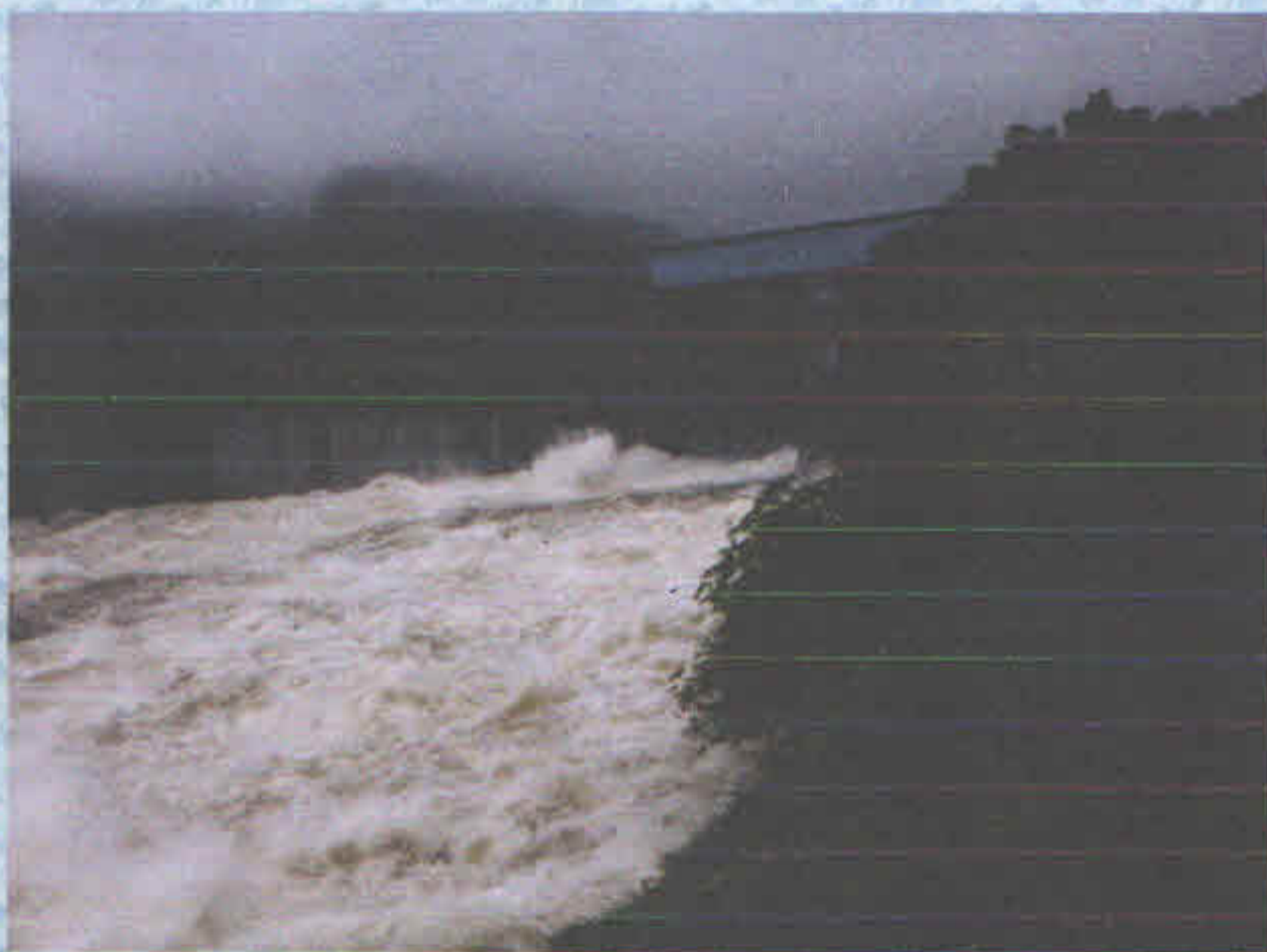


**COMPREHENSIVE STUDY ON POLLUTED
STRETCHES OF KUNDALIKA-ARE KHURD,
DIST RAIGAD.**



**PREPARED BY
SKY LAB ANALYTICAL LABORATORY
KALYAN**

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Chapter 1

KUNDALIKA RIVER

□ INTRODUCTION

Kundalika is a small river which originates from the mountain ranges of Sahyadri. It flows down from the hilly areas near Roha city and merges in the creek at Salav. The river originates at a small village called as 'Bhira', where a hydro power plant of M/s Tata is located. The tail race water discharged in the river makes it Perennial River. The river flows by the Roha Industrial area established by Maharashtra Industrial Development Corporation and the Roha city, which is at about 150 Km south of Mumbai. The other important villages located on the banks of Kundalika River are Kolad, Korlai and Salav.

Kundalika is a perennial river due to regular discharges of tail race water from Hydro power station at Bhira. River Kundalika is fed by the tail race water from Tata Power's Mulshi Dam through a series of hydroelectric projects and dams, at Ravalje followed by Bhira and Dholvan, where the water is released in the morning hours typically at 6 am. The gush of the water reaches Sutarwadi at 7:30 am and water reaches at Kolad at 10:00 am.

The river Kundlika meets the Arabian Sea near Salav/ Revdanda. The stretch between Are Khurd about 5 Km downstream from Roha and the sea at Salav / Revdanda is estuarine part subject to tidal effects. MIDC has established an industrial estate at Dhatav, about 8 Kms upstream from Roha city, on the bank of this river. The river Kundlika is a prime source of water for the industrial estate and also for the nearby villages & Roha city. Kundalika River from Bhira to Are Khurd is a sweet water zone (A II Class). The intake of water supply for MIDC and Roha city is at the upstream of the industrial estate.

After conventional treatment (Clari-floculation, filtration and disinfection) water is supplied by MIDC to industries, Roha city and nearby villages.

