotable land 251.483 ha (allotted land 251.483 ha). It is fairly developed industrial area having 15 km cement concrete road and 05 km back top road, surface drainage of 9 km, water supply network of 01 MGD including treatment plant and overhead tanks. Roads of industrial area are pucca. Water sprinkling on roads is being practiced daily. In Urla Industrial Area, 440 industrial units were allotted land; out of which, 400 are working and 40 are closed.

Urla Industrial Cluster includes peripheral areas of Villages Sarora, Sondongri, Gondwara, Gogoan, Achholi-2, Borjhara, Birgaon, Bhanpuri etc. Urla Industrial Cluster map is shown in fig.-I.

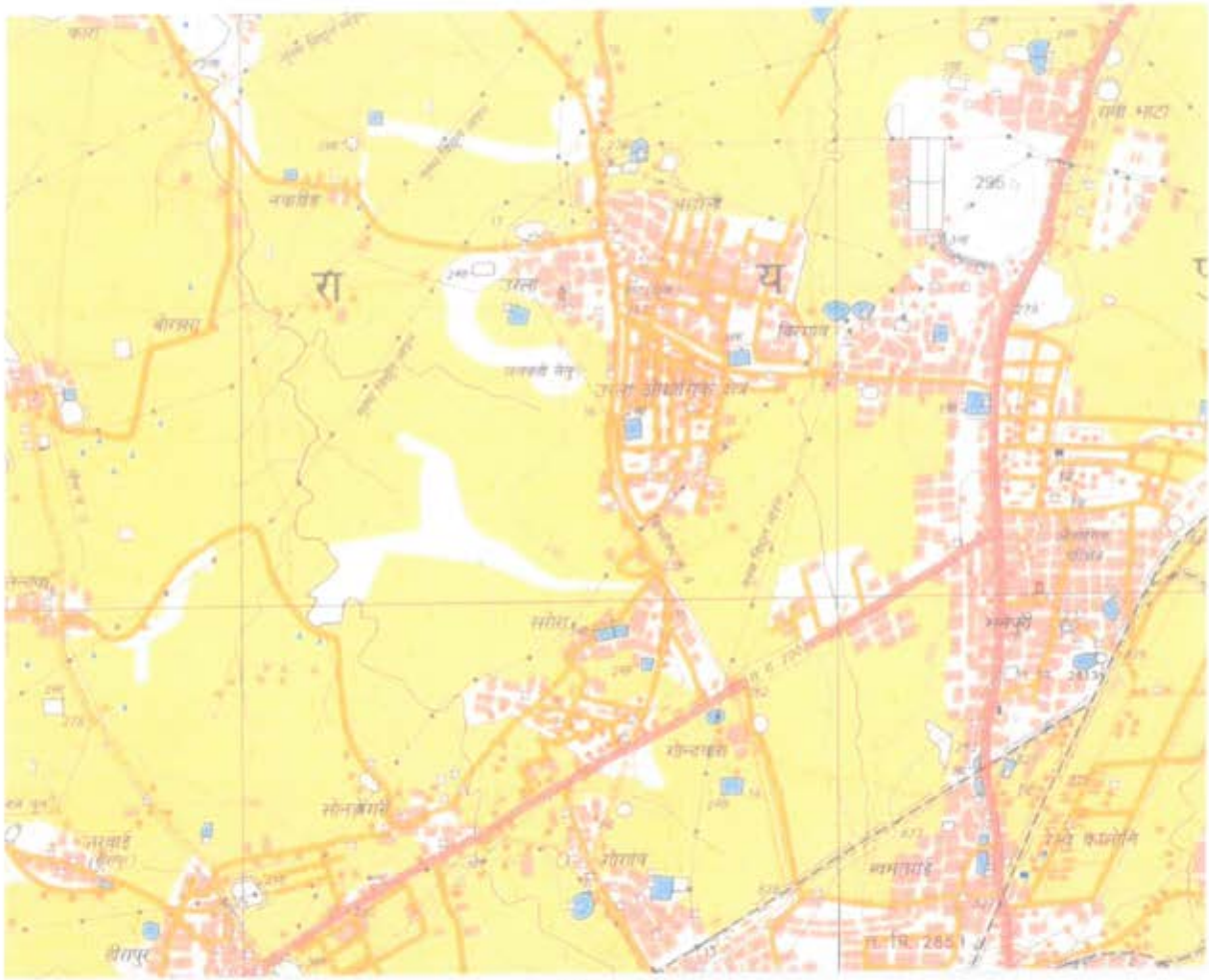


Fig.-I

Major industries located in the cluster area are Sponge Iron Plants, Power Plants, Ferro Alloy Plants, Induction Furnaces, Rolling Mills, Solvent Extraction Units etc. In Urla Industrial Cluster, there are 75 red category and 375 orange category industries (polluting in nature) of major, medium and small scale industries. List of major and medium scale industries (red and orange category) is as follows:-

Red Category

S.No.	Industry Name	Type
1.	M/s Sita Ispat & Power Private Limited, Village-Borjhara, Guma, Urla Road, District - Raipur	Sponge Iron
2.	M/s Shri Bajrang Power & Ispat Limited, Village-Borjhara, Guma Urla Road, District - Raipur	Sponge Iron, Coal Washery
3.	M/s Shilphi Steels Private Limited, Village- Sarora, District - Raipur	Sponge Iron
4.	M/s Satyarth Steel Private Limited, Village-Borjhara, District - Raipur	Sponge Iron
5.	M/s Real Ispat & Power Limited, Village- Borjhara, District - Raipur	Sponge Iron, Power Plant,

		Induction Furnace and Rolling Mill
6.	M/s Gravity Traxim Private Limited, Village-Achholi, District - Raipur	Sponge Iron
7.	M/s Uniworth Limited (Dying Division) Urla Industrial Area, District - Raipur	Textile
8.	M/s Uniworth Textiles Limited Village- Sarora, District - Raipur	Textile
9.	M/s Uniworth Limited (Yarn Division) Urla Industrial Area, District - Raipur	Textile
10.	M/s Uniworth Limited (Power Division) Urla Industrial Area, District - Raipur	Power Plant
11.	M/s RSPL Limited Plot No.- 31-37, Kanhera Road, Village-Acholi, Urla Industrial Area, District - Raipur	Detergent
12.	M/s IMI Abresips Private Limited, Urla Industrial Area, District - Raipur	Ferro Alloys
13.	M/s Hira Power & Steel Limited (Formerly known as- M/s Jain Corboid & Chemicals Limited) Industrial Area Urla, District - Raipur	Ferro Alloys and Power Plant
14.	M/s Indsil Hydro Power & Maganese Limited, Urla Industrial Area, District - Raipur	Ferro Alloys
15.	M/s Alok Ferro Alloys Limited, Urla Industrial Area District - Raipur	Ferro Alloys and Power Plant
16.	M/s Hira Ferro Alloys, Unit-2, Urla Industrial Area, District - Raipur	Ferro Alloys and Power Plant

Orange Category

S.No.	Industry Name	Type
1.	M/s Bhilai Engineering Corporation Limited, Urla Industrial Area, District - Raipur.	Fabrication Unit
2.	M/s Mahamaya Ispat Limited, Urla Industrial Complex , Raipur	Induction Furnace
3.	M/s Vision Textile Private Limited, Urla Industrial Area, District - Raipur	Woven Sacs
4.	M/s Rozar Power Technologies Private Limited, Plot No.- 704, 705, Urla Industrial Area, District - Raipur	Woven Sacs
5.	M/s Gravity Ferrous Private Limited (Unit-1), Village- Achholi, District - Raipur	Induction Furnace
6.	M/s Gravity Ferrous Private Limited (Unit-2),	Induction

	Village- Achholi, District - Raipur	Furnace
7.	M/s Ishwar Ispat Private Limited, (Unit-6) (Formerly known as –M/s G.P. Ispat Private Limited, (Unit-2) Urla Industrial Area, District - Raipur	Rolling Mill
8.	M/s Ishwar Ispat Private Limited, (Unit-4) (Formerly known as –M/s G.P. Ispat Private Limited, (Unit-1) Urla Industrial Area, District - Raipur	Rolling Mill
9.	M/s Sarthak Ispat Private Limited, Village- Sarora, Urla Industrial Area, District - Raipur	Rolling Mill
10.	M/s Vindhyavashini Industries Private Limited, Urla Industrial Area. District - Raipur	Induction Furnace
11.	M/s Prakash Industries Limited, New Industrial Area, Gogaon, District - Raipur	Rolling Mill
12.	M/s Shri Bajrang Power & Ispat Limited, Village-Gondwara, Urla Industrial Complex, District - Raipur	Rolling Mill and Induction Furnace
13.	M/s Shri Bajrang Alloys Limited, Village- Sarora, District - Raipur	Rolling Mill
14.	M/s Alankar Alloys Private Limited, Village-Borjhara, District - Raipur	Rolling Mill and Induction Furnace
15.	M/s RR Ispat Limited, 490/1, Urla Industrial Area, District - Raipur	Rolling Mill
16.	M/s Mahamaya Steel Industries, Urla Industrial Complex, Sarora, District - Raipur	Induction Furnace
17.	M/s Simplex Castings Limited, Urla Industrial State, District - Raipur	Induction Furnace, Rolling Mill and Fabrication
18.	M/s Vandana Ispat Limited, Plot No.- 6,7,8 Sector-B, Urla Industrial Area, District - Raipur	Rolling Mill and Induction Furnace
19.	M/s Rotocast Industrial Limited, Plot No.- 591, Urla Industrial Area, District - Raipur	Induction Furnace
20.	M/s Lingraj Steel & Power Private Limited, Urla Industrial Area, Village- Gondwara, District - Raipur	Rolling Mill
21.	M/s Ador Welding Limited, Bilaspur Road, Industrial Estate, Bhanpuri, District - Raipur (C.G.)	Arc Welding Electrodes and Continuous Welding Consumables

The above industries are mainly air and water polluting. These industries have provided necessary air pollution control systems and effluent treatment systems within their premises.

Kharun River

Kharun is one of the important tributary of Seonath River. Seonath sub-basin is one of the important sub-basins of Mahanadi River. Kharun River basin falls in Durg, Raipur and Dhamtari districts. The Kharun River basin is situated between 20°38' N to 21°36'N Latitude and 81°20' to 81°55'E Longitude. Kharun River originates from Petechua in the South-East of the Durg district and after flowing about 129 km joins Seonath River near Somnath in Raipur district.

The catchment area of Kharun River basin is 4112 sqkm. It flows to the west of Raipur town towards south to north and supplies water to Raipur city through a small storage Bhatagaon anicut. It is supplemented from Ravi Shankar Sagar reservoir situated at Dhamtari on Mahanadi River. The major part of Kharun River basin comes under command area of Ravi Shankar Sagar reservoir and small part under Tandula reservoir. The main types of land use and land cover are agriculture, forest, settlements, barren etc. and main crops are paddy, oilseeds, wheat, gram and vegetable.

Kharun is originally an intermittent river having no flow during lean season. Moreover there has been no water storage structure at the upstream. To tackle the situation, the Kharun River is being supplemented from Ravi Shankar Sagar reservoir through canals to meet various water demands and water supplied for various usages through series of anicuts.

Load Carrying Capacity Study

Chhattisgarh Environment Conservation Board has entrusted the Study of Load Carrying Capacity in Raipur Region to IIT Bombay. The study was carried out in 25 km radius during 2016-2017. Major findings of study are as follows:-

1. Total pollutant emission and contribution from different sources:-

Source	Pollutant in kg/day				
	PM_{10}	$PM_{2.5}$	NO_x	SO_x	CO
Point	13498	6844	-	-	-
Area	3731	369	1348	78	73262

Line	8466	1176	13914	-	59813
Total	**25695**	**8389**	**15262**	**78**	**133075**

2. The study area had already reached its assimilative capacity with respect to air quality.
3. For emission of PM_{10} the contribution of point source – 52.5%, line source – 33% and area source – 14.5%.
4. For emission of $PM_{2.5}$ the contribution of point source – 81.6%, line source – 14% and area source – 4.4%.
5. Sponge iron plants, ferro alloys industries and rolling mill, are major point sources of air pollution in study area.
6. Coal and firewood burning were major area sources of air pollution.
7. Multi axle vehicles, mini buses, multi utility vehicles were major line sources of air pollution.
8. Waste water modeling suggests that overall quality of the Kharun River was acceptable; however, continuous discharge of untreated domestic wastewater (sewage) may deteriorate the water quality over the period. Direct mixing of discharge from Chingri Nalla, Borjhara Nalla and Chokara Nalla into the Kharun River has to be avoided.
9. Air Quality Index (AQI) of the study area varied between moderate and poor.

Need of action plan

Improvement of water quality of Kharun River

Presently there is no collection network for waste water in the Raipur city. Mostly all the households are having sanitation units with septic tanks and supernatant is discharged into nearby drains, which eventually flows in 17 nallas before meeting Kharoon River at 7 locations around the city. The sewage generated in dry weather conditions are assessed and is observed that as against the supply of water to the tune of 200 MLD from Raipur Municipal Corporation and 20 MLD addition from ground water source such as borewells with additional 14 MLD from adjoining Birgaon Municipal Corporation and 12 MLD water supplied by CSIDC in the industrial area. Hence, total supply of water is 246 MLD, however the dry weather sewage flow observed at the proposed treatment sites is 164 MLD.

River Flow Observation

As per data available from State Data Center, Water Resources Department, Government of Chhattisgarh, the flow observed in Kharun River during last three years are as follows:-

River Flow Range Observed During Last Three Years

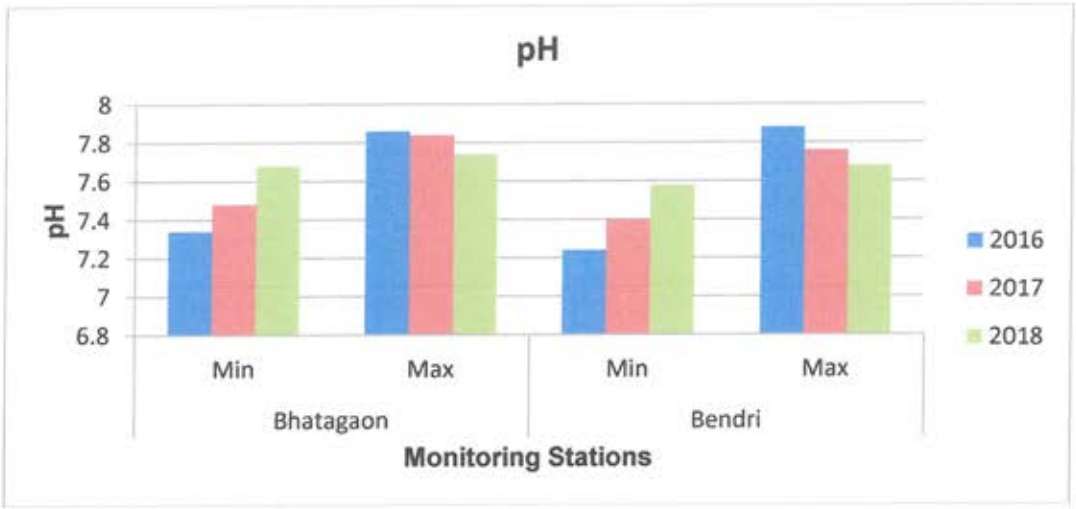
River / Location	Year	Month	Flow (in Cumecs)
Kharun/Pathardih	2014-2015	June	0-0
		July	1.67-1284
		August	14.9-1026
		September	41.6-920
		October	16.4-230
		November	0.3-16
		December	0-0
		January	0-0
		February	0-0
		March	0-0
		April	0-0
		May	0-0
	2015-2016	June	0-166
		July	9-250
		August	6.02-24.5
		September	5-322
		October	4.52-21.5
		November	0-3.3
		December	0-0
		January	0-0
		February	0-0
		March	0-0
		April	0-0
		May	0-0
	2016-2017	June	0-0
		July	0-237
		August	7.08-1008
		September	12.2-895
		October	3.66-379
		November	0-2.7
		December	0-0
		January	0-0
		February	0-0
		March	0-0
		April	0-0
		May	0-0

Kharun River Water Quality

Water quality of Kharun River in last three years is as follows:-

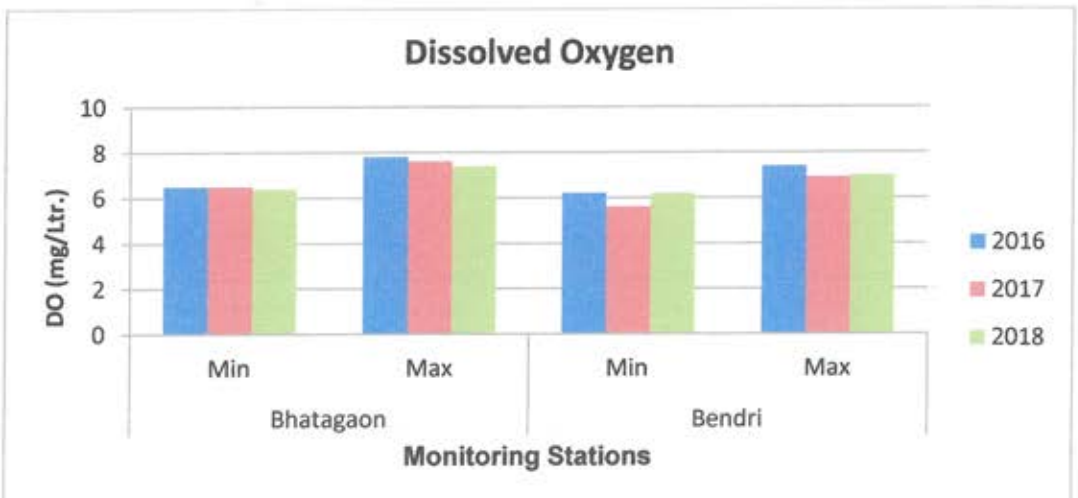
pH

Location	Bhatagaon		Bendri	
pH	Min	Max	Min	Max
2016	7.34	7.86	7.24	7.88
2017	7.48	7.84	7.4	7.76
2018	7.68	7.74	7.58	7.68



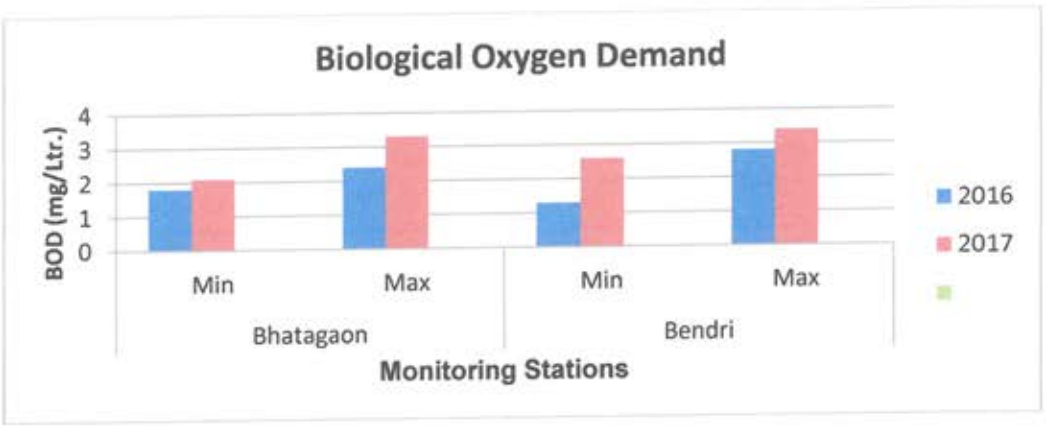
Dissolved Oxygen

Location	Bhatagaon		Bendri	
DO (mg/L)	Min	Max	Min	Max
2016	6.5	7.8	6.2	7.4
2017	6.5	7.6	5.6	6.9
2018	6.4	7.4	6.2	7