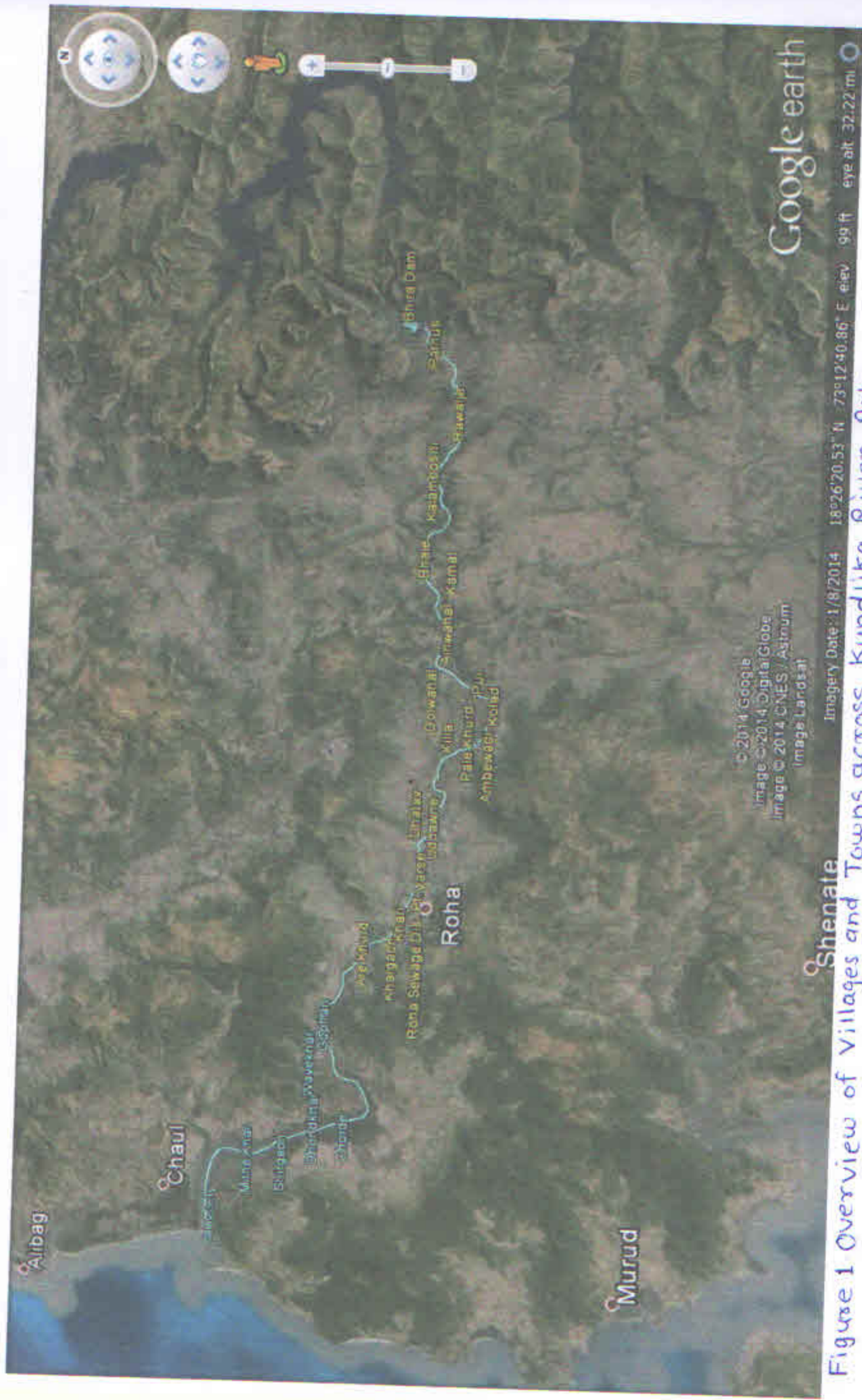


Figure 1 Overview of Villages and Towns across Kundlika River, Roha. Kundalika's water is mainly consumed by industries, in Roha MIDC, town and villages on Kundalika River and M/s Welspun Industries at Salva.

The Probable reasons of Pollution of River:

- The domestic waste (waste water and solid waste) from Villages from Bhira to Roha / Ashtami city is directly discharged into the river without any treatment and becomes a regular & substantial source of Pollution of the sweet water zone of the river.
- Chemical spillages being washed with rain water finding way into the river during early monsoon.
- Unauthorized disposal of Hazardous waste on the bank & vicinity of river which may find its way into the river in rainy season.
- The washing of chemical tankers into the river at many places.

Chapter 2

Need of the Kundalika river study

- Rapid development in the Kundalika basin- urbanization & industrialization.
- The amount of domestic waste water generated increasing as the population along the river is increasing.
- The present scenario of river pollution has made it necessary to assess the environmental impact on the river system.
- The present study is duly designed to address the problems of river water pollution & investigate the environmental impact on the river system.

Maharashtra Industrial Development Corporation (MIDC), has developed an industrial area known as Roha Industrial Estate in 1970s. This area is a Chemical Industry Zone as declared by MIDC. The industrial area is located at Dhatav village. There are many chemical industries located in this area manufacturing a variety of chemicals such as organic chemicals, dyes & pigments, food colors, pharmaceuticals and some inorganic chemicals. The development of industries also resulted in a major influx of people from all over the country, which gave a unique cosmopolitan nature to Roha and surrounding area, which was till then only farming and trading town.

Industrial Area of Maharashtra Industrial Development Corporation (MIDC) is located at 135 KM from Mumbai off Mumbai-Goa Highway, of Kolad. Roha Industrial Area has 38 industrial units. Roha Industries Association (RIA) is a body representing industrial units in this area.

List of major industries located near the Kundalika River

Industry name	Products
Albright & Wilson chemicals India ltd.	Synthetic Detergents And Active Detergents Sulphonates
Kores (India) Ltd.	Basic Blue Dyes
Anek Prayog Pvt.Ltd	Products/Medicines, Dealers
Neelicon Food Dyes & Chemicals Ltd.	Dyes
Anshul Speciality Molecules Ltd.	Chemical Products
Pepsico India Holdings (P) Ltd.	Pepsi
Bec Chemicals Pvt.Ltd	Chemicals
Rathi Dye Chem Ltd.	Dyes & Intermediates Chemical Products
Calchem Industries India Ltd	Calcium Carbonate
Roha Dychem Pvt.Ltd	Dyes
Clariant Chemicals (India) Ltd.	Chemical Products Or Preparations Of Kind Used In Textiles Leather Industries
Sadhana Nitro Chem Ltd	Other Derivative, Ethyl Esters
Deepak Nitrite Ltd	Chemicals
Sempertrans Nirlon Pvt.Ltd	Conveyor Belt
The Dharamasi Morarji Chemicals Co.Ltd	Resorcenol
Aryan Pesticides Pvt. Ltd.	Ethyl Hexyl Nitrate
Colour Chem Ltd.	Adhesives Based On Rubber Or Plastics (Including Artificial Resins)
Excel Industries Ltd	Ethyl Anthranilate Aminialcohol Phenols Amino Acid Phenols And Other Amino Compounds With Oxygen Functions
Iftex Oil & Chemicals Ltd	Fuel Additives
Kisan Irrigations Ltd.	Rigid Pvc Pipes & Hdpe Pipes
Lime Chemicals Ltd.	Ethyl Acetate
Mark Omega Organic Industries Ltd.	Benzaldehyde - Cyclic Aldehydes Without Other Oxygen Function
Raptakops Brett & Co. Limited	Iscflav Cr Capsules
Sudarshan Chemical Industries Ltd.	Manufacture Of Pesticide (Insecticide Fungicides And Weedicides)
Unichem Laboratories Pvt. Ltd.	Sulbactum Sodium (Bulk Drug)
Vidhi Dyestuffs Mfg. Ltd.	Other, Including Mixtures Of Colouring Matter Of Two Or More Of The Subheading Nos. 3204.11 To 3204.19
Taskar Chemicals Pvt.Ltd	Industrial Lubricant, Stearates, Wire Drawing Lubricant, Metal Working Lubricant
FDC Ltd.	
Waman Industrial Chemicals Ltd.	Waman Industrial Chemicals Ltd.