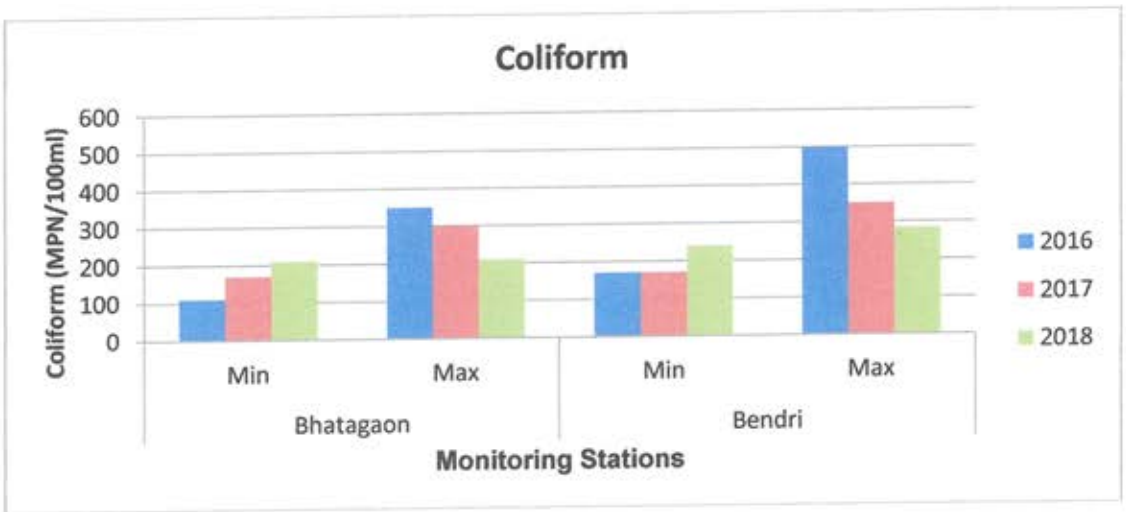
Biological Oxygen Demand

Location	Bhatagaon		Bendri	
BOD (mg/L)	Min	Max	Min	Max
2016	1.8	2.4	1.3	2.8
2017	2.1	3.3	2.6	3.4



Coliform

Location	Bhatagaon		Bendri	
Coliform (MPN/100ml)	Min	Max	Min	Max
2016	110	350	170	500
2017	170	300	170	350
2018	210	210	240	284



Kharun River Water Quality as per Study of Load Carrying Capacity

As per Study of Load Carrying Capacity in Raipur Region conducted by IIT Bombay during 2016-2017 water quality of Kharun River at different locations is as follows:-

Location	Water Quality		
	Summer	Post Monsoon	Winter
Near Parsulidih	-	Excellent	Excellent
Near Sonpur Village	-	Good	Good
Near Khatti Village	-	Good	Good
Near Tola dhan	-	Excellent	Excellent
Near Mundara Village	-	Good	Good
Near Kushabhau Thakur College	-	Excellent	Excellent
Near Khurmuda Ghat	-	Excellent	Excellent
Bhatagaon	Good	Excellent	Excellent
Upstream of Mahadev Ghat	Poor	Good	Poor
Downstream of Mahadev Ghat	Poor	Good	Poor
At inter section of Raipur, Bhilai - Durg express way	-	Excellent	Good
Near Bana Village	Good	Good	Good
Near Bendri	-	Excellent	Good
Near Kumhari-1	-	Good	Good
Near Munrethi Village	-	Good	Good
Between Parastarai and Baratnara Village	-	Good	Good
Near Murra Village	-	Good	Good

The above study reveals that in most of the location water quality is relatively good in the river Kharun. Although the overall quality of river

Kharun is good; however, continuous discharge of untreated domestic and industrial waste may deteriorate the quality of river on long term. There is need to implement the preventive measures such as installation of sewage treatment plants for domestic waste water and enforce industries to use effluent treatment plant before effluent discharge into the river.

Sewage Treatment Plants

Sewage treatment system has been planned for 206 MLD. Four sewage treatment plants have been proposed as follows:-

(a) 75 MLD at Chandandih (near Atari Nala)

(b) 35 MLD at Kara (near the confluence of Tendua Nala and Kharun River)

(c) 90 MLD at Nimora (near the confluence of Chhokra Nala with Kharun River)

(d) 06 MLD at Bhatagaon

The sewage treatment plants at Chandandih, Kara and Nimora have been included in "AMRIT MISSION". The construction of these STPs is in progress. Sewage treatment plant at Bhatagaon is being constructed by Municipal Corporation Raipur. The sewage generated and flowing through different nallas from Raipur city and areas of Urla industrial cluster will be treated in these sewage treatment plants.

The effluent generated from water polluting industries in the Urla industrial cluster have their own effluent treatment plants and the treated effluent is being used within their industrial premises for cooling, gardening etc. No effluent is being discharged outside the premises. Chhattisgarh Environment Conservation Board shall keep regular vigil to ensure zero discharge condition to avoid mixing of effluent with the Kharun River.

Improvement of Ambient Air quality

Major Sources of Air Pollution:-

Major sources responsible for degradation in ambient air quality are industrial air pollution, vehicular emission, road dust/re-suspension of dust and other fugitive emission, air pollution from construction and demolition activities, burning of municipal solid waste and plastic waste etc. Number of

vehicles plying on Raipur roads have also increased manifold. It has been recognized that Raipur is facing environmental pollution problems, mainly air pollution caused by number of air polluting industries viz. sponge iron, ferro alloys, power plants and rolling mills. The problem is further aggravated due to increased vehicular movement, bad condition of roads, poorly maintained vehicles, and increased construction activities.

Ambient Air Quality of the Area

Ambient Air Quality of the area monitored by Chhattisgarh Environment Conservation Board (CECB) under NAMP and data of Continuous Ambient Air Quality Monitoring Stations (**CAAQMS**) are as follows:-

AMBIENT AIR QUALITY MONITORING BY CECB (NAMP STATIONS)

Year 2016

Station - Regional Office, CECB, New H.I.G. 9, Hirapur, Raipur

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	138.90	11.58	31.95
February	130.66	11.17	31.52
March	128.00	10.52	31.00
April	121.33	10.50	29.41
May	120.55	10.02	28.42
June	117.50	10.51	29.29
July	103.93	10.10	25.64
August	103.75	8.93	24.50
September	100.45	8.68	24.31
October	120.84	9.68	27.73
November	149.08	12.35	33.97
December	130.55	24.19	38.61
Average	**122.13**	**11.52**	**29.70**
Standard	**60**	**50**	**40**

Year 2016

Station - Wool Worth (I) Limited - Sarora, Raipur

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	185.92	12.69	34.59
February	177.93	12.24	33.16
March	175.72	12.00	32.10
April	168.00	11.94	32.66
May	162.85	12.10	32.43

June	162.04	11.85	32.09
July	150.17	11.31	27.28
August	150.43	11.25	28.62
September	145.45	10.86	28.27
October	151.60	11.40	34.05
November	179.75	14.33	37.33
December	-	-	-
Average	**164.53**	**12.00**	**32.05**
Standard	**60**	**50**	**40**

AMBIENT AIR QUALITY MONITORING (CAAQMS)

Year 2016

Station - Collectorate Parisar, Raipur

Month	PM10 (µg/m3)	PM 2.5 (µg/m3)	SO_2 (µg/m^3)	NO_x (µg/m^3)
January	123.92	59.09	20.67	56.74
February	75.12	31.99	10.50	55.78
March	68.87	38.47	21.13	16.29
April	62.63	50.11	20.88	09.25
May	96.28	49.48	21.32	7.61
June	111.64	49.81	23.73	7.62
July	40.18	19.59	19.96	3.58
August	65.34	22.73	10.12	18.39
September	58.37	20.43	18.28	12.47
October	170.22	59.58	31.79	23.82
November	197.21	83.53	42.92	36.15
December	-	-	-	-
Average	**97.25**	**44.07**	**21.94**	**22.52**
Standard	**60**	**40**	**50**	**40**

Year 2016

Station - NIT Raipur*

Month	PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)	SO_2 (µg/m^3)	NO_x (µg/m^3)
November	77.91	-	4.39	45.95
December	110.25	64.11	2.72	13.57
Standard	**60**	**40**	**50**	**40**

* CAAQMS at N.I.T., Raipur became operational from October 2016.

AMBIENT AIR QUALITY MONITORING BY CECB (NAMP STATIONS)

Year 2017

Station - Regional Office, CECB, Housing Board Complex, Kabir Nagar, Raipur

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	174.88	12.50	33.75
February	169.52	11.75	32.24
March	160.48	11.65	30.57
April	111.99	9.71	26.40
May	66.05	8.94	24.11
June	48.22	7.69	21.03
July	31.82	6.28	17.25
August	29.50	5.90	15.77
September	34.11	7.75	16.62
October	47.41	9.23	19.32
November	75.87	13.05	18.33
December	82.92	-	-
Average	**86.06**	**9.50**	**23.22**
Standard	**60**	**50**	**40**

Year 2017

Station - Wool Worth (I) Limited - Sarora, Raipur

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	191.62	13.97	36.68
February	188.20	13.36	34.66
March	184.08	12.95	34.00
April	136.19	11.71	31.61
May	70.88	10.40	27.84
June	54.78	9.02	25.81
July	36.00	8.09	20.48
August	34.66	8.00	19.88
September	38.87	8.65	18.87
October	60.55	12.65	22.11
November	88.96	15.11	21.66
December	96.33	-	-
Average	**98.43**	**11.02**	**25.78**
Standard	**60**	**50**	**40**

AMBIENT AIR QUALITY MONITORING (CAAQMS)

Year 2017

Station - Collectorate Parisar, Raipur

Month	PM10 (µg/m3)	PM 2.5 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)
January	99.98	52.33	38.54	33.14
February	91.04	42.16	34.92	45.11
March	80.63	45.45	34.32	39.78
April	62.42	45.55	21.45	25.99
May	70.25	47.77	20.55	22.45
June	48.05	24.62	13.68	17.86
July	36.56	18.80	13.39	17.49
August	33.86	19.68	11.92	12.95
September	38.71	17.15	12.02	12.29
October	57.35	31.56	22.95	14.96
November	84.93	38.66	30.83	23.99
December	87.73	41.42	32.23	23.96
Average	**65.96**	**35.43**	**23.90**	**24.16**
Standard	**60**	**40**	**50**	**40**

Year 2017

Station - NIT, Raipur

Month	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)
January	93.96	51.60	20.36	21.80
February	84.63	38.42	30.56	39.61
March	76.81	42.38	31.24	36.92
April	59.65	40.22	18.86	22.74
May	57.44	36.83	12.38	13.58
June	54.81	23.45	8.10	12.82
July	31.91	15.19	8.19	13.06
August	34.22	19.28	8.94	12.50
September	35.96	17.10	12.10	12.70
October	52.88	26.47	19.10	16.80
November	73.89	32.74	20.10	16.65
December	75.74	36.40	25.63	14.14
Average	**60.99**	**31.67**	**17.96**	**19.44**
Standard	**60**	**40**	**50**	**40**

AMBIENT AIR QUALITY MONITORING BY CECB
(NAMP STATIONS)

Year 2018

Station - Regional Office, CECB, Housing Board Complex, Kabir Nagar, Raipur

Month	PM 10 ($\mu g/m^3$)	PM 2.5 (Avg.) ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	86.58	-	-	-
February	80.43	-	13.58	20.91
March	77.55	-	13.25	13.80
April	78.61	-	12.17	14.17
May	62.50	-	11.16	14.33
June	44.20	-	10.18	14.00
July	39.10	-	9.72	15.21
August	37.15	-	9.23	13.66
September	41.56	-	10.59	15.31
October	47.95	-	12.78	19.31
Average	**59.56**	**-**	**11.41**	**15.63**
Standard	**60**		**50**	**40**

Year 2018

Station - Wool Worth (I) Limited - Sarora, Raipur

Month	PM 10 ($\mu g/m^3$)	PM 2.5 (Avg.) ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	93.23	-	-	-
February	90.21	-	18.41	25.33
March	84.59	-	16.04	22.06
April	78.61	-	14.42	21.73
May	69.50	-	13.48	19.73
June	53.05		12.29	18.50
July	52.00		12.66	16.41
August	-	-	-	-
September	44.60	-	12.67	17.60
October	57.40	-	14.18	21.47
Average	**69.24**	**-**	**14.27**	**20.35**
Standard	**60**		**50**	**40**

AMBIENT AIR QUALITY MONITORING (CAAQMS)

Year 2018

Station - Collectorate Parisar, Raipur

Month	PM10 (µg/m3)	PM 2.5 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)
January	87.37	40.38	30.29	20.53
February	78.17	35.00	28.28	23.35
March	74.42	36.29	27.28	19.94
April	54.34	29.97	16.03	11.79
May	61.04	37.74	19.11	20.19
June	49.04	26.89	12.85	16.77
July	35.47	18.23	13.03	16.89
August	31.72	19.15	11.10	12.22
September	35.04	16.53	12.01	12.44
October	40.63	23.49	19.02	14.29
Average	**54.72**	**28.36**	**18.90**	**16.84**
Standard	**60**	**40**	**50**	**40**

Year 2018

Station - NIT, Raipur

Month	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)
January	76.90	35.61	24.07	13.45
February	72.77	32.50	25.56	13.40
March	69.70	33.06	22.27	11.76
April	59.31	37.35	20.06	21.76
May	50.73	26.46	13.02	11.44
June	45.86	23.42	9.23	12.10
July	30.79	14.59	08.47	12.80
August	29.93	16.20	07.95	10.39
September	31.70	14.56	10.26	10.80
October	36.62	20.23	16.06	12.35
Average	**50.43**	**25.39**	**15.69**	**13.02**
Standard	**60**	**40**	**50**	**40**

Ambient Air Quality As Per Study of Load Carrying Capacity

As per Study of Load Carrying Capacity in Raipur Region conducted by IIT Bombay during 2016-2017 ambient air quality of in Urla Industrial Area at different locations is as follows:-

Location	Season	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	AQI
Urla Industrial Area (Near Urla Sub Station)	Summer	232	37	15	07	188
	Post Monsoon	218	94	21	51	213
	Winter	247	131	44	54	308
Urla Industrial Area (Near M/s Ultra Aluminum Private Limited)	Summer	245	57	18	09	197
	Post Monsoon	232	77	18	14	118
	Winter	204	126	39	66	305

The above study reveals that concentration of PM_{10} and $PM_{2.5}$ are more than as prescribed in National Ambient Air Quality Standards and SO_2 & NO_2 are within standards in Urla Industrial Cluster. Air Quality of the above area falls under moderately polluted category in summer season, moderately polluted to poor in post monsoon season and very poor in winter season.

Therefore, it is necessary to take adequate measures for improvement of ambient air quality of the industrial cluster in integrated manner to meet the National Ambient Air Quality Standards and maintaining Kharun River water quality. Hence, following action plan is being proposed by different implementing agencies.

ACTION PLAN FOR URLA INDUSTRIAL CLUSTER

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
VEHICLES	Restriction on plying and phasing out of 15 years old commercial diesel driven vehicles.	Mid	-	Transport Department	1. The Power to fix life of a vehicle lies with Central Government only under section 59 of CMV Act. It is in process of deliberation on a scrapping policy for vehicles. 2. State Government laid down age limit for permit condition for buses (12 years) and trucks (15 years). The CG Motor Vehicle Rule 70A contained provision related to age limit for permit of buses. It has been struck down by Hon'ble High Court of CG in its order in WPC

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
					No. 2004/2017 on 26-07-2018. 3. No permit is being given in urban and rural areas to Autos older than 10 years and 12 years respectively.
	Regular checking of vehicular emission and issue of Pollution under Control Certificate (PUC).	Short	May 2019	Transport Department and Police Department	-
	Periodic calibration test of vehicular emission monitoring instrument.	Short	June 2019	Transport Department	As per MoRTH direction, computerized and networked system of pollution checking has to be introduced from 1st April 2019.
	Good traffic management including redirection of traffic movement to avoid traffic congestion.	Short	June 2019	Transport Department and Police Department	-
	Promotion and operationalization of E-rickshaw.	Short	June 2019	Transport Department and Urban Administration and	-

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
				Development	
	Monitoring on vehicle fitness.	Short	June 2019	Transport Department	-
	Checking of fuel adulteration.	Immediate	Immediate	Food and Civil Supply Department/Oil Companies	-
	Restriction on overloading of vehicles.	Immediate	Immediate	Transport Department	-
ROAD DUST	Regular cleaning of road dust in the industrial cluster.	Short	June 2019	CSIDC/ CGPWD/Urban Administration and Development / NHAI / Panchayat and Rural Development Department	-
	Water spraying on roads through tankers in the industrial cluster.	Short	June 2019	CSIDC/ CGPWD/Urban Administration and Development / NHAI / Panchayat and Rural Development Department	-
	Maintenance of roads in the industrial cluster to avoid dust emission.	Mid	July 2019	CSIDC/ CGPWD/Urban Administration and Development / NHAI / Panchayat and Rural Development Department	-
	Plantation / green belt development	Mid	Coming Monsoon	CECB/Concern Government	-

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	in open areas, gardens, parks / community places, schools & housing societies of the industrial cluster.			Departments / Urban Administration and Development / Industrial Units / Panchayat and Rural Development Department	
	Plantation / green belt development in open areas of Urla Industrial Area.	Mid	Coming Monsoon	CSIDC / Industrial Units / CECB	-
	Introduction of water fountains at major traffic intersection / circle.	Short	June 2019	Urban Administration and Development / CSIDC / Panchayat and Rural Development Department	-
CONSTRUCTION ACTIVITIES	Covering of construction site.	Short	June 2019	Urban Administration and Development / Town and Country Planning Department / CSIDC	-
	Transportation of construction materials like sand, soil, stone chips etc. in covered system.	Immediate	April 2019	Transport Department and Police Department	-
	Restriction on storage of	Short	May 2019	Urban Administration and	-

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	construction materials along the road.			Development / Town and Country Planning Department / CSIDC / Panchayat and Rural Development Department	
BIOMASS AND GARBAGE BURNING	Restriction on open burning of municipal solid waste, Biomass, plastic horticulture waste etc.	Immediate	Immediate	Urban Administration and Development / CSIDC / Panchayat and Rural Development Department	-
	Transportation of Municipal Solid Wastes, construction materials and debris in covered system.	Immediate	Immediate	Urban Administration and Development / Panchayat and Rural Development Department	-
	Ensuring promotion and use of cleaner fuel for commercial purposes like local dhabas / eateries.	Short	June 2019	District Administration/Oil Companies	-
INDUSTRIES	Ensuring installation and effective operation of pollution control devices, ensuring emission standards in industries and	Immediate	Immediate	CECB	-