Common Effluent Treatment Plant (CETP) of Roha Industries Association

Ministry of Environment and Forests, Government of India, promoted a scheme for providing Common Effluent Treatment Plants for industrial clusters for prevention and control of water pollution. MoEF, MIDC and MPCB facilitated the industry associations by providing land at concessional rate, grant of capital subsidy etc. for providing CETP for each chemical zone in Maharashtra. The idea behind this was to collect and treat effluent from individual small scale industrial unit at a common facility and then discharge it to designated point of discharge, the medium and Large scale industries were also clubbed with this scheme for taking advantage of the drainage system as well as expert technical and administrative manpower which could be spared by these industries.. RIA also took part in this venture by way of forming RIA-CETP Co. Society Limited in 1994 as a Special Purpose Vehicle (SPV) to establish CETP for Roha Industrial Area.

RIA-CETP conducted treatability studies on the composite effluent on a pilot plant of



Figure 2Roha Industrial Association CETP

Source RIA CETP

1 m³/day capacity which was run for 6 months before Detailed Project report (DPR) was prepared. The same was approved by IIT-Mumbai, MIDC & MPCB.

Based on the proposal as per DPR, CETP of 10 MLD capacity was established between 2002 & 2004 and commissioned in 2005. Total project cost was Rs. 12.5 Crores. The funds were made available by Members' contribution - 50%, MIDC subsidy - 20%, MPCB subsidy - 5% & MoEF subsidy - 25%.

There was lot of learning in the process of installation of the plant. To treat a complex mixture of different effluents is a difficult task.

During the course of plant operation, various modifications and improvements have been incorporated. Many problems were also encountered. These were addressed time to time. RIA CETP Society had continuous interaction with member industries for input quality of effluent. Valuable inputs were also sought from various people viz. officials from MPCB / MIDC & experts in the field for improvements in treatment efficiency.

Meanwhile, the process of coming up of new units in the industrial area and existing units expanding their production capacities started and resulted in the increase of the effluent quantity considerably. Therefore, Roha CETP Society decided to go for up-gradation & expansion of CETP in two phases, 5 MLD and 7.5 MLD in next few years.

Work on the treatability study for present composition of effluent has been started. Lab scale pilot plant is also being operated in plant laboratory on continuous basis. Thus the capacity of Roha CETP would become 22.5 MLD. RIA-CETP is also considering use of suitable instrumentation in the up-graded expansion project so as to have simpler operation.

The effluents after treatment are being disposed in the creek through the HDPE pipeline, 9.2 km away from CETP, in the saline zone of Kundalika estuary, by MIDC. Work of extension of the disposal pipeline further, as per the scientific study conducted by National Institute of oceanography, is in progress, by MIDC.

In view of the writ petition in Honourable High Court, Mumbai, the performance of the CETP is being monitored by MPCB closely. Circular in this respect has been issued by MPCB (copy enclosed). Directions have also been issued by MPCB to RIA CETP (copy enclosed). The monitoring data is being displayed on MPCB web site. Data for April to Nov. 2014 is enclosed. The BOD, COD disposal norms are not yet satisfied by the CETP.

RIA CETP Co-op. Society Ltd.

Details of RIA CETP Co-op. Society Ltd.	
Location:	Plot No. 9/11, Roha MIDC, Dhatav, Tal-Roha, Dist. Raigad.
Status:	In Operation
Frequency:	Twice in month

Complete details of	
Name	RIA CETP Co-op. Society Ltd.
Comissioning year	Mar-2004
Adress	Plot No. 9/11, Roha MIDC, Dhatav, Tal-Roha, Dist. Raigad.
Designed capacity (MLD)	10
Actual effluent load (MLD)	9.5
Status	In Operation
No. of member industries	56
Treatment units	Primary, Secondary
Mode of disposal	Into Marine Coastal areas

Contact details	
Contact person	Shri. D. D. Galam
Contact number	(02194)263599
Fax	(02194)263599
Email	dd_galam@rediffmail.com

Solid Waste Management	
Consented quantity	4000
Actual quantity	3370
Mode of disposal	MWML, Taloja

MPCB consent	
Consent to establish outward nos.	BO/CC/Raigad-94/PC-624 dtd. 10.07.01
Consent to operate outward nos.	BO/WPAE/CETP/Raigad-146/CC-45 dtd. 25.10.04
Valid uptill	2008-12-31

Subsidy Status							
Total project cost Rs (in lacs)	Expenditure incurred (in lacs)	Authorities	Subsidy eligible on project cost (in lacs)	Total eligible subsidy on expenditure incurred (in lacs)	Amount subsidy released (in lacs)	Balance subsidy on expenditure incurred (in lacs)	Balance subsidy on total project cost (in lacs)
1250	1250	MoEF	312.5	312.5	312.5	0	0
		MIDC	250	250	250	0	0
		MPCB	62.5	62.5	62.5	0	0

Latest average analysis result			
Reading date	pH	BOD	COD
2014-11-10	7.2	130	320
2014-11-03	7.2	90	240
2014-10-27	7.0	140	384
2014-10-20	7.1	130	360
2014-10-16	7.5	260	488
2014-10-13	7.5	180	432
	7.25	155	370.67

Latest average analysis result			
Reading date	pH	BOD	COD
2014-11-10	7.2	130	320
2014-11-03	7.2	90	240
2014-10-27	7.0	140	384
2014-10-20	7.1	130	360
2014-10-16	7.5	260	488
2014-10-13	7.5	180	432
Average	7.25	155	370.67

Latest average analysis result			
Reading date	pH	BOD	COD
2014-09-29	7.2	130	320
2014-09-22	7.2	90	240
2014-09-15	7.0	140	384
2014-09-11	7.1	130	360
2014-09-09	7.5	260	488
2014-09-01	7.5	180	432
Average	7.18	143.33	404

Latest average analysis result			
Reading date	pH	BOD	COD
2014-08-25	7.2	130	320
2014-08-19	7.2	90	240
2014-08-11	7.0	140	384
2014-08-04	7.1	130	360
Average	7.28	150	396

Latest average analysis result			
Reading date	pH	BOD	COD
2014-07-28	7.2	130	320
2014-07-25	7.2	90	240
2014-07-21	7.0	140	384
2014-07-14	7.1	130	360
2014-07-07	7.5	260	488
Average	7.28	192	433.6