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	taking stringent action against violating industries.				
	Control of fugitive dust emission from industries. ➢ Minimizing the height of raw materials / coal / solid wastes drop to the stockpile and ensuring water spray system.	Short	June 2019	CECB / All Industries	
	➢ Use of water spray systems / dust suppression systems / chemical fog systems / rain guns in crusher, screen, raw materials, fuel, solid wastes storage areas & yards and handling / conveying systems.	Short	June 2019	CECB / All Industries	

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	➢ Storage of solid wastes from pollution control systems like bag filter / scrubber in pucca and covered area and ensuring environmentally safe disposal of these wastes through transportation in covered vehicles.	Immediate	April 2019	CECB / All Industries	
	➢ Ensuring transportation of iron ore, sponge iron, coal, fly ash, washed coal / reject coal in covered vehicle.	Immediate	April 2019	CECB / All Industries	
	➢ Ensuring short time storage of solid waste within premises and regular disposal in environmentally safe manner.	Immediate	April 2019	CECB / All Industries	

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	➢ Ensuring properly maintained pucca internal roads. Ensuring regular cleaning of dust and water sprinkling on internal roads.	Short	June 2019	CECB / All Industries	
	➢ Use of mechanized sweeping machine at integrated steel plants, sponge iron plants and power plants.	Mid	August 2019	CECB / All Concerned Industries	
	Increasing the height of all stacks attached to emission sources such as auxiliary process equipment / bag filter / scrubber to minimum 30 meter.	Mid	August 2019	CECB / All Industries	
	Ensuring use of all treated effluent within plant premises and no discharged outside the premises of any effluent. Ensuring no mixing of any treated / untreated	Immediate	April 2019	CECB / All Industries	

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	effluent from industries in any nalla / kharun rivier.				
	Provisions of wind breaking wall, installation of rain gun, wheel washing arrangement, treatment of wash water and arrangement of CCTv cameras at coal / washed coal / reject coal handling and storage areas, entrance and exit gates in all coal washeries.	Mid	August 2019	CECB / All Coal Washeries	
STRENGTHENING AAQ MONITORING	Installation of two CAAQMS in industrial cluster area.	Long	March 2020	CECB / Industrial Units	-
	Installation of two CWQMS in Kharun River.	Long	March 2020	CECB / Industrial Units	-
PUBLIC AWARENESS	Issue of advisory to public for prevention and control of air pollution.	Immediate	March 2019	CECB	-
	Involvement of school and other academic institution in	Short	June 2019	CECB	-

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	awareness program.				
OTHERS	Providing web portal for redressal of public complaints.	Immediate	April 2019	CECB	-

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Action Plan for Restoration of Environmental Qualities within Norms in Polluted Industrial Clusters of Chhattisgarh State

Introduction

The Hon'ble NGT, Principal Bench, New Delhi in the matter of O.A. No. 1038/2018 in the matter of News item published in "The Asian Age" Authored by Sanjay Kaw titled "CPCB to rank industrial units on pollution levels" on dated 13/12/2018 order that "the SPCBs/Committees to finalize the time bound action plans with regard to identified polluted industrial clusters in accordance with the revised norms laid down by the CPCB to restore environmental qualities within norms. Such action plan be finalized within three months from the date of receipt of copy of this order. In case of any left-out/missed areas in addition to 100 areas also, SPCBs should undertake CEPI assessment and formulate action plans."

Hon'ble NGT, also directed that "the action plan to be prepared in the States may be done by the Committee constituted by the Chief Secretary within one month from today as several Departments may be involved in the exercise. The final preparation of the action plan including its execution may be overseen by the Chief Secretary of the concerned State, along with the other connected major environmental issues of the States, such as pollution of river stretches, non-attainment cities in terms of air quality and solid waste management, utilization of treated sewage....." The Chief Secretary will take meetings on all these issues once in three months (quarterly) and will forward Report to Hon'ble NGT by e-mail.

Constitution of Committee

In compliance to above direction an Inter-Departmental Committee has been constituted by Housing and Environment Department, Government of Chhattisgarh vide order no. F 4-4/2018/ 32, dated 24/01/2019 **(Annexure-I)** consisting of following members:-

1. Special Secretary (Independent Charge), Government of Chhattisgarh, Housing and Environment Department
2. Commissioner/Additional Transport Commissioner
3. Director Industry, Directorate of Industries

4. Director, Urban Administration and Development
5. Director Agriculture, Directorate of Agriculture
6. Member Secretary, Chhattisgarh Environment Conservation Board

Polluted Industrial Clusters

In the Chhattisgarh State, four polluted industrial clusters namely Urla, Siltara, Korba and Bhilai have been identified by CPCB. Urla and Siltara industrial clusters are in the Raipur Districts. Korba and Bhilai industrial clusters are in the Korba and Durg Districts respectively.

SILTARA INDUSTRIAL CLUSTER

Introduction

Raipur is the capital and the largest city of Chhattisgarh State. It was formerly a part of Madhya Pradesh before the State of Chhattisgarh was formed on 1st November, 2000. Raipur district is surrounded by Baloda-Bazar- Bhatapara district in North, Dhamtari and Gariyaband districts in South, Mahasamund district in East and Durg and Bemetara districts in West. Total area of Raipur district is 2,91,437000 ha. As per 2011 census, total population of the Raipur district is 21,60,876 having urban population of 12,76,652 and rural population of 8,84,224.

Forest cover in Raipur district is very less compared to other districts (Bilaspur, Dhamtari and Mahasamund) of central region. There are mostly open forests in Raipur district. Most of the forest cover is in eastern and southern part of the district. There are two wildlife sanctuaries in Raipur forest division – Barnawapara Wildlife and Udanti Wildlife Sanctuary. Total forest cover in Raipur and Dhamtari districts is 5459 sqkm. However, there are sparsely distributed trees with negligible forest cover within 25 km radius in Raipur. The details of forest cover within 25 km radius of Raipur are given in the following table:-

Area	Geographic (GA)	Forest Cover	% of GA
Within 25 km radius of Raipur	1964	-	-

Raipur & Dhamtari District	16468	5459	33.11
Chhattisgarh State	135191	55586	41.12

Raipur is the biggest agricultural produce market, industrial hub and eminent cultural platform of Chhattisgarh State. Raipur is the largest market of steel in India. Raipur houses one of the biggest iron markets in India.

As per 2011 census population of Raipur city is 10,48,112, which was 6,97,013 in the year 2001. This enhancement in the population is mainly because of formulation of new Chhattisgarh State in the year 2000. Raipur is well connected by roads, railways and air. It has become more prominent after the setup of Atal Nagar, the new capital city. The total area of Raipur city is 142 sqkm which further expands to 226 sqkm after addition of 7 adjoining villages to its boundaries.

The topography of the area is almost flat to gently sloping towards North. The area consists of sub-dendritic drainage pattern. Average rainfall of Raipur is 1300 mm.

Chhattisgarh State is bestowed with a vast variety of mineral resources including coal, bauxite, iron ore, tin, dolomite, limestone. Large portion of lime stone reserve of Chhattisgarh is buried in Raipur and Balodabazar-Bhatapara districts. The easy availability of limestone has led to the establishment of cement industries and stone crushers in these districts.

There are eight designated industrial areas in and around Raipur City namely Urla, Borjhara, Gogaon, Rawabhata, Bhanpuri, Amaseoni, Metal Park Near Urla and Siltara. There are number of sponge iron industries and rolling mills in Raipur due to availability of iron ore in Chhattisgarh State. Ore is also imported from Northern Orissa. Major industries in Chhattisgarh State are:-

S. No.	Name of Industries	Numbers
01	Integrated Steel Plant	03
02	Sponge Iron Plant	91
03	Thermal Power Plant (Coal Based)	32

04	Thermal Power Plant (Biomass)	25
05	Alluminium Plant	01
06	Cement	10
07	Fertilizer Plant	02
08	Pulp and Paper Plant	04
09	Sugar Industry	04
10	Distillery	03
11	Coal Washery	31
12	Mine (Limestone / Coal / Iron Ore / Bauxite etc.)	78
13	Other Industry	141
	Total	425

About Siltara Industrial Cluster

Siltara Industrial Area is situated 13 km from Raipur City which is spread over an area of approx. 1184.40 ha (in two phases) with allotable land 872.812 ha (allotted land 872.812 ha). It is fairly developed industrial area having 25.6 km cement concrete road and 11.2 km black top road, water supply network of 02 MGD including treatment plant and overhead tanks. Roads of industrial area are pucca. Road cleaning is being practiced daily by using machine. In Phase-I of Siltara Industrial Area, 98 industrial units were allotted land; out of which, 95 are working and 03 are closed. Similarly, in Phase-II, total 123 industrial units were allotted land; out of which, 107 are working, 09 are for amenities & commercial activities and 07 are closed.

Siltara Industrial Cluster includes peripheral areas of Villages Sankara, Dhaneli, Giroud, Sondara, Murethi, Bahesar, Tanda, Charoda, Mandhar etc. Siltara Industrial Cluster map is shown in **fig.-I**

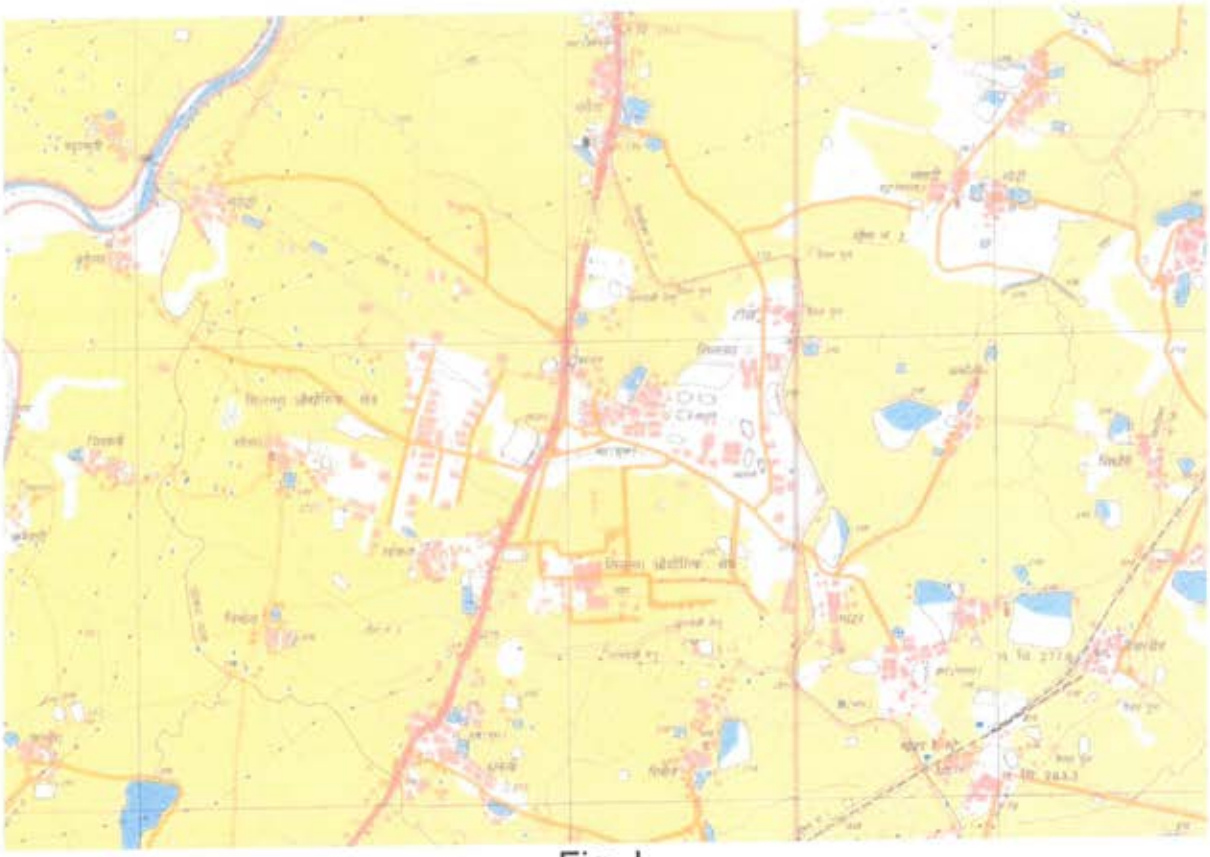


Fig.-I

Major industries located in the cluster area are Integrated Steel Plant, Sponge Iron Plants, Power Plants, Ferro Alloy Plants, Induction Furnaces, Rolling Mills etc. In Siltara Industrial Cluster, there are 56 red category and 104 orange category industries (polluting in nature) of major, medium and small scale industries. List of major and medium scale industries (red and orange category) is as follows:-

Red Category

S. No.	Industry Name	Type
1.	M/s Jaisawal Neco Industries Limited, Siltara Industrial Area, District - Raipur	Integrated Steel Plant
2.	M/s Jaisawal Neco Industries Limited (Formerly known as - Abhijeet Infrastructure Limited), Village- Girod, District- Raipur	Sponge Iron
3.	M/s Jaisawal Neco Industries Limited (Formerly known as - Corporate Ispat & Alloys Limited), Village- Giroud, District- Raipur	Sponge Iron
4.	M/s Vasvani Industries Limited, Village- Sondra, District- Raipur	Sponge Iron
5.	M/s Vandana Global Private Limited, Siltara Industrial Area, District- Raipur	Sponge Iron, Power Plant, Ferro Alloys,

		Induction Furnace & Rolling Mill
6.	M/s Euro Pratik Private Limited, Village- Tanda, Dharsiwa, District- Raipur	Sponge Iron
7.	M/s Sunil Sponge Private Limited, Village- Siltara, District- Raipur	Sponge Iron, Induction Furnace
8.	M/s S.K.S Ispat & Power Limited, Siltara Industrial Area, Phase- II, District- Raipur	Sponge Iron, Power Plant, Ferro Alloys, Induction Furnace & Rolling Mill
9.	M/s Shri Nakoda Ispat Limited, Siltara Industrial Area, Phase- II, District- Raipur	Sponge Iron, Power Plant, Ferro Alloys, Induction Furnace & Rolling Mill
10.	M/s Hare Krishna Sponge Iron Private Limited, Village - Siltara, District- Raipur	Sponge Iron, Induction Furnace
11.	M/s S.K. Sarawagi & Company Private Limited, Village- Sankara, Siltara Industrial Area, District- Raipur.	Sponge Iron, Induction Furnace & Rolling Mill
12.	M/s Raymata Ispat (India) Private Limited, Village- Charauda, District- Raipur	Sponge Iron
13.	M/s Indermani Coal Benification Energy Private Limited, 90 Siltara Industrial Growth Centre, Phase- 2, District- Raipur	Coal Washery, Sponge Iron, Induction Furnace & Rolling Mill
14.	M/s Ramniwas Ispat Pvt. Ltd. Siltara Industrial Area, District- Raipur	Sponge Iron
15.	M/s Sarda Energy & Minerals Limited, Siltara Industrial Area , District- Raipur	Sponge Iron, Pallet Plant, Ferro Alloys, Induction Furnace & Rolling Mill
16.	M/s P.D. Industries Private Limited, Village- Siltara, District- Raipur	Sponge Iron
17.	M/s N.R. Sponge Private Limited, Village- Bahesar, District- Raipur	Sponge Iron

18.	M/s Mahendra Sponge & Power Private Limited, Village- Siltara, District - Raipur	Sponge Iron & Power Plant
19.	M/s Mahamaya Sponge Iron Private Limited, Siltara Industrial Area, District- Raipur	Sponge Iron
20.	M/s Indian Steel & Power Private Limited, Village- Charoda, District- Raipur	Sponge Iron
21.	M/s Gopal Sponge & Power Private Limited, Village- Siltara, District- Raipur	Sponge Iron & Induction Furnace
22.	M/s Godawari Power & Ispat Limited, Siltara Industrial Area, District- Raipur	Sponge Iron, Power Plant & Rolling Mill
23.	M/s Ghankun Steel Private Limited, Village- Sondra, District- Raipur	Sponge Iron, Power Plant & Induction Furnace
24.	M/s Gagan Resources Private Limited. Village- Munrethi, District- Raipur	Sponge Iron
25.	M/s G.R. Sponge & Power Limited, Siltara, District- Raipur	Sponge Iron & Power Plant
26.	M/s Droliya Electro Steel Private Limited, Village- Siltara, District- Raipur	Sponge Iron, Power Plant & Induction Furnace
27.	M/s Devi Iron & Power Private Limited, Village- Tanda District- Raipur	Sponge Iron & Induction Furnace
28.	M/s Bhagwati Power & Steel Private Limited, Village- Siltara, District- Raipur	Sponge Iron, Power Plant & Induction Furnace
29.	M/s Rama Udyog Private Limited, Village- Siltara, District- Raipur	Sponge Iron
30.	M/s Aarti Sponge & Power Private Limited, Village- Munrethi, Siltara, District- Raipur	Sponge Iron & Induction Furnace
31.	M/s A.P.I. Ispat & Power Tech Private Limited, Village- Siltara, Phase- II, District- Raipur	Sponge Iron, Power Plant, Induction Furnace & Rolling Mill
32.	M/s Agrawal Sponge Private Limited, Siltara Industrial Area, District- Raipur	Sponge Iron & Induction Furnace
33.	M/s Jagdamba Power & Alloys Limited, Village- Munrethi, Siltara, District- Raipur	Power Plant

34.	M/s Maa Usha Urja Limited, Village- Giroud, District- Raipur	Power Plant
35.	M/s Usha Fuels Private Limited, Village- Dhaneli, District- Raipur	Coke Oven Plant
36.	M/s Nandan Steel & Power Limited, Village- Sondra, Industrial Areal, Siltara, District- Raipur	Induction Furnace, Rolling Mill & Galvanizing Plant

Orange Category

S. No.	Industry Name	Type
1.	M/s Indian Oil Corporation Limited (Raipur LPG Bottling Plant), Siltara, District- Raipur	LPG Bottling Plant
2.	M/s C.G. Ispat Private Limited, Village- Bahesar, Siltara Industrial Area, District- Raipur	Rolling Mill
3.	M/s Saini Industries Limited, Siltara Industrial Area, District- Raipur	Rolling Mill
4.	M/s Maruti Ferrous Private Limited, Village- Sondra, District- Raipur	Rolling Mill
5.	M/s Super Global Ltd. Siltara Industrial Area, District- Raipur	Rolling Mill
6.	M/s Hindustan Coils Ltd. Plot No.- 19 & 20 Phase-1, Siltara Industrial Area, District- Raipur	Induction Furnace & Rolling Mill
7.	M/s Jorawar Engineering & Foundry Fourz Private Limited Plot No.- 1, CSIDC Growth Centre, Phase-2, Siltara Industrial Area, Raipur	Induction Furnace & Rolling Mill
8.	M/s Ispat India Plot No. 4 & 9, Phase-2, Siltara Industrial Area, District- Raipur	Induction Furnace & Rolling Mill
9.	M/s Nikita Metalurgical Private Limited, Shed No.- 6, CSIDC, Phase-1, Siltara, Raipur	Induction Furnace

The above industries are mainly air and water polluting. These industries have provided necessary air pollution control systems and effluent treatment systems within their premises.

Kharun River

Kharun is one of the important tributary of Seonath River. Seonath sub-basin is one of the important sub-basins of Mahanadi River. Kharun River basin falls in Durg, Raipur and Dhamtari districts. The Kharun River basin is situated between 20°38' N to 21°36'N Latitude and 81°20' to 81°55'E Longitude. Kharun River originates from Petechua in the South-East of the Durg district and after flowing about 129 km joins Seonath River near Somnath in Raipur district.