Latest average analysis result			
Reading date	pH	BOD	COD
2014-06-30	7.2	130	320
2014-06-23	7.2	90	240
2014-06-16	7.0	140	384
2014-06-12	7.1	130	360
2014-06-09	7.5	260	488
2014-06-02	7.5	180	432
Average	7.4	177.5	448

Latest average analysis result			
Reading date	pH	BOD	COD
2014-05-26	7.2	130	320
2014-05-19	7.2	90	240
2014-05-12	7.0	140	384
2014-05-05	7.1	130	360
Average	7.45	104.25	326

Latest average analysis result			
Reading date	pH	BOD	COD
2014-04-21	7.2	130	320
2014-04-15	7.2	90	240
2014-04-10	7.0	140	384
2014-04-07	7.1	130	360
2014-04-01	7.5	260	488
Average	7.06	110	272

FW: Samling of CETP Mahad as per Hon. HC directives dtd.1.03.2012 in PIL 17/2011

PSODIVISION

Sent: Wednesday, December 12, 2012 4:54 PM

To: Y.B.Salunkhe

Importance: High

From: Dr.Amar Supate

Sent: Saturday, March 03, 2012 11:32 AM

To: SRO MAHAD

Cc: RO RAIGAD; T.V.Gude; Dattatray T. Devale; JD Water; PSODIVISION; Milind Mhaskar

Subject: Samling of CETP Mahad as per Hon. HC directives dtd.1.03.2012 in PIL 17/2011

Dear Mr Salunkhe,

Since u and RO were present in Hon. HC on said hearing U are aware of orders passed.

In view of this, I propose you following to ensure and prove that the actions of MPCB are based on scientific grounds.

1. Collect 24 hr composite samples of CETP, Mahad Inlet & Outlet on daily basis for next three weeks. Record physical observations of final sample & field pH.
2. Divide sample collected in three sets a) MPCB b) CETP and c) Control. (Min. 2.5 lit each)
3. Send these JVS samples duly sealed with joint signature of authorized person from CETP & MPCB FO to I/c Central Lab with a covering letter stating urgency. Letter must mention parameters for both inlet & Outlet samples. Also state results of which parameters are required on daily basis.
4. CETP sample set to be handed over to CETP immediately and to be analysed in presence of MPCB FO for pH & COD. Other two sets to be sent to i/c. C. Lab, under preserved condition where one set will be analysed by C.Lab and another will be preserved following due procedures.
5. Results submitted by C. Lab shall be sent to CETP by e-mail immediately after confirmation at SRO office.
6. FO, MPCB shall collect the hourly data of CETP Inlet & Outlet for Flow and pH.

In case SRO needs additional manpower RO Raigad shall make necessary arrangements. He may consider sparing FO from SRO Rolia.

For further guidance u shall be in touch with RO & I/c. C. Lab.

Dr. A.R. Supate
Principal Scientific Officer
MPCB,
Sion, Mumbai



SAVE A TREE. PLEASE PRINT THIS E-MAIL ONLY IF NECESSARY.

MAHARASHTRA POLLUTION CONTROL BOARD

Tel : 2402 0781 / 2401 0437

Fax : 2402 4068

Visit us at :

Website : <http://mpcb.mah.nic.in>

E-mail : mpcb@vsnl.net



Kaipataru Point,
2nd, 3rd & 4th floor
Opp. Cineplanet,
Near Sion Circle, Sion (E),
Mumbai - 400 022.

BY R.P.A.D./FAX/HAND DELIVERY
NO MPCB/l/c JD(WPC)/ 2202

Date: 04/09/2012

To
RIA CETP Co-op Society Ltd
Plot No. 9/11, MIDC Dhatav,
Tal-Roha, Dist. Raigad

Sub : Directions u/s 33A of the Water (Prevention & Control of Pollution) Act, 1974.

- Ref : 1) This office communication dtd. 3/3/2012 through the l/c Joint Director (WPC), MPCB.
2) Latest Report on Monitoring done by the Regional Office and / or Sub-Regional Office submitted to the Board.

WHEREAS, you have been granted Conditional Consent to operate your CETP subject to certain terms & conditions mentioned therein. AND WHEREAS, it is obligatory on your part to maintain & operate the CETP to the capacity of effluent generated from the cluster of industries, which are Members of CETP in the said area.

AND WHEREAS, on the basis of record of your case, the reports of the officers of the Board and after making necessary inquiry, it has been observed that your CETP is inadequate to collect & treat pre-treated effluent from the Members of the CETP. It is also observed that you are not monitoring the quality of pre-treated effluent being sent to your CETP and thereby, you are discharging sub-standard effluent into the nearby area at the disposal point and thereby causing serious pollution in the surrounding area.

AND WHEREAS, as per the Revised Guidelines for Centrally Sponsored Scheme of Common Effluent Treatment Plants published by the Ministry of Environment & Forests, Govt. of India on 15/3/2012, the responsibility of the Member Industries has been defined in clear-cut terms as under

- (i) The Member of CEPT shall carry the required primary treatment in case, having the effluent generation less than 25 M³/per day to meet the inlet parameters of CETP and other large scale and medium scale industries should treat their effluent to the inlet standards prescribed for the CETP.
- (ii) The Members shall monitor specified quality parameters and flow rate of the effluent on daily basis and submit the monitoring data to the CETP Operator on regular basis.

AND WHEREAS, the role of the CETP Operator has also been defined in the said Guidelines as under .

- (a) CETP shall be managed professionally
- (b) SPCB will be entitled in case of repeated violation, to bring in new professional management
- (c) The CETP Operator shall be responsible for compliance of inlet quality and flow from the contributing industries and shall provide status of non-complying units to the SPCB for taking further necessary action.
- (d) The CEPT Operator shall carry the required treatment to meet final effluent quality standards for CETP and shall be responsible for operation and maintenance.
- (e) The CEPT Operator shall monitor specified quality outlet parameters and flow rate on daily basis and to submit the monitoring data to the SPCB on regular basis. It shall monitor online at outlet of CETP and IT based linkage shall be provided by the Operator to SPCB, so as to display it on the website of SPCB.

AND WHEREAS, the Maharashtra Pollution Control Board has taken review of all 22 CETPs and it has been observed that you are one of the CETP in the category of 'Highly Exceeding the Prescribed Standards', where it has been observed that the following parameters are exceeding as per monitoring done by the officials of the Board and reproduced in comparison with the Consent / EPA Standards :

Sr.No.	Parameter	EPA Standards	Average Standards as per Actual Monitoring for the Month of March, 2012.
1	pH	5.5 to 9	7.22
2.	BOD	100 mg/l.	258 mg/l.
3.	COD	250 mg/l.	710.4 mg/l.
4.	S.S.	100 mg/l.	226 mg/l.

Thereby, you are causing serious pollution at the point of discharge. It has been observed that your existing treatment & disposal arrangements are inadequate to treat the effluent collected from the Member industries to the prescribed standards and therefore, upgradation / improvement in operation & maintenance is required to be done in a time bound manner, so as to achieve the standards prescribed in the Consent/EPA Standards.

AND WHEREAS, it has been observed that you are not operating & maintaining CETP properly, you are also not monitoring the operation of CETPs as well as the effluent being sent by the Members of the CETP, having poor vigilance, improper recordings of the violations being carried out by the CETP Members and non-reporting of such type of violations to the MPCB. You are also not even giving proper primary treatment to the effluent collected from the Members (Neutralization, coagulation of chemicals at primary treatment level).

AND WHEREAS, the Incharge Joint Director (Water Pollution Control), MPCB has issued necessary directions to you to submit concrete Action Taken Report in respect of making improvement/upgradation of CETPs with enhancement of the capacity and to comply with a number of conditions imposed stipulated in the letter dtd 3/3/2012

AND WHEREAS, you have not submitted the fullfledged information in respect of compliance of those conditions. You are, therefore, hereby directed comply with the following conditions :

- a) You shall not accept the effluent of high COD streams from the industries beyond consented limits or otherwise permitted for time being. You shall strictly observe lock & key provision to ensure that, the CETP is not getting overloads resulting into non-performance or sub-standard performance. You shall also not collect the penal charges from industries discharging high COD beyond tolerance limit of CETP discharge. You shall install online flow meter, pH meter & TOC analyzer at inlet and outlet with data logger and real time display.
- b) You shall submit a concrete proposal for making improvement / upgradation in your CETP with enhancement of capacity if any, so as to achieve the outlet parameters of CETP alongwith bar chart within 15 days from the date of receipt of these directions.
- c) You shall discontinue receiving pre-treated effluents from the concerned individual industrial unit after giving prior notice to stop all manufacturing activities, when, the CETP finds that the effluents being sent by an individual industrial unit into the CETP inlet will not be in a position to treat it for the purpose of meeting with the CETP outlet norms because of an individual industrial unit into the CETP inlet are carrying such high pollution load.
- d) You shall ensure that any industrial unit in the MIDC, which is Member of CETP having its own effluent treatment plant shall not carry on any manufacturing activity whenever its effluent treatment plant is not functioning for any reason whatsoever, whether for maintenance, repairs or otherwise.
- e) You shall call upon your Members to stop manufacturing activities, whenever CETP is not functioning for any reason whatsoever.
- f) You shall ensure that you and the concerned MIDC as well as the concerned large scale and medium scale units shall make necessary arrangements for providing sumps for storing effluents being received from the individual industry for the purpose of treatment in the CETP.
- g) You shall ensure that every industrial unit having its own ETP shall have a separate electric meter for its effluent treatment plant.

- h) You shall furnish an irrevocable bank guarantee of Rs.10 Lakhs ensuring the compliance of the above directions/consent conditions, which shall be valid for a period of one year, to be submitted within 15 days time to the respective Regional Officer, MPCB.

In case, you fail to comply with the above directions, the Board will have no option than to initiate appropriate legal action against you including forfeiture of bank guarantee, which may please be noted.



(Milind Mhaiskar)
Member Secretary

Copy to: Sr.Law Officer(P&L Divn.)/I/c Joint Director(WPC), MPCB, Mumbai – for information and necessary follow up.

Copy to: Regional Officer, MPCB, Raigad/Sub-Regional Officer, MPCB, Raigad-II - for information and necessary follow up action.

MAHARASHTRA POLLUTION CONTROL BOARD

Phone: 4010437/4020781
4045589/4037124/4035273
No.8,
Fax: 4024068 /4023516



Mumbai : 400 022

Kalpataru Point, 3rd & 4th floor,
Sion, Matunga Scheme Road

Opp. Cine Planet Cinema,
Near Sion Circle, Sion (E)

No. MPCB/JD(WPC)/B- 7233

Date: 12/12/2012

CIRCULAR

To,

- 1) Regional Officer-Thane/Kalyan/Navi Mumbai/Raigad/ Pune/Kolhapur/
Aurangabad /Nagpur, MPC Board
- 2) Sub-Regional Officer- Navi Mumbai-I/II/III(Taloja)/Raigad-I/II/III/Mahad/Roha/Thane-
I/II/ Tarapur-I/II/Kalyan-I/II/III/Bhiwandi/Pune-I/II/Pimpri Chinchwad/ /Satara/ Solapur/
Kolhapur/Ratnagiri/Chiplun/Sangli/ Aurangabad-I/II/Latur/Nanded/Parbhani/ Nagpur-I
/II/III/
- 3) The Sr. Scientific Officer, I/C. Central Laboratory, MPCB/Regional Laboratory,
Nagpur
- 4) Scientific Officer, I/c. Regional Lab. Pune/Nashik/Aurangabad/Thane/Chiplun
MPCB

Part- A (To be followed by Field Staff)

Sub: Consistency and procedure to be followed for CETP sampling
and hoisting results on Board's website.

The Maharashtra Pollution Control Board is monitoring CETPs in Maharashtra. While going through the results on the MPCB website, it is observed that frequency of samplings is inadequate and there is inconsistency in display of reports. It is directed that henceforth the sampling for the CETP will be carried out and reports will be displayed on MPCB website in the following manner:

- 1) The field staff will have to collect JVS samples (**grab samples**) of each CETP on every Monday of the week.
- 2) The JVS collected on 1st Monday of the month shall be sent to the laboratory for further analysis. The results shall be obtained by Friday/Saturday of the same week and shall be displayed on website by 2nd Monday (i.e. next week) of the month. Likewise, the samples collected on 2nd, 3rd and 4th Monday shall be displayed on website of Board on next Monday, i.e. 3rd, 4th and 1st (next month) Monday respectively.
- 3) The parameters of grab samples collected on 2nd & 4th Monday shall only carry the parameters such as, pH, BOD, COD, SS, Oil & Grease and TDS. While grab samples collected on 1st & 3rd Monday of the week shall carry all consented & outlet parameters of CETP.

- 4) Besides, the grab sampling indicated in point no.1, 2 and 3 above, **composite sampling** shall be carried out for all CETPs in your jurisdiction once in a month between 1st to 15th of every month and results shall be obtained by 30th of every month and displayed on website. The composite samples shall carry all CETPs outlet parameters.

This circular shall be scrupulously followed by all the field staff consistently without fail.

In case the Field Officers do not receive the results as per the schedule from laboratory the same shall be brought to the notice of concern Regional Officers and PSO immediately with a copy to JD (WPC) for information.

Part-B
(To be followed by Laboratory Staff)

Sub: Analysis of CETP samples received from respective SROs reg.