The catchment area of Kharun River basin is 4112 sqkm. It flows to the west of Raipur town towards south to north and supplies water to Raipur city through a small storage Bhatagaon anicut. It is supplemented from Ravi Shankar Sagar reservoir situated at Dhamtari on Mahanadi River. The major part of Kharun River basin comes under command area of Ravi Shankar Sagar reservoir and small part under Tandula reservoir. The main types of land use and land cover are agriculture, forest, settlements, barren etc. and main crops are paddy, oilseeds, wheat, gram and vegetable.

Kharun is originally an intermittent river having no flow during lean season. Moreover there has been no water storage structure at the upstream. To tackle the situation, the Kharun River is being supplemented from Ravi Shankar Sagar reservoir through canals to meet various water demands and water supplied for various usages through series of anicuts.

Load Carrying Capacity Study

Chhattisgarh Environment Conservation Board has entrusted the Study of Load Carrying Capacity in Raipur Region to IIT Bombay. The study was carried out in 25 km radius during 2016-2017. Major findings of study are as follows:-

1. Total pollutant emission and contribution from different sources:-

Source	Pollutant in kg/day				
	PM_{10}	$PM_{2.5}$	NO_x	SO_x	CO
Point	13498	6844	-	-	-
Area	3731	369	1348	78	73262

Line	8466	1176	13914	-	59813
Total	**25695**	**8389**	**15262**	**78**	**133075**

2. The study area had already reached its assimilative capacity with respect to air quality.
3. For emission of PM_{10} the contribution of point source – 52.5%, line source – 33% and area source – 14.5%.
4. For emission of $PM_{2.5}$ the contribution of point source – 81.6%, line source – 14% and area source – 4.4%.
5. Sponge iron plants, ferro alloys industries and rolling mill, are major point sources of air pollution in study area.
6. Coal and firewood burning were major area sources of air pollution.
7. Multi axle vehicles, mini buses, multi utility vehicles were major line sources of air pollution.
8. Waste water modeling suggests that overall quality of the Kharun River was acceptable; however, continuous discharge of untreated domestic wastewater (sewage) may deteriorate the water quality over the period. Direct mixing of discharge from Chingri Nalla, Borjhara Nalla and Chokara Nalla into the Kharun River has to be avoided.
9. Air Quality Index (AQI) of the study area varied between moderate and poor.

Need of action plan

Improvement of water quality of Kharun River

Presently there is no collection network for waste water in the Raipur city. Mostly all the households are having sanitation units with septic tanks and supernatant is discharged into nearby drains, which eventually flows in 17 nallas before meeting Kharoon River at 7 locations around the city. The sewage generated in dry weather conditions are assessed and is observed that as against the supply of water to the tune of 200 MLD from Raipur Municipal Corporation and 20 MLD addition from ground water source such as borewells with additional 14 MLD from adjoining Birgaon Municipal Corporation and 12 MLD water supplied by CSIDC in the industrial area. Hence, total supply of water is 246 MLD, however the dry weather sewage flow observed at the proposed treatment sites is 164 MLD.

River Flow Observation

As per data available from State Data Center, Water Resources Department, Government of Chhattisgarh, the flow observed in Kharun River during last three years are as follows:-

River Flow Range Observed During Last Three Years

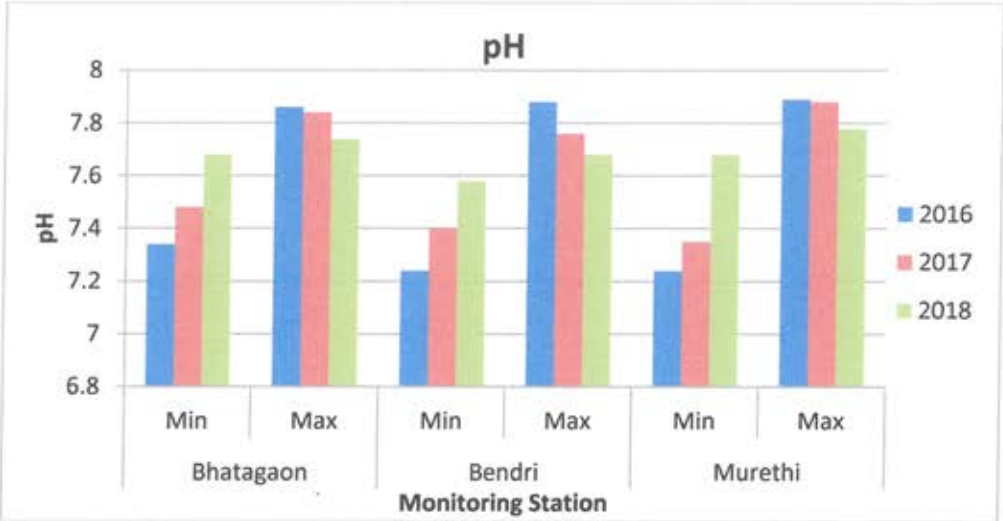
River / Location	Year	Month	Flow (in Cumecs)
Kharun/Pathardih	2014-2015	June	0-0
		July	1.67-1284
		August	14.9-1026
		September	41.6-920
		October	16.4-230
		November	0.3-16
		December	0-0
		January	0-0
		February	0-0
		March	0-0
		April	0-0
		May	0-0
	2015-2016	June	0-166
		July	9-250
		August	6.02-24.5
		September	5-322
		October	4.52-21.5
		November	0-3.3
		December	0-0
		January	0-0
		February	0-0
		March	0-0
		April	0-0
		May	0-0
	2016-2017	June	0-0
		July	0-237
		August	7.08-1008
		September	12.2-895
		October	3.66-379
		November	0-2.7
		December	0-0
		January	0-0
		February	0-0
		March	0-0
		April	0-0
		May	0-0

Kharun River Water Quality

Water quality of Kharun River in last three years is as follows:-

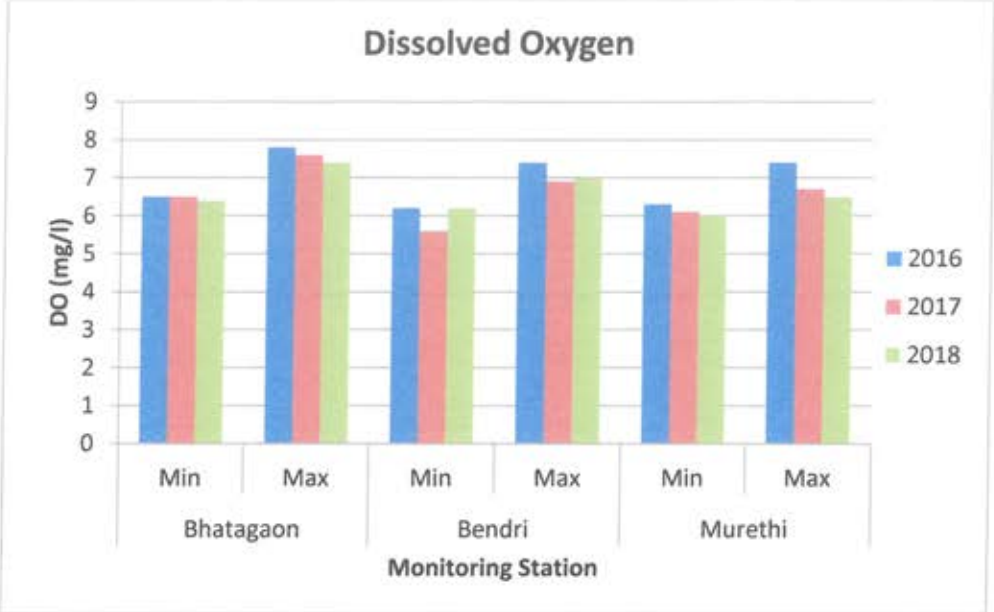
pH

Location	Bhatagaon		Bendri		Murethi	
pH	Min	Max	Min	Max	Min	Max
2016	7.34	7.86	7.24	7.88	7.24	7.89
2017	7.48	7.84	7.4	7.76	7.35	7.88
2018	7.68	7.74	7.58	7.68	7.68	7.78



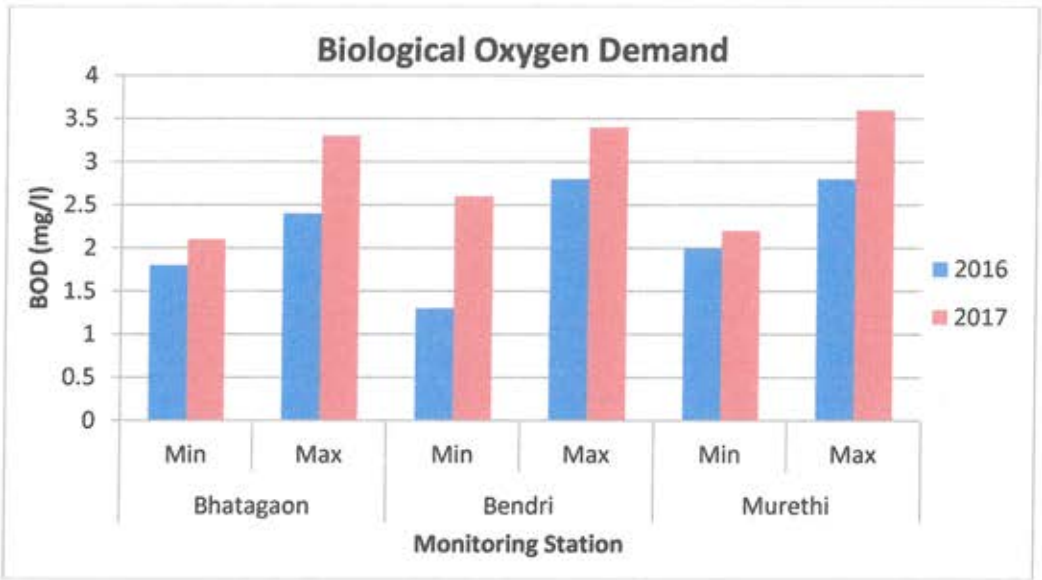
Dissolved Oxygen

Location	Bhatagaon		Bendri		Murethi	
DO (mg/L)	Min	Max	Min	Max	Min	Max
2016	6.5	7.8	6.2	7.4	6.3	7.4
2017	6.5	7.6	5.6	6.9	6.1	6.7
2018	6.4	7.4	6.2	7	6.0	6.5



Biological Oxygen Demand

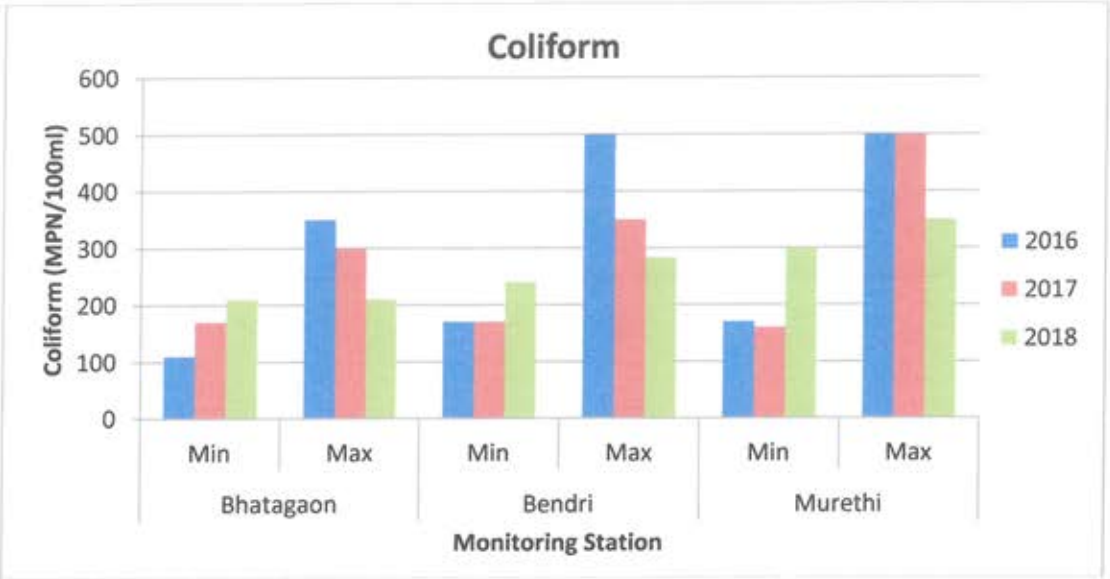
Location	Bhatagaon		Bendri		Murethi	
BOD (mg/L)	Min	Max	Min	Max	Min	Max
2016	1.8	2.4	1.3	2.8	2.0	2.8
2017	2.1	3.3	2.6	3.4	2.2	3.6



Coliform

Location	Bhatagaon		Bendri		Murethi	
Coliform (MPN/100ml)	Min	Max	Min	Max	Min	Max
2016	110	350	170	500	170	500

2017	170	300	170	350	160	500
2018	210	210	240	284	300	350



Kharun River Water Quality as per Study of Load Carrying Capacity

As per Study of Load Carrying Capacity in Raipur Region conducted by IIT Bombay during 2016-2017 water quality of Kharun River at different locations is as follows:-

Location	Water Quality		
	Summer	Post Monsoon	Winter
Near Parsulidih	-	Excellent	Excellent
Near Sonpur Village	-	Good	Good
Near Khatti Village	-	Good	Good
Near Tola dhan	-	Excellent	Excellent
Near Mundara Village	-	Good	Good
Near Kushabhau Thakur College	-	Excellent	Excellent
Near Khurmuda Ghat	-	Excellent	Excellent
Bhatagaon	Good	Excellent	Excellent
Upstream of Mahadev Ghat	Poor	Good	Poor

Downstream of Mahadev Ghat	Poor	Good	Poor
At inter section of Raipur, Bhilai - Durg express way	-	Excellent	Good
Near Bana Village	Good	Good	Good
Near Bendri	-	Excellent	Good
Near Kumhari-1	-	Good	Good
Near Munrethi Village	-	Good	Good
Between Parastarai and Baratnara Village	-	Good	Good
Near Murra Village	-	Good	Good

The above study reveals that in most of the location water quality is relatively good in the Kharun River. Although the overall quality of Kharun River is good; however, continuous discharge of untreated domestic and industrial waste may deteriorate the quality of river on long term. There is need to implement the preventive measures such as installation of sewage treatment plants for domestic waste water and enforce industries to use effluent treatment plant before effluent discharge into the river.

Sewage Treatment Plants

Sewage treatment system has been planned for 206 MLD. Four sewage treatment plants have been proposed as follows:-

(a) 75 MLD at Chandandih (near Atari Nala)

(b) 35 MLD at Kara (near the confluence of Tendua Nala and Kharun River)

(c) 90 MLD at Nimora (near the confluence of Chhokra Nala with Kharun River)

(d) 06 MLD at Bhatagaon

The sewage treatment plants at Chandandih, Kara and Nimora have been included in "AMRIT MISSION". The construction of these STPs is in progress. Sewage treatment plant at Bhatagaon is being constructed by Municipal Corporation Raipur. The sewage generated

and flowing through different nallas from Raipur city and areas of Urla industrial cluster will be treated in these sewage treatment plants. There is no big town or habitation around Siltara Industrial Cluster. Small villages viz. Sankara, Dhaneli, Giroud, Sondara, Murethi, Bahesar, Tanda, Charoda, Mandhar are situated near Siltara Industrial Cluster. Therefore sewage generated from these villages is not affecting the Kharun River water quality.

The effluent generated from water polluting industries in the Siltara industrial cluster have their own effluent treatment plants and the treated effluent is being used within their industrial premises for cooling, gardening etc. No effluent is being discharged outside the premises. Chhattisgarh Environment Conservation Board shall keep regular vigil to ensure zero discharge condition to avoid mixing of effluent with the Kharun River.

Improvement of Ambient Air quality

Major Sources of Air Pollution:-

Major sources responsible for degradation in ambient air quality are industrial air pollution, vehicular emission, road dust/re-suspension of dust and other fugitive emission, air pollution from construction and demolition activities, burning of municipal solid waste and plastic waste etc. Number of vehicles plying on Raipur and surrounding areas roads have also increased manifold. It has been recognized that Raipur and surrounding areas is facing environmental pollution problems, mainly air pollution caused by number of air polluting industries viz. sponge iron, ferro alloys, power plants, rolling mills etc. The problem is further aggravated due to increased vehicular movement, bad condition of roads, poorly maintained vehicles, and increased construction activities.

Ambient Air Quality of the Area

Ambient Air Quality of the area monitored by Chhattisgarh Environment Conservation Board (CECB) under NAMP and data of Continuous Ambient Air Quality Monitoring Stations (**CAAQMS**) are as follows:-

AMBIENT AIR QUALITY MONITORING BY CECB (NAMP STATIONS)

Year 2016

Station - Regional Office, CECB, New H.I.G. 9, Hirapur, Raipur

Month	PM10 (µg/m^3)	SO_2 (µg/m^3)	NO_x (µg/m^3)
January	138.90	11.58	31.95
February	130.66	11.17	31.52
March	128.00	10.52	31.00
April	121.33	10.50	29.41
May	120.55	10.02	28.42
June	117.50	10.51	29.29
July	103.93	10.10	25.64
August	103.75	8.93	24.50
September	100.45	8.68	24.31
October	120.84	9.68	27.73
November	149.08	12.35	33.97
December	130.55	24.19	38.61
Average	**122.13**	**11.52**	**29.70**
Standard	**60**	**50**	**40**

Year 2016

Station – CSIDC, Siltara

Month	PM_{10} (µg/m^3)	SO_2 (µg/m^3)	NO_x (µg/m^3)
January	88.33	19.71	39.39
February	125.15	20.08	35.55
March	124.07	21.20	41.35
April	118.74	23.43	40.63
May	112.92	21.14	36.98
June	120.68	21.34	31.52
July	110.18	20.08	33.37
August	112.24	22.32	34.10
September	113.05	23.43	34.82
October	114.28	23.43	36.28
November	142.33	27.90	40.63
December	165.45	29.01	42.81
Standard	**100**	**80**	**80**

AMBIENT AIR QUALITY MONITORING (CAAQMS)

Year 2016

Station - Collectorate Parisar, Raipur

Month	PM10 (µg/m3)	PM 2.5 (µg/m3)	SO_2 (µg/m^3)	NO_x (µg/m^3)
January	123.92	59.09	20.67	56.74
February	75.12	31.99	10.50	55.78
March	68.87	38.47	21.13	16.29
April	62.63	50.11	20.88	09.25
May	96.28	49.48	21.32	7.61
June	111.64	49.81	23.73	7.62
July	40.18	19.59	19.96	3.58
August	65.34	22.73	10.12	18.39
September	58.37	20.43	18.28	12.47
October	170.22	59.58	31.79	23.82
November	197.21	83.53	42.92	36.15
December	-	-	-	-
Average	**97.25**	**44.07**	**21.94**	**22.52**
Standard	**60**	**40**	**50**	**40**

Year 2016

Station - NIT Raipur*

Month	PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)	SO_2 (µg/m^3)	NO_x (µg/m^3)
November	77.91	-	4.39	45.95
December	110.25	64.11	2.72	13.57
Standard	**60**	**40**	**50**	**40**

* CAAQMS at N.I.T., Raipur became operational from October 2016.

AMBIENT AIR QUALITY MONITORING BY CECB (NAMP STATIONS)

Year 2017

Station - Regional Office, CECB, Housing Board Complex, Kabir Nagar, Raipur

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	174.88	12.50	33.75
February	169.52	11.75	32.24
March	160.48	11.65	30.57
April	111.99	9.71	26.40
May	66.05	8.94	24.11
June	48.22	7.69	21.03
July	31.82	6.28	17.25
August	29.50	5.90	15.77
September	34.11	7.75	16.62
October	47.41	9.23	19.32
November	75.87	13.05	18.33
December	82.92	-	-
Average	**86.06**	**9.50**	**23.22**
Standard	**60**	**50**	**40**

Year 2017

Station – CSIDC, Siltara

Month	PM_{10} ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	140.13	26.78	36.28
February	134.20	24.55	37.73
March	129.34	23.43	38.45
April	123.50	24.55	39.18
May	96.34	19.36	29.97
June	69.32	18.97	22.12
July	41.22	17.85	23.94
August	40.28	16.74	23.21
September	42.40	18.97	25.39
October	56.20	21.20	30.47
November	88.28	-	-
December	87.00	-	-
Standard	**100**	**80**	**80**

AMBIENT AIR QUALITY MONITORING (CAAQMS)

Year 2017

Station - Collectorate Parisar, Raipur

Month	PM10 (µg/m3)	PM 2.5 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)
January	99.98	52.33	38.54	33.14
February	91.04	42.16	34.92	45.11
March	80.63	45.45	34.32	39.78
April	62.42	45.55	21.45	25.99
May	70.25	47.77	20.55	22.45
June	48.05	24.62	13.68	17.86
July	36.56	18.80	13.39	17.49
August	33.86	19.68	11.92	12.95
September	38.71	17.15	12.02	12.29
October	57.35	31.56	22.95	14.96
November	84.93	38.66	30.83	23.99
December	87.73	41.42	32.23	23.96
Average	**65.96**	**35.43**	**23.90**	**24.16**
Standard	**60**	**40**	**50**	**40**

Year 2017

Station - NIT, Raipur

Month	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)
January	93.96	51.60	20.36	21.80
February	84.63	38.42	30.56	39.61
March	76.81	42.38	31.24	36.92
April	59.65	40.22	18.86	22.74
May	57.44	36.83	12.38	13.58
June	54.81	23.45	8.10	12.82
July	31.91	15.19	8.19	13.06
August	34.22	19.28	8.94	12.50
September	35.96	17.10	12.10	12.70
October	52.88	26.47	19.10	16.80
November	73.89	32.74	20.10	16.65
December	75.74	36.40	25.63	14.14
Average	**60.99**	**31.67**	**17.96**	**19.44**
Standard	**60**	**40**	**50**	**40**

AMBIENT AIR QUALITY MONITORING BY CECB
(NAMP STATIONS)

Year 2018

Station - Regional Office, CECB, Housing Board Complex, Kabir Nagar, Raipur

Month	PM 10 ($\mu g/m^3$)	PM 2.5 (Avg.) ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	86.58	-	-	-
February	80.43	-	13.58	20.91
March	77.55	-	13.25	13.80
April	78.61	-	12.17	14.17
May	62.50	-	11.16	14.33
June	44.20	-	10.18	14.00
July	39.10	-	9.72	15.21
August	37.15	-	9.23	13.66
September	41.56	-	10.59	15.31
October	47.95	-	12.78	19.31
Average	**59.56**	**-**	**11.41**	**15.63**
Standard	**60**		**50**	**40**

Year 2018

Station – CSIDC, Siltara

Month	PM_{10} ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	82.33	21.20	31.92
February	84.12	24.48	34.10
March	79.73	22.32	32.65
April	81.61	23.43	34.82
May	80.27	26.78	39.18
June	78.04	25.66	38.45
July	74.19	24.55	37.73
August	70.69	23.43	36.28
September	71.95	23.43	37.00
October	73.52	24.55	39.18
November	77.47	25.66	40.63
December	79.40	26.32	40.93
Standard	**100**	**80**	**80**

AMBIENT AIR QUALITY MONITORING (CAAQMS)

Year 2018

Station - Collectorate Parisar, Raipur

Month	PM10 (µg/m3)	PM 2.5 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)
January	87.37	40.38	30.29	20.53
February	78.17	35.00	28.28	23.35
March	74.42	36.29	27.28	19.94
April	54.34	29.97	16.03	11.79
May	61.04	37.74	19.11	20.19
June	49.04	26.89	12.85	16.77
July	35.47	18.23	13.03	16.89
August	31.72	19.15	11.10	12.22
September	35.04	16.53	12.01	12.44
October	40.63	23.49	19.02	14.29
Average	**54.72**	**28.36**	**18.90**	**16.84**
Standard	**60**	**40**	**50**	**40**

Year 2018

Station - NIT, Raipur

Month	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)
January	76.90	35.61	24.07	13.45
February	72.77	32.50	25.56	13.40
March	69.70	33.06	22.27	11.76
April	59.31	37.35	20.06	21.76
May	50.73	26.46	13.02	11.44
June	45.86	23.42	9.23	12.10
July	30.79	14.59	08.47	12.80
August	29.93	16.20	07.95	10.39
September	31.70	14.56	10.26	10.80
October	36.62	20.23	16.06	12.35
Average	**50.43**	**25.39**	**15.69**	**13.02**
Standard	**60**	**40**	**50**	**40**

Ambient Air Quality As Per Study of Load Carrying Capacity

As per Study of Load Carrying Capacity in Raipur Region conducted by IIT Bombay during 2016-2017 ambient air quality of in Siltara Industrial Area at different locations is as follows:-

Location	Season	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	AQI
Siltara Industrial Area	Summer	212	12	14	26	175
	Post Monsoon	514	119	19	68	505
	Winter	194	123	34	96	302
Dhaneli	Summer	193	44	21	37	162
	Post Monsoon	401	75	17	54	364
	Winter	431	106	37	111	401
Mohadi	Summer	231	25	22	12	187
	Post Monsoon	175	92	18	19	207
	Winter	220	95	38	50	217

The above study reveals that concentration of PM_{10}, $PM_{2.5}$ and NO_2 are more than as prescribed in National Ambient Air Quality Standards and SO_2 is within standards in Siltara Industrial Cluster. Air Quality of the above area falls under moderately polluted category in summer season, poor to severely polluted in post monsoon season and poor to very poor in winter season.

Therefore, it is necessary to take adequate measures for improvement of ambient air quality of the industrial cluster in integrated manner to meet the National Ambient Air Quality Standards and maintaining Kharun River water quality. Hence, following action plan is being proposed by different implementing agencies.

ACTION PLAN FOR SILTARA INDUSTRIAL CLUSTER

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
VEHICLES	Restriction on plying and phasing out of 15 years old commercial diesel driven vehicles.	Mid	-	Transport Department	1. The Power to fix life of a vehicle lies with Central Government only under section 59 of CMV Act. It is in process of deliberation on a scrapping policy for vehicles. 2. State Government laid down age limit for permit condition for buses (12 years) and trucks (15 years). The CG Motor Vehicle Rule 70A contained provision related to age limit for permit of buses. It is been struck down by Hon'ble High Court of CG in its order in

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
					WPC No. 2004/2017 on 26-07-2018. 3. No permit is being given in urban and rural areas to Autos older than 10 years and 12 years respectively.
	Regular checking of vehicular emission and issue of Pollution under Control Certificate (PUC).	Short	May 2019	Transport Department and Police Department	-
	Periodic calibration test of vehicular emission monitoring instrument.	Short	June 2019	Transport Department	As per MoRTH direction, computerized and networked system of pollution checking has to be introduced from 1st April 2019.
	Good traffic management including redirection of traffic movement to avoid traffic congestion.	Short	June 2019	Transport Department and Police Department	-
	Promotion and operationalization of E-rickshaw.	Short	June 2019	Transport Department and Urban Administration and	-

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
				Development	
	Monitoring on vehicle fitness.	Short	June 2019	Transport Department	-
	Checking of fuel adulteration.	Immediate	Immediate	Food and Civil Supply Department/Oil Companies	-
	Restriction on overloading of vehicles.	Immediate	Immediate	Transport Department	-
ROAD DUST	Regular cleaning of road dust in the industrial cluster.	Short	June 2019	CSIDC/ CGPWD/Urban Administration and Development / NHAI / Panchayat and Rural Development Department	-
	Water spraying on roads through tankers in the industrial cluster.	Short	June 2019	CSIDC/ CGPWD/Urban Administration and Development / NHAI / Panchayat and Rural Development Department	-
	Maintenance of roads in the industrial cluster to avoid dust emission.	Mid	July 2019	CSIDC/ CGPWD/Urban Administration and Development / NHAI / Panchayat and Rural Development Department	-
	Plantation / green belt development in open areas,	Mid	Coming Monsoon	CECB/Concern Government Departments /	-

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	gardens, parks / community places, schools & housing societies of the industrial cluster.			Urban Administration and Development / Industrial Units / Panchayat and Rural Development Department	
	Plantation / green belt development in open areas of Siltara Industrial Area.	Mid	Coming Monsoon	CSIDC / Industrial Units / CECB	-
	Introduction of water fountains at major traffic intersection / circle.	Short	June 2019	Urban Administration and Development / CSIDC / Panchayat and Rural Development Department	-
CONSTRUCTION ACTIVITIES	Covering of construction site.	Short	June 2019	Urban Administration and Development / Town and Country Planning Department / CSIDC	-
	Transportation of construction materials like sand, soil, stone chips etc. in covered system.	Immediate	April 2019	Transport Department and Police Department	-
	Restriction on storage of construction	Short	May 2019	Urban Administration and Development /	-

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	materials along the road.			Town and Country Planning Department / CSIDC / Panchayat and Rural Development Department	
BIOMASS AND GARBAGE BURNING	Restriction on open burning of municipal solid waste, Biomass, plastic horticulture waste etc.	Immediate	Immediate	Urban Administration and Development / CSIDC / Panchayat and Rural Development Department	-
	Transportation of Municipal Solid Wastes, construction materials and debris in covered system.	Immediate	Immediate	Urban Administration and Development / Panchayat and Rural Development Department	-
	Ensuring promotion and use of cleaner fuel for commercial purposes like local dhabas / eateries.	Short	June 2019	District Administration/Oil Companies	-
INDUSTRIES	Ensuring installation and effective operation of pollution control devices, ensuring emission standards in industries and taking stringent	Immediate	Immediate	CECB	-

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	action against violating industries.				
	Control of fugitive dust emission from industries. ➢ Minimizing the height of raw materials / coal / solid wastes drop to the stockpile and ensuring water spray system.	Short	June 2019	CECB / All Industries	
	➢ Use of water spray systems / dust suppression systems / chemical fog systems / rain guns in crusher, screen, raw materials, fuel, solid wastes storage areas & yards and handling / conveying systems.	Short	June 2019	CECB / All Industries	

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	➢ Storage of solid wastes from pollution control systems like bag filter / scrubber in pucca and covered area and ensuring environmentally safe disposal of these wastes through transportation in covered vehicles.	Immediate	April 2019	CECB / All Industries	
	➢ Ensuring transportation of iron ore, sponge iron, coal, fly ash, washed coal / reject coal in covered vehicle.	Immediate	April 2019	CECB / All Industries	
	➢ Ensuring short time storage of solid waste within premises and regular disposal in environmentally safe manner.	Immediate	April 2019	CECB / All Industries	

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	➢ Ensuring properly maintained pucca internal roads. Ensuring regular cleaning of dust and water sprinkling on internal roads.	Short	June 2019	CECB / All Industries	
	➢ Use of mechanized sweeping machine at integrated steel plants, sponge iron plants and power plants.	Mid	August 2019	CECB / All Concerned Industries	
	Increasing the height of all stacks attached to emission sources such as auxiliary process equipment / bag filter / scrubber to minimum 30 meter.	Mid	August 2019	CECB / All Industries	
	Ensuring use of all treated effluent within plant premises and no discharged outside the premises of any effluent. Ensuring no mixing of any treated / untreated	Immediate	April 2019	CECB / All Industries	

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	effluent from industries in any nalla / kharun rivier.				
	Provisions of wind breaking wall, installation of rain gun, wheel washing arrangement, treatment of wash water and arrangement of CCTv cameras at coal / washed coal / reject coal handling and storage areas, entrance and exit gates in all coal washeries.	Mid	August 2019	CECB / All Coal Washeries	
STRENGTHENING AAQ MONITORING	Installation of two CAAQMS in industrial cluster area.	Long	March 2020	CECB / Industrial Units	-
	Installation of two CWQMS in Kharun River.	Long	March 2020	CECB / Industrial Units	-
PUBLIC AWARENESS	Issue of advisory to public for prevention and control of air pollution.	Immediate	March 2019	CECB	-
	Involvement of school and other academic institution in	Short	June 2019	CECB	-

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/ MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
	awareness program.				
OTHERS	Providing web portal for redressal of public complaints.	Immediate	April 2019	CECB	-

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Industrial Cluster Korba

Introduction -

Korba is known as the Land of Black Diamond, Koka Silk and Thermal Power in the State of Chhattisgarh. Korba district has a huge reservoir of coal over 520 sq. km known as Korba Coalfield. Easy availability of coal as raw material has led to establishment of power plants, coal washeries and mines. All these industries are air polluting in nature and behave as point, area and line source of pollution, based on the production process and different activities involved during operation.

Power plant generates particulate matter and gaseous pollutants (such as oxides of sulphur and nitrogen) as the coal contain ash and sulphur. Mining activities including blasting, excavation, handling and transport of excavated coal lead to generation of heavy air pollution. Equipments and vehicles used in the process are a major source of air pollution as these equipments uses fuels and leads to resuspension of dust due to movement on paved and unpaved road within the mines/industry premises as well as on city roads.

Ministry of Environment, Forest & Climate change vide its OM dated 13/01/2010 declared Korba as critically polluted area with CEPI score of 83 and ranked 5th among the critically polluted areas. Korba critically polluted area covers industrial area Korba, area of M/s NTPC Ltd., M/s Balco, M/s CGPGCL (East & West) township and Korbatownship under it. A comprehensive action plan was prepared and submitted to CPCB for reducing the pollution load in the Korba and based on this action plan, the moratorium imposed by MoEF on establishment of new industry was lifted by OM dated 17/09/2013.

Major Industries in Korba –

Thermal power plant and coal mines are the main industries situated in the Korba area. Name of these industries are as given below:

1. M/s NTPC Ltd., Korba Super Thermal Power Station, Jamnipali, Korba.
2. M/s Chhattisgarh State Electricity Board (CSEB), Hasdeo Thermal Power Station, Korba (West), Korba
3. M/s Chhattisgarh State Electricity Board (CSEB),

Korba Thermal Power Station, Korba (East), Korba

4. M/s Chhattisgarh State Electricity Board (CSEB), Dr.Shyama Prasad Mukherjee Thermal Power Station, Korba (East), Korba.
5. M/s Bharat Aluminium Co. Ltd. Balco Nagar, Korba(Aluminium Smelter Plant)
6. M/s Bharat Aluminium Co. Ltd. Balco Nagar, Korba (CPP-2)
7. M/s Bharat Aluminium Co. Ltd. Balco Nagar, Korba (CPP-1) Balco Captive Power Plant, Jamnipali, Korba
8. M/s Gevra Open Cast Mines, SECL, Korba
9. M/s Dipka Open Cast Mines, SECL, Korba
10. M/s Kusmunda Open Cast Mines, SECL, Korba
11. M/s Manikpur Open Cast Mines, SECL, Korba
12. M/s ACB India Limited, Dipka Coal Washery, Dipka, Korba
13. M/s ACB India Limited, Gevra Coal Washery, Gevra, Korba
14. M/s Indo Sponge Power & Steel private Ltd (Sponge Iron Plant)

Industrial area Rajgamar is situated about 06 km away from Korba town. All the roads in this industrial area are pakka. 94 industries have been allotted land in this industrial area. These are mainly small scale industries.

The map showing location of major industries is annexed.

Hasdeo River –

The Hasdeo basin covers the area of the following districts viz. Koriya, Sarguja, Korba and Janjgir- Champa. The Hasdeo watershed submergs into river Mahanadi which forms a large basin area. Hasdeo River is a tributary of Mahanadi flows in the stretch of 330 km from Hasdeo Mountain at an elevation of 1052 msl about 9.5 kms north of Sonhat village in Koriya district. This prominent chain of hills of Chhotanagpur plateau in the east joins the hills of Maikal range between Khodri and Khongsara. This chain forms a semi circle to the north Mahanadi between the central ridges in Sarguja, Koriya, Korba district and Southern ridges in Bilaspur and Janjgir-Champa district. Hasdeo river flows towards the south and central part of Koriya district at 23°N after flowing 29kms. It receives the Gejriver on the left bank and in downstream it crosses the ranges of hills along Dhajag hill to meet the river Chornai. The Tan and Ahiran rivers are other hilly streams which join it on the right bank, Katghora and Chhuri are located on the left bank

of the river Ahiran.Korba, Champa, Bamhani and Dilli are located on the left bank of the river Hasdeo. It joins the Mahanadi at Mauhadih, twelve kms away from Sheorinarayan.

CEPI study

IIT Kharagpur had conducted Comprehensive Environmental Pollution Index (CEPI) study of Korba region and found that the position of Korba in 2010 among various Critical Polluted Areas was ranked as 5 having a CEPI score of 83.00 evaluated with unrevised algorithm. Also the CEPI evaluated for Korba in the year 2015 was evaluated to be 74.5. With this value of 74.5 in 2015, the Korba stood a rank of 27 corresponding to Report on Comprehensive Environmental Assessment of Industrial Clusters, 2010.

Currently evaluated CEPI (2017) for Korba has the score of 70.08 and 64.40, whose calculations are done on the basis of revised CEPI-2016 concept of CPCB. With these score of CEPI, Korba would stood a rank of 44 corresponding rank list reported in Report on Comprehensive Environmental Assessment of Industrial Cluster, 2010 considering maximum CEPI of 70.08 during December to February.

It can be concluded that the condition of Korba has improved as a critically polluted area, consideringdecreasing trend of CEPI score of Korbain the years 2009, 2015 and 2017.

Load Carrying Capacity Study –

Indian Institute of Technology Mumbai had conducted load carrying capacity study of Korba region and submitted report in November, 2018. Key findings of this study are as given below –

- Area under mining activities has increased by fivefold in last past 25 years while overburden and ash dyke area has been increased by 15.62%
- Following table shows total pollutant emission and contribution from different sources such as point, line, and area (kg/day)

Source	PM10	PM 2.5	NO_x	SO_x	CO
Point Sources	110167	*	1957706	1000750	28908
Area Sources	139264	15256	3357	108	155083
Line Sources	2230	1045	8075	*	8932
Total	251661	16301	1969138	1000858	192923

- In case of PM10 emission, area sources (55.34%) were major contributor followed by point source (43.78%) and line sources (0.89%)
- In case of PM2.5 emission, again area sources (93.59%) were the major contributor and was followed by line sources (6.41%)
- Power plants were major point sources of air pollution while coal mines were major area sources of air pollution in the study area
- Coal and firewood burning for domestic purposes was another major area source of air pollution in the study area
- Multi axle vehicles, mini buses, multi utility vehicles, medium goods vehicles and light goods vehicles were major line sources of air pollution in the study area
- PM10 and PM2.5 concentration at almost all monitoring location was exceeding the standard prescribed by CPCB (24 hours average)
- Air Quality Index (AQI) of the study area varied between moderate and poor.
- Wastewater modelling suggests that overall quality of the HasdeoRiver was relatively good; however, continuous discharge of untreated domestic wastewater (sewage) may deteriorate the water quality over the period.