Refer to Principal Scientific Office e-mail dated 03/03/2012 (copy enclosed) stating guidelines for Field Offices and Laboratories regarding proper sampling and analysis, protocols to collect grab samples and composite samples. Following the protocol and scientific procedure, Field Offices concern shall collect following samples from every CETP.


Sr No.	Schedule day for Sampling	Type of sample	Parameters to be analyzed by Lab.
1.	Monday, 1 st week	Grab	All consented CETP discharge/outlet parameters
2.	Monday, 2 nd week	Grab	pH, BOD, COD, SS, TDS, Oil & Grease
3.	Monday, 3 rd week	Grab	All consented CETP discharge/outlet parameters.
4.	Monday, 4 th week	Grab	pH, BOD, COD, SS, TDS, Oil & Grease
5.	Monday, 5 th week	Grab	pH, BOD, COD, SS, TDS, Oil & Grease
6.	1 st Fortnight	Composite	All consented CETP discharge/outlet parameters.

All Sub-Regional Offices concern shall ensure submission of samples to the Laboratory strictly as per above schedule before 5 'O Clock every Monday alongwith relevant field data. All such samples shall be analyzed for pH, BOD, COD, SS, TDS, Oil & Grease by the laboratory by end of the same week and shall submit results through e-mail to SROs concern and JD (WPC) for information.

The grab samples collected in 1st and 3rd week and composite samples collected in 1st fortnight of the month shall be analyzed for rest of the consented CETP discharge parameters and results shall be made available within three week from the date of receipt of samples at Lab. to the concern SROs.

In case the laboratory do not receive the samples as per the schedule or with incomplete data sheet, improper samples containers etc. the same shall be brought to the notice of concern Regional Officers and JD (WPC) immediately with a copy to P.S.O. for information.

Please note the above instructions are followed scrupulously.


(Rajeev Kumar Mital)
Member Secretary

Copy to : AST/JD(APC)/JD(WPC)/SLO/PSO/RO(HQ), MPCB – for information & necessary action.

MAHARASHTRA POLLUTION CONTROL BOARD

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Kalpataru Point, 2nd, 3rd & 4th Floor
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Near Sion Circle, Sion (E)
Mumbai- 400 022.

BY R.P.A.D./FAX/HAND DELIVERY

NO.MPCB/JD(WPC)/B-7376

Date: 15/12/12

To
RIA CETP Co-op Society Ltd
Plot No. 9/11 MIDC Dhatav,
Tal-Roha, Dist. Raigad

Sub : Directions u/s 33A of the Water (Prevention & Control of Pollution) Act, 1974 and u/s 31A of the Air (Prevention & Control of Pollution) Act, 1981 r.w. the Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2008.


- Ref :
1. Orders passed by Hon'ble High Court of Judicature at Mumbai in the Public Interest Litigation No.17/2011 from time to time.
 2. Directions Issued by the Incharge Joint Director(WPC), MPCB dtd.03/03/2012 onwards.

We refer to the orders passed by the Hon'ble High Court of Judicature at Mumbai in the Public Interest Litigation No.17/2011 filed by Nicholas Almedia v/s State of Maharashtra and Ors. from time to time, as well as the Guidelines issued by the CPCB from time to time, followed by the directions issued by the Incharge Joint Director(WPC), MPCB dtd.03/03/2012 & from time to time, with regard to the making available the important information in respect of various CETPs on their website for the information of all the concerned including the Regulatory Authorities.

Being one of the Common Waste Management Authority, it becomes necessary on your part to have a proper website, giving details of the establishment of your society, various permissions obtained from the Statutory Authorities, the information in respect of the Members of CETP with the categorization of the industries (Green, Orange & Red) as well as SSI, MSI & LSI, the inlet & outlet designed capacity of CETP with reference to various parameters, the details of CETP units, disposal arrangement, the point of discharge duly authorized by the Competent Authority like NIO, first Consent to Establish and renewal granted from time to time with a copy of last Consent to Operate, proposals for improvement / expansion / modification of the ETP and disposal arrangements and standards laid down under the provisions of the Environment (Protection) Rules, 1986 with the monitoring results.

You are, therefore, directed to establish appropriate website, giving all the details, so as to bring more information in respect of your common facility to the notice of all concerned within 30 days time and to communicate the website details to the MPCB, so as to establish proper link of your website on the website of the MPCB. You shall furnish an irrevocable bank guarantee of Rs.2.5 Lakhs, ensuring the compliance of these directions within stipulated time, which shall be valid for a period

of one year to be submitted within 7 days time from the date of receipt of these directions. You are also directed to send your official e mail/s for further correspondence, in future.


(Rajiv Kumar Mital)
Member Secretary

Copy submitted to: Hon'ble Chairman, MPCB, Mumbai – for favour of information pl.

Copy to: Sr.Law Officer(P&L Divn.)/Asstt.Secretary(Tech.)/Chief Accounts Officer/
Joint Director(AIR)/ Principal Scientific Officer/Joint Director(WPC)/Joint
Director(PAMS)/Regional Officer(HQ), MPCB, Mumbai – for information and
necessary follow up action.

METHODOLOGY

Sampling locations were decided as per the CPCB guidelines for surface water monitoring,

taking into consideration the best uses and the water abstraction and waste water disposal points.

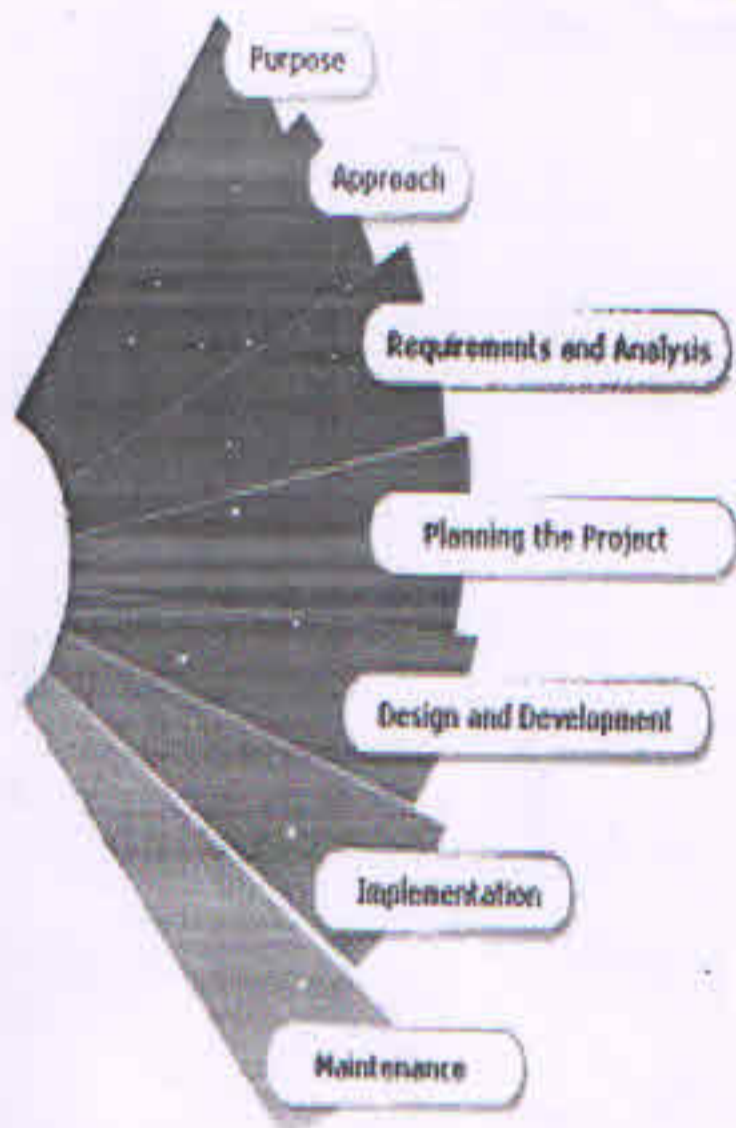
The list of parameters tested and their standard reference methods are provided in Annexure I.