Need of action plan

Improvement of water quality ofHasdeo River

As per 2011 census, population of Korba city is 3, 65,073. In Korba, the drinking water is being supplied to the citizens by taking water from following:-

1. Surface water source of Hasdeo river (38 MLD)
2. Ground water source through tube wells (3 MLD).

Korba Municipal Corporation supplies about 41 MLD of water to the city through piped distribution network. The Corporation is also constructing one more WTP of 29 MLD. The total capacity will then be 70 MLD. The present gross per capita water supply is 112 lt / day. The addition of capacity will make it possible to supply at national norms of 135 lpcd.

Sewage Generation

The Korba City do not have piped sewage collection system nor does it have the sewage treatment plant. The effluent from the septic

tanks of individual household OR of colonies flow into the natural nallas. There are 3 main nallas in the city which join the Hasdeo River.They are as follows:-

- Durpanalla
- Dengurnalla
- Belgarinalla

The flows of the three nallas were measured hourly over one complete day in the month of August 2016 during monsoon. The observed flows were 23.83, 76.8 and 15.43 MLD respectively.

Apart from above nallas, other ones which were found by Korba Municipal Corporation are:-

- Kosavadinalla
- Railway nalla
- Nalla coming from industrial area at Manikpur and joining Kosavadinalla
- SitamaniNalla which is the confluence of Kosavadinalla, a nalla coming from industrial area to Manikpur and Railway nalla.
- Gervanalla
- Nalla near S.P. Mukarjee power plant
- Rampurnalla

Consequently, the nalla flows at hourly interval for one complete day were measured from 6th April to 12th April 2017. The flows observed are as below –

S.N.	Name of nalla	Location of measurement	Date of measurement	Quantity of water (MLD)
1.	Durpanalla			Dry. Small qty used by farmer.
2.	Dengurnalla	22°22'42.49"N 82°42'46.41"E	8th April 2017	81.08
3.	Belgarinalla	22°24'0.06"N 82°43'29.32"E	9th April 2017	23.03
4.	Kosavadinalla	22°20'13.50"N 82°43'24.54"E	11th April 2017	10.86

5.	Nalla coming from industrial area to Manikpur			Dry. There is only stagnant pool of water
6.	Sitamaninalla	22°19'37.35"N 82°42'35.41"E	7th April 2017	9.28
7.	Rampur nalla	22°22'36.03"N 82°44'25.51"E		dry
8.	Railway nalla	22°20'40.11"N 82°42'24.85"E		4.26
9.	Gervanalla	22°22'3.01"N 82°41'42.13"E		5.38
10.	Nalla near S.P. Mukherjee TPS			dry

. The system shall be planned for 35 MLD for STP and TTP. 20 MLD of treated effluent will be reused. However, pumping stationand the pipelines up to STP are planned for 39 MLD considering the likely increase in the population in next 30 years. The proposed STP of 35 MLD capacity will be constructed on the land near Korba Water Treatment Plant at village Kohadia. The plot will also house the proposed Tertiary Treatment Plant and pumping station for transferring the tertiary treated sewage water to NTPC. The above issue has already been taken into consideration in the action plan prepared for "Polluted River Streches".

Improvement of Ambient Air quality

Major Sources of Air Pollution:-

Major sources responsible for degradation in ambient air quality are industrial air pollution, vehicular emission, road dust/re-suspension of dust and other fugitive emission, air pollution from construction and demolition activities, burning of municipal solid waste and plastic waste etc. Number of vehicles plying on roads have also increased manifold. It has been recognized that Korba is facing environmental pollution problems, mainly air pollution caused by number of air polluting industries viz. thermal power plant, coal mines etc. The problem is further aggravated due to increased vehicular movement, bad condition

of roads, poorly maintained vehicles, and increased construction activities.

Ambient Air Quality of the Area -

Ambient Air Quality of the area monitored by Chhattisgarh Environment Conservation Board (CECB) under NAMP and data are as follows:-

Near Tehsil Office, Rampur, Korba

Month (2016)	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	-	12.81	20.44
February	-	12.85	20.20
March	-	12.83	20.38
April	-	12.88	20.78
May	-	12.79	20.35
June	-	12.64	20.30
July	-	11.76	18.36
August	-	10.75	17.17
September	-	11.30	18.59
October	-	11.90	19.17
November	-	12.40	19.63
December	-	12.32	19.75
Annual Avg.		**12.27**	**19.59**
Standards/Limits	**60**	**50**	**40**

Pragati Nagar, Jamanipali, Korba

Month (2016)	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	57.81	11.33	18.75
February	57.20	11.59	19.31
March	85.31	11.45	18.95
April	60.26	11.96	19.00
May	62.93	11.49	18.88
June	58.05	11.53	18.81
July	47.70	10.84	17.50
August	41.16	9.90	15.91
September	49.50	10.53	17.59
October	62.46	10.87	18.55
November	59.66	11.46	19.40

December	59.60	11.92	19.13
Annual Avg.	**58.47**	**11.24**	**18.48**
Standards/Limits	**60**	**50**	**40**

Near Tehsil Office, Rampur, Korba

Month (2017)	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	-	12.90	20.56
February	-	12.76	20.05
March	86.00	12.23	19.87
April	68.89	12.27	20.15
May	67.35	12.43	20.20
June	65.16	11.54	18.12
July	45.3	10.86	17.54
August	56.3	11.16	18.07
September	55.00	10.69	18.20
October	58.35	12.66	20.54
November	61.05	11.27	20.80
December	63.26	11.64	21.33
Annual Avg.	**62.67**	**11.87**	**19.62**
Standards/Limits	**60**	**50**	**40**

Pragati Nagar, Jamanipali, Korba

Month (2017)	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	77.60	12.00	19.84
February	70.66	11.63	19.45
March	56.05	11.57	18.80
April	67.50	11.45	18.65
May	53.41	11.80	18.57
June	48.33	10.87	17.77
July	35.62	9.32	15.80
August	42.30	9.91	16.87
September	43.40	9.58	16.97
October	47.50	10.27	18.03
November	53.25	9.91	19.45
December	50.29	9.32	18.46
Annual Avg.	**53.83**	**10.64**	**18.22**
Standards/Limits	**60**	**50**	**40**

Near Tehsil Office, Rampur, Korba

Month (2018)	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	69.08	11.71	21.08
February	70.45	10.67	20.61
March	69.64	10.77	20.73

April	71.9	11.52	20.97
May	74.68	10.95	21.02
June	54.72	10.21	20.36
July	49.31	8.53	16.73
August	52.25	8.41	19.06
September	52.67	9.35	17.88
October	53.63	9.87	19.74
Annual Avg.	**61.83**	**10.2**	**19.82**
Standards/Limits	**60**	**50**	**40**

Pragati Nagar, Jamanipali, Korba

Month (2018)	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	56.34	9.93	19.79
February	55.40	9.70	19.48
March	55.40	9.50	19.51
April	57.80	9.25	19.36
May	59.52	9.17	19.31
June	54.38	9.01	19.07
July	38.37	7.56	16.10
August	41.77	7.35	15.08
September	44.10	8.17	17.09
October	47.81	8.80	18.88
Annual Avg.	**51.09**	**8.84**	**18.37**
Standards/Limits	**60**	**50**	**40**

The above study reveals that concentration of PM_{10} are more than as prescribed in National Ambient Air Quality Standards and SO_2& NO_2 are within standards in Korba Industrial Cluster.

Considering the above mentioned facts, the action plan for Korba industrial cluster is prepared as Annexed.

Action Plan for Korba Industrial Cluster

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
VEHICLES	Restriction on plying and phasing out of 15 years old commercial diesel driven vehicles.	MID	-	Transport Department	1. The Power to fix life of a vehicle lies with Central Government only under section 59 of CMV Act. It is in process of deliberation on a scrapping policy for vehicles. 2. State Government laid down age limit for permit condition for buses (12 years) and trucks (15 years). The CG Motor Vehicle Rule 70A contained provision related to age limit for permit of buses. It is been struck down by Hon'ble High Court of CG in its order in WPC No. 2004/2017 on 26-07-2018. 3. No permit is being given in urban and rural areas to Autos older than 10 years and 12 years respectively.
	Regular checking of vehicular emission and issue of Pollution under Control Certificate (PUC).	SHORT	May2019	Transport Department and Police Department	-
	Periodic calibration test of vehicular emission monitoring instrument.	SHORT	June2019	Transport Department	As per MoRTH direction, computerized and networked system of pollution checking has to be introduced from 1st April 2019.
	Good traffic management including	SHORT	June 2019	Transport Department and Police	-

	redirection of traffic movement to avoid traffic congestion.			Department	
	Promotion and operationalization of E-rickshaw.	SHORT	June 2019	Transport Department and Urban Administration and Development	-
	Monitoring on vehicle fitness.	SHORT	June 2019	Transport Department	-
	Checking of fuel adulteration.	IMMEDIATE	IMMEDIATE	Food and Civil Supply Department/Oil Companies	-
	Restriction on overloading of vehicles.	IMMEDIATE	IMMEDIATE	Transport Department	-
ROAD DUST	Regular cleaning of road dust.	SHORT	June 2019	CGPWD/Urban Administration and Development / NHAI / Panchayat and Rural Development Department	-
	Water spraying on roads through tankers.	SHORT	June 2019	CGPWD/Urban Administration and Development / NHAI / Panchayat and Rural Development Department	-
	Maintenance of roads to avoid dust emission.	SHORT	June 2019	CGPWD/Urban Administration and Development / NHAI / Panchayat and Rural Development Department	-

INDUSTRIES	a. CSPGCL, Korba (East) Up-gradation of air pollution control equipments to bring emission to 50 mg/NM^3.	LONG TERM	December 2020	CSPGCL, Korba (East)	
	b. CSPGCL, Korba (West) Up-gradation of air pollution control equipments to bring emission to 50 mg/NM^3.	LONG TERM	December 2020	CSPGCL, Korba (WEST)	-
	c. Control of fugitive emission in Gevra Open Cast Mine				
	• use of mechanized sweeping machine	SHORT TERM	June 2019	SECL, Gevra	
	• use of long range fogging machine	SHORT TERM	June 2019	SECL, Gevra	
	• Installation of Inpit conveying system	SHORT TERM	March 2019	SECL, Gevra	
	• Loading of coal through Junadih siding	SHORT TERM	April 2019	SECL, Gevra	
	• Coal loading through silo	SHORT TERM	April 2019	SECL, Gevra	
	• Plantation in available area (52000 Nos. Approx)	MID TERM	October 2019	SECL, Gevra	
	d. Control of fugitive emission in Dipka Open Cast Mine				
	• use of mechanized sweeping machine	MID TERM	June 2019	SECL, Dipka	
	• use of long	MID TERM	June 2019	SECL, Dipka	

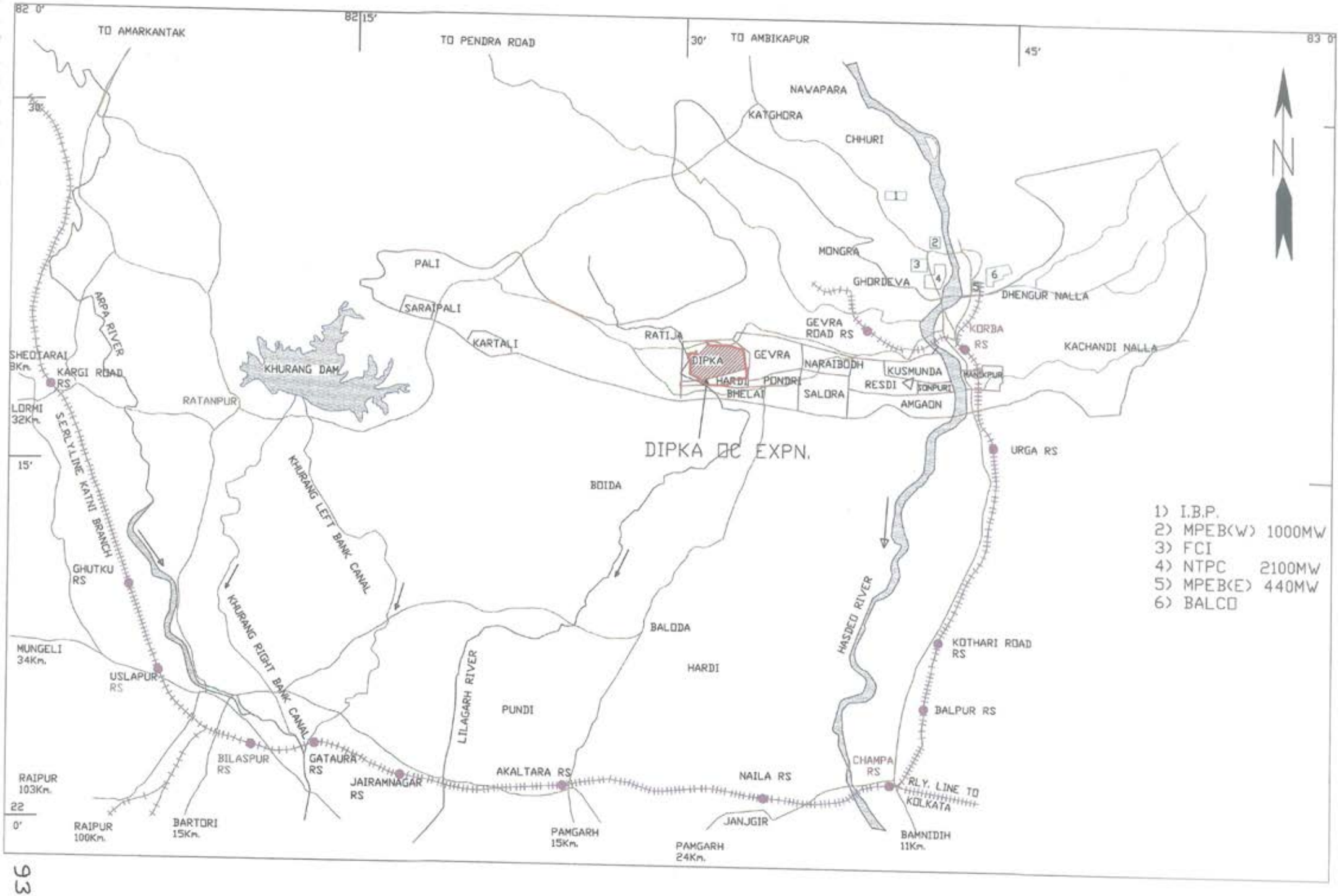
	range fogging machine	Already in operation	-	SECL, Dipka	-
	• Installation of Inpit conveying system	MID TERM	October 2019	SECL, Dipka	
	• Installation of wind shield on Railway siding	Already in operation	-	SECL, Dipka	-
	• Coal transportation through Silo	MID TERM	October 2019	SECL, Dipka	
	• Plantation in available area (83000 Nos. Approx.)				
	e. Control of fugitive emission in Kusmunda Open Cast Mine				
	• use of mechanized sweeping machine	Already in operation		SECL, Kusmunda	
	• use of long range fogging machine	SHORT TERM	April 2019	SECL, Kusmunda	-
	• Construction of four number SILO with rapid loading system along with new railway siding	LONG TERM	December 2021	SECL, Kusmunda	-
	• Installation of Inpit conveying system	LONG TERM	December 2023	SECL, Kusmunda	-
	• Plantation in available area (70000 Nos. Approx)	MID TERM	October 2019	SECL, Kusmunda	-
	f. Control of fugitive emission in Manikpur Open Cast Mine				
	• Use of mechanized sweeping	LONG TERM	December 2021	SECL, Manikpur	-

	machine				
	• use of long range fogging machine	LONG TERM	December 2021	SECL, Manikpur	-
	• Installation of Inpit conveying system	LONG TERM	December 2022	SECL, Manikpur	-
	• Plantation in available area (35000 Nos. Approx)	MID TERM	October 2019	SECL, Manikpur	-
	g. Maintenance of haul roads for transportation	REGULAR	-	All Coal Mines	-
	h. Construction of wind breaking arrangement, installation of rain gun, installation of wheel washing facility and provision of CCTV camera at entrance and exit.	MID TERM	December 2019	Coal Washeries	-
	i. Maintenance of existing ash dykes to prevent spreading of ash in nearby areas by keeping dyke wet, by covering it with soil etc.	IMMEDIATE	IMMEDIATE	Concerned Thermal Power Plants	-
	j. Complete utilisation of fly ash generated from power plants as per provisions of fly ash notification,	LONG TERM	March 2022	Concerned Thermal Power Plants	-

	2009.				
	k. Ensuring operation of air pollution control devices in industries and taking action against violators.	IMMEDIATE	IMMEDIATE	CECB	-
	l. Transportation of fly ash, coal / washed coal in covered vehicle to prevent fugitive emission.	IMMEDIATE	IMMEDIATE	All Thermal Power Plant / Coal Mines / coal washery	
	m. Provisions of wind breaking wall, installation of rain gun, wheel washing arrangement, treatment of wash water and arrangement of CCTV camera in all coal washeries.	MID TERM	October 2019	All coal washeries	
BIOMASS AND GARBAGE BURNING	Ensuring Promotion and use of cleaner fuel for domestic and commercial purposes.	MID	December 2019	District Administration/ Oil Companies	-

STRENGTHENING OF MONITORING NETWORK	a) Three NAMP stations are operational in Korba area and 02 CAAQMS are operational at Indira complex, Jamnipali and Balcoparisar, Balconagar by M/s NTPC and BALCO respectively. Similarly, Three CAAQMS are operational in Near C.G.M office in Gevra OCM, Near project office in Kusmunda OCM and near labour chowk in Dipka OCM respectively operated by respective coal mines.	-	-	-	Additional monitoring station is not required.
	b) Installation of CWQMS at two locations in Hasdeo River.	LONG TERM	MARCH 2020	CECB / Concerned Industries	
PLANTATION	Tree plantation in the available area of premises / along road side.	MID TERM	October 2019	All industries / PWD / NHAI / UAD	-
PUBLIC AWARENESS	Issue of advisory to public for prevention and control of air pollution.	Short	March 2019	CECB	-

	Involvement of school and other academic institution in awareness program.	Short	June 2019	CECB	-
OTHERS	Providing web portal for redressal of public complaints.	Short	April 2019	CECB	-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PALI
SARAIPALI
KARTALI
RATIJA
GEVRA ROAD RS
KORBA RS
DIPKA
GEVRA
NARAIBODH
KUSMUNDA
HARDI
PONDRI
RESDI
SONPURI
BHELAI
SALORA
AMGAON
MANIKPUR
DIPKA OC EXPN.
URGA RS
SHEORARAI 8Km.
KARGI ROAD RS
LORMI 32Km.
ARPA RIVER
KHURANG DAM
RATANPUR
SERLYLINE KATNI BRANCH
KHURANG LEFT BANK CANAL
KHURANG RIGHT BANK CANAL
BOIDA
BALODA
HARDI
PUNDI
LILAGARH RIVER
HASDEO RIVER
GHUTKU RS
MUNGELI 34Km.
USLAPUR RS
BILASPUR RS
GATAURA RS
JAIRAMNAGAR RS
AKALTARA RS
NAILA RS
CHAMPA RS
KOTHARI ROAD RS
BALPUR RS
RLY. LINE TO KOLKATA
RAIPUR 103Km.
RAIPUR 100Km.
BARTORI 15Km.
PAMGARH 15Km.
PAMGARH 24Km.
JANJGIR
BAMNIDIH 11Km.
1) I.B.P.
2) MPEB(W) 1000MW
3) FCI
4) NTPC 2100MW
5) MPEB(E) 440MW
6) BALCO
N

Industrial Cluster Bhilai

Introduction

Bhilai is a city of District of Durg which falls in the Eastern Central India. It is about 22 kilometres west to Raipur the capital of Chhattisgarh on the main Howrah–Mumbai rail line and National Highway no. 53. It is spread over an area of about 269.45 square kilometres.