As per the requirements of the study & CPCB guidelines the samples were collected all along the stretch of the river.

The sampling was carried out from 25th June to 27th June & 4th July to 5th July 2014

Sampling stations were identified upstream and downstream of locations where significant waste water outfalls like CETP, city sewage drains and industrial effluent outfalls are placed. Samples were also taken from the estuarine part of the river. The

details of the sampling locations are provided in **Table 1**.



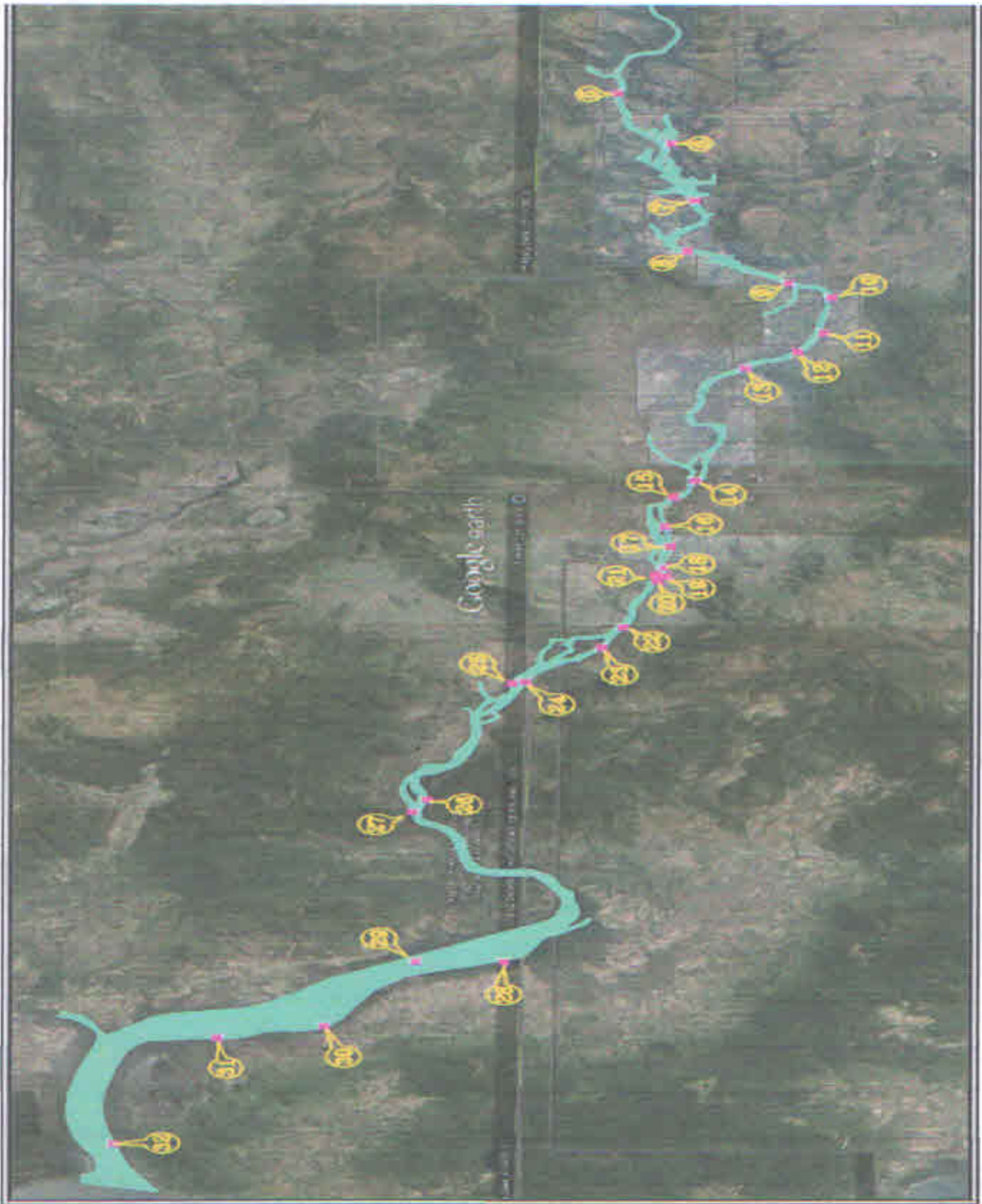


Table 1 List of Sampling Locations for the Kundalika River

Bhira Dam	01	Varse	17
Patnus	02	Upstream of Roha Sewage outlet	18
Rawalje	03	Roha Sewage Outlet	19
Kalmboshi	04	Downstream of Roha Sewage outlet	20
Bhale	05	Ashtami	21
Kamat	06	khari	22
Ainwahal	07	Khargaon	23
Dolwahal	08	Arekhurd	24
Pui	09	Zholambe	25
Kolad	10	Gofan.	26
Aambewadi	11	Wave khar	27
Palekhurd	12	Chorde	28
Killa	13	Dhond khar	29
Dhatav	14	Shirgaon	30
Uddawne	15	Methekhar	31
Rothkhurd	16	Salav jetty	32

Description of Sampling Locations:

The sampling locations are presented in Annexure 1 at the end of the report which shows the entire river stretch.

Bhira Dam (01): It is the first location for the sampling and is the point of origination of Kundalika River. The Bhira Dam receives portion of its water the Hydro-Electric Power Project operated by Tata Power Company. The Bhira Hydroelectric Project is the third hydropower plant installed by The Tata Power Company Ltd. (TPCL) in 1927. The Total capacity of generating electricity at Bhira power plant is 80MW.