The history of Bhilai city is inevitably linked to the history of the Bhilai Steel Plant. The Steel Plant was established during India's Second Five-Year Plan (1956–61) with the assistance of the Russian Government. The main aim of setting up this plant was to provide employment opportunities to the rural population.

Bhilai Nagar Nigam came into existence on 8th June 1998. It has played an important role in the development of this city. The city has been divided into 70 wards, are under the purview of Bhilai Nagar Nigam and Bhilai Steel plant. For the purpose of administrative convenience, Bhilai city has been divided into 6 zones.

Brief Industrial Profile of Bhilai

Bhilai is known for Bhilai Steel Plant(BSP) which is the largest production unit of SAIL. Most of the industries in Bhilai area are metallurgical industries.Due to influence of BSP the entire area has become a metallurgical hub during the last 50 years. The large scale industries located in Bhilai Region, are as below:-

S.No.	Name of Industry	Category of Industry	Sector
1.	M/s Bhilai Steel Plant, Bhilai Distt. Durg	Red	Integrated Iron and Steel Plant
2.	M/s NSPCL (2 x 250 MW), Village- Purena, Bhilai, Distt. Durg.	Red	Thermal Power Plant
3.	M/s Bhilai J.P. Cement, Bhilai Steel Plant Premises, Bhilai, Distt. Durg.	Red	Cement Grinding Unit
4.	M/s Bhilai Refractories Plant, Maroda, Bhilai, Distt. Durg.	Red	Fire Bricks / Refractory Materials
5.	M/s A.C.C. Ltd., Jamul Cement Works, Bhilai, Distt. Durg.	Red	Cement Plant

Apart from above, there are 04industrial areas located in Bhilai region. Details about them are mentioned below:-

1. Industrial Estate, Bhilai (Total area - 221.52 acre)

S.No.	Name of Industrial Sector	Categoryof Industry	No.of Industries
1.	Steel forging units	Orange	04
2.	Steel casting units	Orange	01
3.	Paint units	Red	01
4.	Naphtha plant/Coal tar processing units	Red	01
5.	Ferro alloys units	Orange	03
6.	H.B. Wire/M.S. Wire/G.I. Wire units	Orange/Red	05
7.	Oxygen/ Nitrogen gas units	Green	02
8.	Rolling mill unit	Orange	01
9.	Empty drums washing unit	Orange	01
10.	Aerometric chemicals unit	Red	01
11.	Fabrication unit	Green	02
12.	Drinking water unit	Green	01
13.	PCC pole unit	Green	01
14.	Plastic granules unit	Green	01
15.	Non ferrous	Orange	01

2. Light Industrial area, Bhilai (Total area - 716.14 acre)

S.No.	Name of Industrial Sector	Category of Industry	No. of Industries
1.	Casting units	Orange	03
2.	Naphthalene plant/coal tar processing units	Red	13
3.	Ferro alloys units	Orange	04
4.	Paints unit	Red	01
5.	H.B. Wire/ M.S. Wire/ G.I. Wire units	Orange /Red	50
6.	Ingot pipe manufacturing unit	Orange	02
7.	Rock/slag wool units	Orange	02
8.	Aluminium welding rod manufacturer	Orange	01
9.	Battery waste processing units	Red	01
10.	Rolling mill	Orange	09
11.	Auto Mobile	Orange	01
12.	Scrap processing	Red	01
13.	Soap detergent	Orange	05
14.	Slag wool of pig iron	Orange	02
15.	Rubber comb and granules form	Green	01
16.	Fabrication	Green	01
17.	Technical equipment	Green	01
18.	Engineering works hydraulic	Orange	01

	cylinder		
19.	Plastic unit	Green	03
20.	Namkeen chips	Green	01
21.	Aqua jerking	Green	01
22.	Hog pipe septic tank	Green	01
23.	CBMWTF	Red	01

3. Heavy Industrial area, Hathkhoj,Bhilai (Total area - 823.54 acre)

S.No.	Name of Industrial Sector	Category of Industry	No. of Industries
1.	Sponge Iron plant	Red	01
2.	Steel forging/casting units	Orange	06
3.	Microwave tower units	Orange	01
4.	Naphtha plant/Coal tar processing units	Red	09
5.	Ferro alloys units	Orange	04
6.	H.B. Wire/M.S. Wire/G.I. Wire units	Orange/Red	34
7.	Rolling mill	Orange	04
8.	Fabrication	Green	05
9.	Scrap	Orange	01
10.	Stone Grinding and crushing unit	Orange	02
11.	Fire clay	Orange	06
12.	CO2 gas unit	Green	01
13.	O2 gas unit	Green	01
14.	Bio fertilizer units	Green	01
15.	PPC pole unit	Green	01
16.	Thermo plastic unit	Green	01
17.	Rock/slag wool units	Orange	02
18.	Aluminium ingot	Orange	01

4. Engineering Park , Hathkhoj, Bhilai (Total area - 300.39 acre)

S.No.	Name of Industrial Sector	Category of Industry	No. of Industries
1.	H.B. Wire/ M.S. Wire/G.I. Wire units	Orange/Red	02
2.	Non ferrous zinc coated wire	Orange	01
3.	Aluminium extraction door, window, frame, aluminium powder, flax, nut bolt	Orange	03
4.	Rubber comb and granules	Green	01
5.	Pat bottle flux	Green	01
6.	PVC pipe, hoj fitting	Green	02
7.	Manganese oxide	Red	01
8.	Liquid gas oxygen	Green	01
9.	Steel tube of stainless steel	Green	01

Water Pollution in Industrial Cluster

There is no major nala or river flowing nearby Bhilai Industrial Cluster. Bhilai Steel Plant is recycling major portion of its effluent back in to the process / plantation. Industry has submittedan action plan for developing recycling system for effluent which ispresently discharged from outlet B and C. Bhilai Steel Plant has installed Sewage Treatment Plant (STP) for the treatment of domestic effluent generated from the township area. Other industries in this industrial cluster are not water intensive. The respective industries have provided effluent treatment system within their premises.Treated effluent is being used in process, cooling, horticulture etc. No effluent is discharged outside the premises.

Need of action plan for Improvement of Ambient Air quality

Major Sources of Air Pollution

Major sources responsible for degradation in ambient air quality are industrial air pollution, vehicular emission, road dust/re-suspension of dust and other fugitive emission, air pollution from construction and demolition activities, burning of municipal solid waste and plastic waste etc. Number of vehicles plying on roads have also increased manifold. It has been recognized that Bhilai is facing environmental pollution problems, mainly air pollution caused by number of air polluting industries. The problem is further aggravated due to increased vehicular movement, bad condition of roads, poorly maintained vehicles, and increased construction activities.

Ambient Air Quality of the Area

Ambient Air Quality of the area monitored by Chhattisgarh Environment Conservation Board (CECB) under NAMP and data are as follows:-

REPORT OF NAMP STATIONS - YEAR2016

1. Regional Office, 5/32 Bunglow, Bhilai

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	76.70	5.48	15.41
February	77.05	5.84	16.30

March	75.32	5.27	14.73
April	71.36	5.58	14.85
May	71.19	5.46	14.62
June	76.85	5.60	15.00
July	62.69	5.29	14.71
August	67.14	5.50	14.06
September	69.17	4.90	14.33
October	72.11	5.05	15.20
November	74.38	5.33	15.38
December	74.97	5.57	15.54
Annual Avg.	**72.41**	**5.41**	**15.01**
Standard	**60**	**50**	**40**

2. Vishak Hostel, Bhilai

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	97.29	10.48	22.38
February	95.68	9.98	22.45
March	96.28	9.52	21.64
April	95.81	10.26	21.34
May	93.70	9.70	21.12
June	91.75	9.75	21.42
July	91.33	9.69	21.59
August	84.41	8.69	19.78
September	85.59	9.71	20.79
October	87.68	8.70	21.28
November	93.57	9.55	21.66
December	94.01	9.88	22.00
Annual Avg.	**92.26**	**9.66**	**21.45**
Standard	**60**	**50**	**40**

3. Laghu Udyog Nigam (I.A.) Bhilai

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	173.25	11.63	31.08
February	173.21	11.50	31.93
March	170.87	11.22	31.08
April	168.50	11.29	31.71
May	159.83	11.00	31.63
June	154.87	10.76	30.38
July	157.31	10.59	30.59
August	152.30	10.69	30.69
September	152.94	10.79	30.68
October	158.66	10.97	30.87
November	164.78	11.14	30.88
December	167.49	11.41	31.79
Annual Avg.	**162.83**	**11.08**	**31.11**
Standard	**60**	**50**	**40**

REPORT OF NAMP STATIONS - YEAR2017

1. Regional Office, 5/32 Bunglow, Bhilai

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	77.03	5.62	15.86
February	77.03	5.76	16.09
March	72.74	5.43	15.16
April	71.56	5.48	15.81
May	71.33	5.50	14.43
June	71.53	5.55	15.07
July	65.57	5.53	14.41
August	64.13	5.38	14.05
September	64.36	5.19	14.81
October	64.04	4.23	14.38
November	62.83	4.39	14.56
December	70.32	5.33	14.65
Annual Avg.	**69.37**	**5.28**	**14.94**
Standard	**60**	**50**	**40**

2. Hostel, Bhilai

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	95.66	10.24	22.26
February	96.82	10.11	23.08
March	94.97	9.58	21.63
April	90.76	9.75	21.33
May	92.28	9.54	21.10
June	90.98	9.76	21.43
July	86.88	9.82	21.54
August	85.72	9.31	20.46
September	86.59	9.53	21.00
October	83.88	8.50	18.83
November	82.23	7.38	18.04
December	82.27	7.76	18.20
Annual Avg.	**89.09**	**9.27**	**20.74**
Standard	**60**	**50**	**40**

3. Laghu Udyog Nigam (I.A.) Bhilai

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	169.78	11.56	31.38
February	172.66	11.38	31.66
March	156.11	11.16	31.16
April	153.73	11.29	29.55

May	156.73	10.97	30.53
June	153.28	10.71	30.18
July	135.76	10.03	29.19
August	102.81	10.71	30.56
September	100.04	10.73	30.95
October	128.67	10.95	28.67
November	117.71	9.56	28.33
December	102.16	10.02	25.24
Annual Avg.	**137.45**	**10.76**	**29.78**
Standard	**60**	**50**	**40**

REPORT OF NAMP STATIONS - YEAR2018

1. Regional Office, 5/32 Bunglow, Bhilai

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	70.77	5.26	14.33
February	67.58	4.77	13.71
March	63.07	4.39	13.28
April	60.09	3.94	12.07
May	58.50	3.59	10.74
June	55.97	3.35	11.09
July	57.88	3.33	10.59
August	52.50	3.18	10.04
September	56.31	3.38	10.24
October	59.8	3.9	10.3
Annual Avg.	**60.25**	**3.91**	**11.64**
Standard	**60**	**50**	**40**

2. Bokaro Hostel, Bhilai

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	88.43	8.56	18.88
February	82.08	8.54	18.67
March	81.80	8.43	18.69
April	79.07	9.33	18.54
May	80.09	9.41	18.15
June	71.55	9.70	18.00
July	79.08	10.11	18.28
August	79.09	9.73	17.64
September	80.69	9.86	17.97
October	83.8	10.1	17.9
Annual Avg.	**80.57**	**9.38**	**18.27**
Standard	**60**	**50**	**40**

3. Laghu Udyog Nigam (I.A.) Bhilai

Month	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)
January	101.08	10.35	24.80

February	99.56	9.96	24.35
March	100.68	9.70	24.30
April	98.29	9.88	22.27
May	97.33	10.33	21.24
June	92.81	9.96	20.93
July	97.07	10.26	21.66
August	91.14	9.64	20.68
September	96.25	10.33	21.48
October	98.00	10.1	21.6
Annual Avg.	**97.22**	**10.05**	**22.33**
Standard	**60**	**50**	**40**

The above study reveals that concentration of PM_{10} are more than as prescribed in National Ambient Air Quality Standards and SO_2& NO_2 are within standards in Bhilai Industrial Cluster.

Considering the above mentioned facts, the action plan for Bhilai industrial cluster is prepared as Annexed.

Action Plan for Bhilai Industrial Cluster

SOURCE GROUP	ACTION	IMPLEMENTATION PERIOD (SHORT/MID/LONG TERM)	TIME TARGET FOR IMPLEMENTATION	RESPONSIBLE AGENCY	REMARK
VEHICLES	Restriction on plying and phasing out of 15 years old commercial diesel driven vehicles.	LONG	-	Transport Department	1. The Power to fix life of a vehicle lies with Central Government only under section 59 of CMV Act. It is in process of deliberation on a scrapping policy for vehicles. 2. State Government laid down age limit for permit condition for buses (12 years) and trucks (15 years). The CG Motor Vehicle Rule 70A contained provision related to age limit for permit of buses. It is been struck down by Hon'ble High Court of CG in its order in WPC No. 2004/2017 on 26-07-2018. 3. No permit is being given in urban and rural areas to Autos older than 10 years and 12 years respectively.
	Regular checking of vehicular emission and issue of Pollution	SHORT TERM	May 2019	Transport Department and Police Department	-

	under Control Certificate (PUC).				
	Periodic calibration test of vehicular emission monitoring instrument.	SHORT TERM	June 2019	Transport Department	As per MoRTH direction, computerized and networked system of pollution checking has to be introduced from 1st April 2019.
	Good traffic management including redirection of traffic movement to avoid traffic congestion.	SHORT TERM	June 2019	Transport Department and Police Department	-
	Promotion and operationalization of E-rickshaw.	SHORT TERM	June 2019	Transport Department and Urban Administration and Development	-
	Monitoring on vehicle fitness.	SHORT TERM	June 2019	Transport Department	-
	Checking of fuel adulteration.	IMMEDIATE	IMMEDIATE	Food and Civil Supply Department/Oil Companies	-
	Restriction on overloading of vehicles.	IMMEDIATE	IMMEDIATE	Transport Department	-
ROAD DUST	Regular cleaning of road dust.	SHORT TERM	June 2019	CSIDC / Nagar Nigam Bhilai	-
	Water spraying on roads through tankers.	SHORT TERM	June 2019	CSIDC / Nagar Nigam Bhilai	-
	Maintenance of roads to avoid dust emission.	SHORT TERM	June 2019	CSIDC / Nagar Nigam Bhilai	-
CONSTRUCTION ACTIVITIES	Covering of construction site.	SHORT TERM	June 2019	Urban Administration and Development / Town and Country Planning/ CSIDC	

	Transportation of construction materials like sand, soil, stone chips etc. in covered system.	SHORT TERM	April 2019	Transport Department and Police Department	
	Restriction on storage of construction materials along the road in industrial area.	SHORT TERM	May 2019	Urban Administration and Development / Town and Country Planning Department / CSIDC	
	M/s Bhilai Steel Plant, Bhilai, Distt. Durg (C.G.)				
	• Installation of ESPs as replacement of Multi-cyclones for all 4nos. of Sinter Machines of SP-II to keep the stack emissions below 50mg/Nm3	LONG TERM	30.11.2019	Bhilai Steel Plant	
	• Up-gradation of waste gas ESP of SP-III to keep the stack emissions below 50mg/Nm3	LONG TERM	30.11.2019	Bhilai Steel Plant	
	• Cast house de-fuming system of BF-7 to improve the cast house work zone environment	LONG TERM	30.11.2019	Bhilai Steel Plant	
	• Installation of bag filters in RMP-2	LONG TERM	30.11.2019	Bhilai Steel Plant	
	• Installation of Secondary	LONG TERM	July 2022	Bhilai Steel Plant	

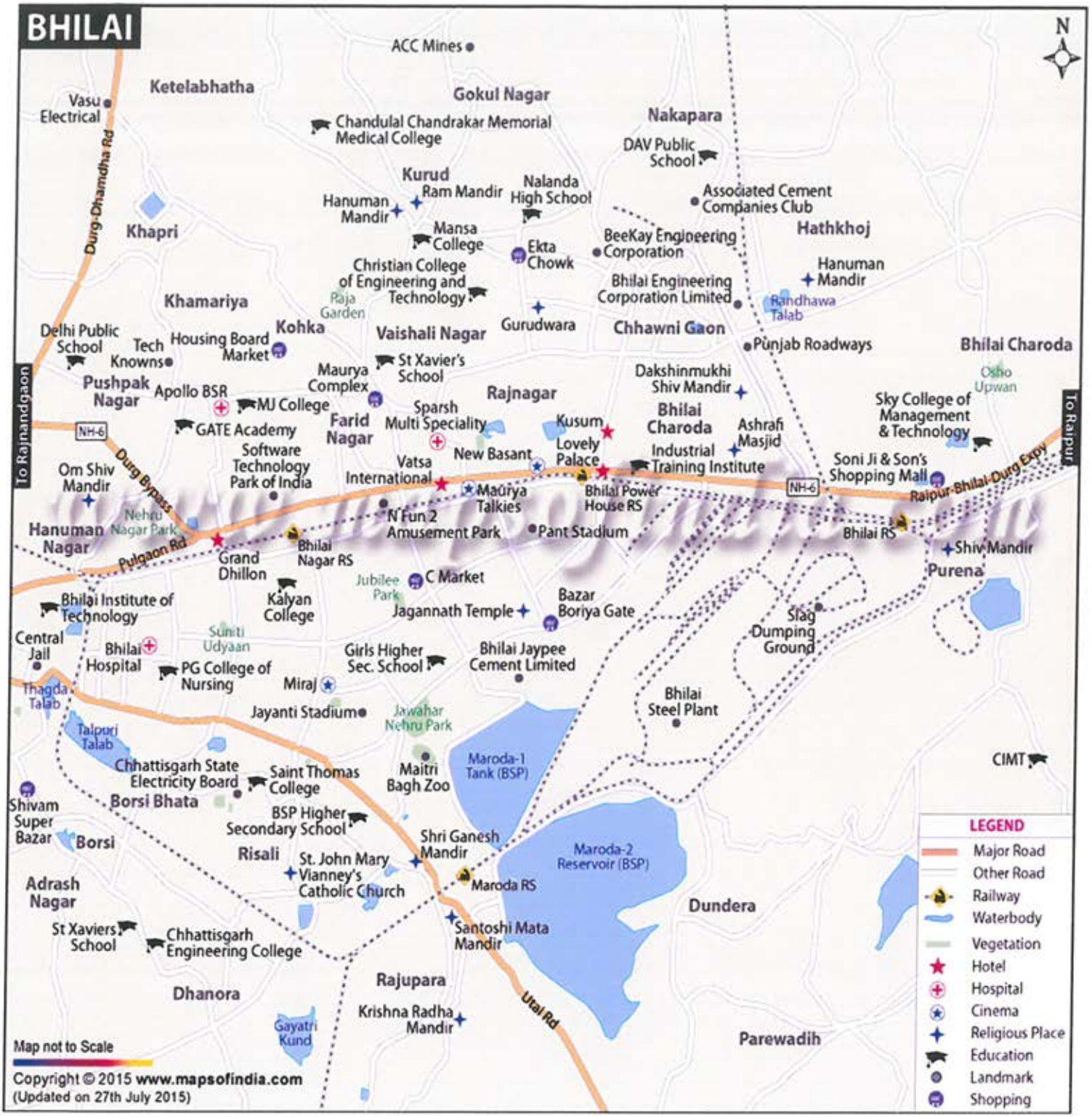
	emission control system for 3 converters in SMS-II to improve the Converters work zone environment				
	• Water Recycling from Outlet-B	LONG TERM	31.10.2021	Bhilai Steel Plant	
	• Water Recycling from Outlet-C	LONG TERM	31.12.2021	Bhilai Steel Plant	
	M/s Sail Refractories Unit, Maroda, Bhilai, Distt. Durg (C.G.) • Changing of complete set of filter bags of mixing section, ball mill section and mag carbon bricks manufacturing section of shop-II. • Installation of dust suppression system for air borne coal dust.	SHORT TERM SHORT TERM	30.04.2019 30.04.2019	M/s Sail Refractories Unit	
	M/s Vishnu Chemicals Ltd., Plot No. 18-26, Industrial area, Bhilai, Distt. Durg (C.G.). • Internal roads of industry to be blacktopped / concreted.	MID TERM	30.05.2019	M/s Vishnu Chemicals Limited	

	Other industries of Industrial Estate, Bhilai • Blacktopping/ concretization/ maintenance of Internal roads in respective units • Tree plantation in the premises of respective units	MID TERM LONG TERM	30.05.2019 October 2019	By the respective units By the respective units	
	Industries of Light Industrial Area, Bhilai • Blacktopping/ concretization/ maintenance of Internal roads in the respective units • Tree plantation in the premises of respective units • Installation of wet scrubber in respective wire drawing units of the area to control air pollution.	MID TERM LONG TERM SHORT TERM	30.05.2019 October 2019 30.04.2019	By the respective units By the respective units By the respective units	
	M/s Niros Ispat Pvt. Ltd., Plot No. 14/A, Heavy Industrial area, Bhilai Distt. Durg (C.G.) • Blacktopping/ concretization/ maintenance of internal roads.	SHORT TERM	30.05.2019	M/s Niros Ispat Pvt. Ltd.	

	M/s Rover Referactories and Metal Pvt.Ltd., Heavy Industrial Area, Hathkhoj, Bhilai Distt.Durg (C.G.)				
	• Installation of multistage control pollution system (wet scrubber, venturi-scrubber, cyclone separator for control of air pollution.	SHORT TERM	30.05.2019	M/s Rover Referactories and Metal Pvt. Ltd.	
	• Tree plantation in the premises.	LONG TERM	October 2019	M/s Rover Referactories and Metal Pvt. Ltd.	
	• Blacktopping/ concretization/ maintenance of Internal roads	SHORT TERM	30.05.2019	M/s Rover Referactories and Metal Pvt. Ltd.	
	Other industries of Heavy Industrial Area, Hathkhoj, Bhilai				
	• Blacktopping/ concretization/ maintenance of internal roads in the respective units.	SHORT TERM	30.05.2019	By the respective units	
	• Tree plantation in the premises of respective units.	LONG TERM	October 2019	By the respective units	
	• Increase in the stack height in the respective units.	MID TERM	30.06.2019	By the respective units	
	• Installation of wet scrubber in the respective wire drawing units.	SHORT TERM	30.04.2019	By the respective units	

	Industries of Engineering Park, Bhilai • Blacktopping/ concretization/ maintenance of Internal roads in the respective units. • Tree plantation in the premises of respective units. • Increase in the stack height in the respective units. • Installation of wet scrubber in the respective wire drawing units.	SHORT TERM LONG TERM MID TERM SHORT TERM	30.05.2019 October 2019 30.06.2019 30.04.2019	By the respective units By the respective units By the respective units By the respective units	-
STRENGTHENING AAQ MONITORING	Three NAMP stations are operational in Bhilai area and 01 CAAQMS is operational at Civic Centre by Bhilai Steel Plant. 02 more CAAQMS stations are proposed in Bhilai City.	LONG TERM	March 2020	CECB	
PLANTATION	Tree plantation in the available open space of the industrial cluster.	LONG TERM	October 2019	CSIDC and Nagar Nigam Bhilai	-

PUBLIC AWARENESS	Issue of advisory to public for prevention and control of air pollution.	SHORT TERM	March 2019	CECB	-
	Involvement of school and other academic institution in awareness program.	SHORT TERM	June 2019	CECB	-
OTHERS	Providing web portal for redressal of public complaints.	SHORT TERM	April 2019	CECB	-


BHILAI
N
ACC Mines
Ketelabhatha
Vasu Electrical
Durg-Dhamdha Rd
Gokul Nagar
Chandulal Chandrakar Memorial Medical College
Nakapara
DAV Public School
Kurud Ram Mandir
Hanuman Mandir
Nalanda High School
Associated Cement Companies Club
Khapri
Mansa College
Ekta Chowk
BeeKay Engineering Corporation
Hathkhoj
Christian College of Engineering and Technology
Hanuman Mandir
Bhilai Engineering Corporation Limited
Raja Garden
Randhawa Talab
Khamariya
Gurudwara
Delhi Public School
Tech Knowns
Housing Board Market
Kohka
Vaishali Nagar
Chhawni Gaon
Punjab Roadways
Bhilai Charoda
Osho Upwan
To Rajnandgaon
Pushpak Nagar
Apollo BSR
MJ College
Maurya Complex
St Xavier's School
Rajnagar
Dakshinmukhi Shiv Mandir
Sky College of Management & Technology
To Raipur
NH-6
GATE Academy
Farid Nagar
Sparsh Multi Speciality
Kusum Lovely Palace
Bhilai Charoda
Ashrafi Masjid
Durg Bypass
Software Technology Park of India
New Basant
Industrial Training Institute
Soni Ji & Son's Shopping Mall
Om Shiv Mandir
Vatsa International
Maurya Talkies
Bhilai Power House RS
Raipur-Bhilai-Durg Expy
Nehru Nagar Park
N Fun 2 Amusement Park
Pant Stadium
Bhilai RS
Hanuman Nagar
Pulgaon Rd
Grand Dhillon
Bhilai Nagar RS
Shiv Mandir
Purena
Jubilee Park
C Market
Bhilai Institute of Technology
Kalyan College
Jagannath Temple
Bazar Boriya Gate
Slag Dumping Ground
Central Jail
Sunit Udyaan
Bhilai Hospital
PG College of Nursing
Girls Higher Sec. School
Bhilai Jaypee Cement Limited
Miraj
Thagda Talab
Jayanti Stadium
Jawahar Nehru Park
Bhilai Steel Plant
Talpuri Talab
Chhattisgarh State Electricity Board
Saint Thomas College
Maitri Bagh Zoo
Maroda-1 Tank (BSP)
CIMT
Shivam Super Bazar
Borsi Bhata
BSP Higher Secondary School
Borsi
Risali
Shri Ganesh Mandir
St. John Mary Vianney's Catholic Church
Maroda-2 Reservoir (BSP)
Maroda RS
Adrash Nagar
Dundera
St Xaviers School
Chhattisgarh Engineering College
Santoshi Mata Mandir
Rajupara
Dhanora
Krishna Radha Mandir
Utai Rd
Gayatri Kund
Parewadih
Map not to Scale
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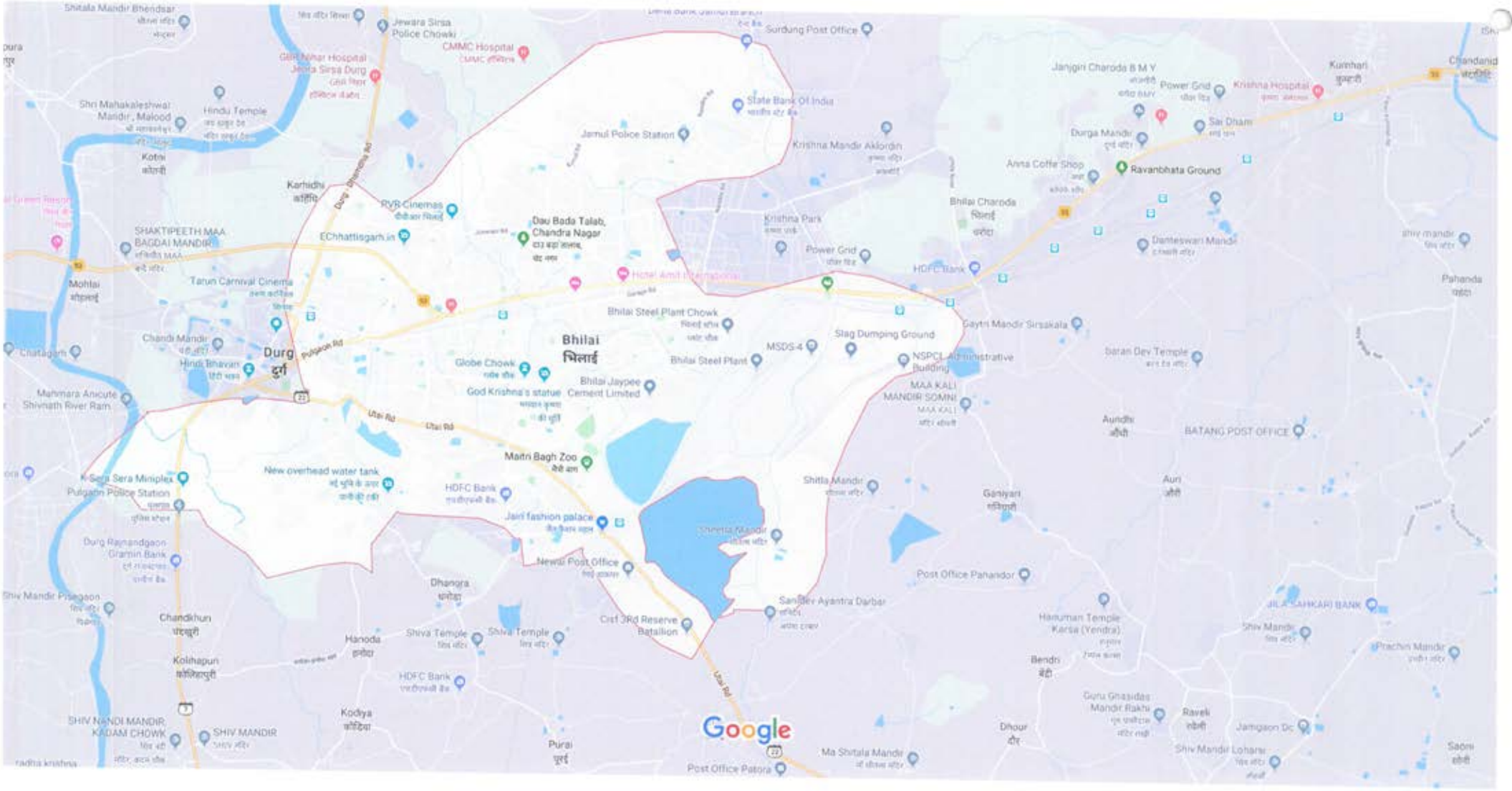
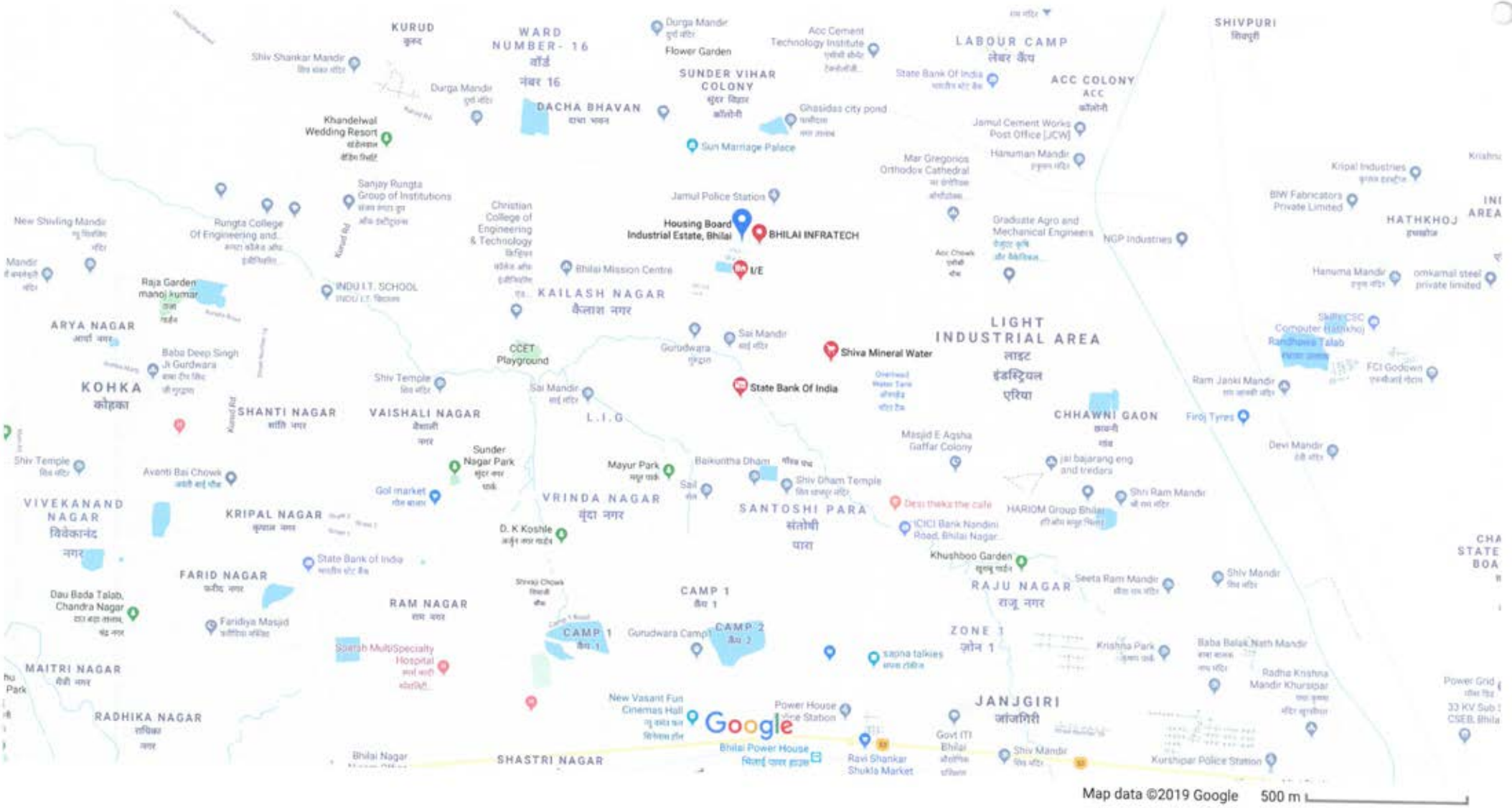
LEGEND
Major Road
Other Road
Railway
Waterbody
Vegetation
Hotel
Hospital
Cinema
Religious Place
Education
Landmark
Shopping

Google Maps Bhilai



Google Maps housing board industrial estate bhilai



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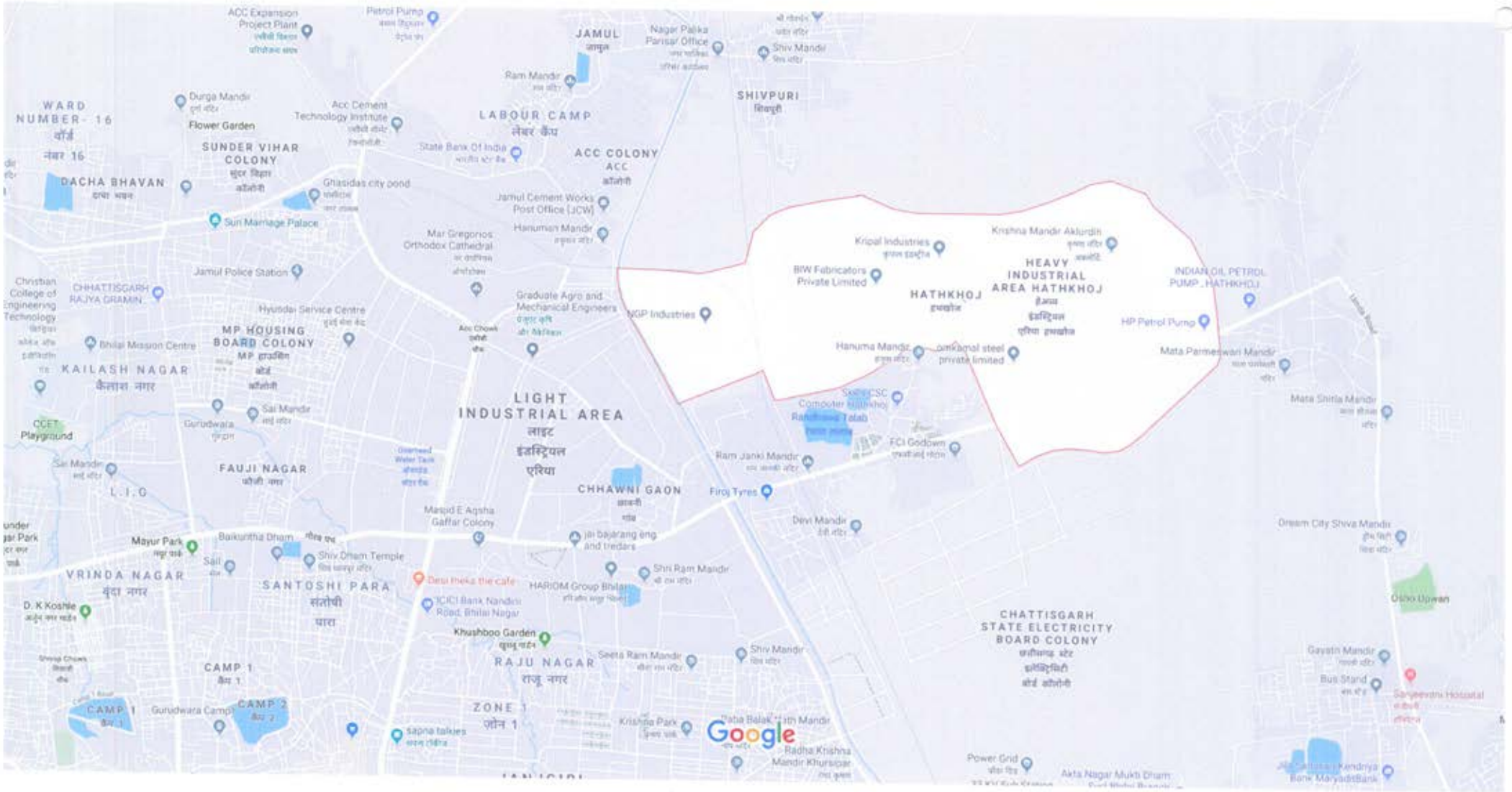
Google Maps Heavy Industrial Area Hathkhoj



Google Maps Light Industrial Area

Map data ©2019 Google 500 m

Google Maps engineering park

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