Patnus (02): Patnus is a Village in Mangaon Taluka in Raigad District. The village is not densely populated.

Rawalje (03): The third sampling location was at the downstream of the village. The village is not densely populated and has a population of around 1,000 people.

Kalamboshi (04): The fourth sample was taken from the down-stream of Kalamboshi village which has a population of approximately 1500 individuals. The major occupation in the area is farming.

Bhale (05): Balhe is a very small village located along the bank of Kunalika River. The population of the village is approximately 250. At this location there is a small confluence of two streams. One is the main stream of Kundalika River while the other stream is coming from other water fall located upstream.

Kamat (06): The Location was selected because it is a junction of confluence of two streams of the same river. The two streams of the river divide circling the small village of Yeral and meet again near the Kamat Village. The village has a very low population of 350 individuals.

Ainwahal (07): The seventh sampling location was selected at the Ainwahal village which has a small population of 250 households.

Dolwahal (08): The sampling was carried out down stream of the village of Dolwahal as there is a small dam located near the village. The sampling was carried out down stream of the dam. The village though has a very small population.

Pui (09): The sampling was carried out in the downstream of the village of Pui. This village has a population of 1400 souls.

Kolad (10): The sampling was conducted at this village. The village has a population of around 1600 individuals. It is famous for various activities such as river rafting and also located on the Mumbai Goa National Highway and a market place. The Kolad railway station is the terminal point of Roll on Roll Off (RORO) service between Goa and Kolad on Konkan Railway. This is a unique service by Konkan railway which relieves the highway off heavy truck traffic. Kolad has a high tourist / floating population.

Aambewadi (11): The sampling was carried out downstream of the village considering that the untreated domestic waste generated in the village is discharged into the river. The village has a population of 4,200 households which is relatively higher than any other villages considered previously.

Palekhurd (12): The sampling for the twelfth location was carried out downstream of the village of Pale khurda.

Killa (13): The village has a considerable amount of population having nearly 2,300 individuals. The sampling was carried out up stream of the village. MIDC water intake is at this location. The water is supplied to the industries and the villages and towns along the river after conventional treatment.

Dhatav (14): The fourteenth sampling location was selected near the village of Dhatav.

Uddawane (15): The fifteenth sampling location was selected as Uddawane. There are several other villages which are located around the bank of the river such as Roth khurda, Dhatau, Sangade, etc. from where the domestic waste water is likely to be discharged in the river stream.

Rothkhurd (16): The sampling for the sixteenth location was carried out in the downstream of the village of Roth Khurd. The small streams in and along the industrial area flow into the river on upstream side of this point.

Varse (17): Varse is a very small but densely populated village. The sampling was carried out down stream of the village.

Upstream of disposal point of Sewage from Roha (18): The eighteenth sampling location for the present study was taken from the upstream of the point where the sewage of Roha Town is discharged into the river. It is important to note that there is no facility established in the town to treat the sewage. According to the Census of Govt. of India the city of Roha has an estimated population of 90,000 souls.

Roha Sewage Outlet (19): The nineteenth sampling location is of the sewage directly discharged in to the river body. It is important to note that the sewage discharge is through open gutters and not having underground sewerage and treatment system.

Water Sewage Downstream (20): The 20th sampling location was around 200m down stream of the the sewage discharge point in to the river system.

Ashtami (21): To check the dispersal of the discharged sewage the sampling was conducted further downstream of the earlier location.

Khari (22): The sampling at this location was carried out as it lies upstream of small cluster of villages such as Kharegaon, tareghar and Kharapti.

Khargaon (23): The sampling was carried out downstream of the village of Khargaon.

Arekhurd (24): It is a small village located along the river lying downstream of the Khargaon village. It is important to note that there is a small jetty on the upstream of the village where in small ships are docked for repairs. The ships are mostly likely to be of the fishermen community who conduct fishing for their living.

Zolambe (25): The small village of Zolambe is a centre for ship repairing activities. Therefore sampling for the twenty-fifth location was conducted downstream of the village.

Moreover it is important to highlight that the village is the interface between the river and estuarine part subject to ingress of sea water.

Gofan (26): This is the point of confluence of sea water and fresh water. The salinity conditions are bound to change as per the high tide and low tide conditions. The activities such as ship repairing are carried out on small scale along the coast of the river between the village of Zolambe and Gofan. The treated effluent from MIDC area is discharged into the saline zone of the Kundalika river in this area.

Wave khar (27): the village is located on the opposite side to the Gophan village. But the major difference is that like Gophan there are no jettys for ships. It is a village having roughly a population of 1500 individuals.

Chorde (28): the village is located downstream to a number of villages such as Talekhar, Belkhar, Sonkhar, Savroli, etc and has a population of 2,000 individuals.

Dhond khar (29): The village has adjoining several adjoining villages such as Tadwadi, Satirde, Tadgaon etc. These villages are sparsely populated but have no proper sewage disposal facility.

Shirgaon (30): The village has a population of 750 households with several other villages located around it. There are no approach roads to access the river water or estuarine water.

Mithe khar (31): This village is the second last sampling location for the present study. It is located downstream of the village of Shirgaon.

Salav jetty (32): The Salav Jetty is the last location where the Kundalika River meets the Arabian Sea. There is major fishing activity carried out near the jetty and the jetty also has a small port for the ships. There are no villages located near the jetty. There is an engineering industry (Sponge Iron Unit of M/s. Welspun Ltd) located at this point.

In the present case of Kundalika River, the sea water ingress is noticed upto the village Khargaon. This is an estuarine zone or coastal zone in the river. According to the regulations of MPCB, the parameters and standards for those parameters are different than that for fresh water.

In a coastal segment marine water is subjected to several types of uses. Depending of the types of uses and activities, water quality criteria have been specified to determine its suitability for a particular purpose. Among the various types of uses there is one use that demands highest level of water quality/purity and that is termed a "designed best use" in that stretch of the coastal segment.

Based on this, primary water quality criteria have been specified for following five designated best uses:

Table 2 Class Designated best use

S. N.	Category of Sea Water Zone	Type of use
1	SW-I	Salt pans, Shell fishing, Mariculture and Ecologically Sensitive Zone.
2	SW-II	Bathing, Contact Water Sports and Commercial fishing.
3	SW-III	Industrial cooling, Recreation (non contact) and Aesthetics.
4	SW-IV	Harbour.SW-V Navigation and Controlled Waste Disposal.
5	SW-V	Navigation and Controlled Waste Disposal.

Classification of the estuarine portion of Kundalika is not done by MPCB, so far.

RESULTS AND DISCUSSIONS

The tests for selected parameters were conducted as per the BIS & APHA procedures and CPCB guidelines provided in Annexure II. The results for the samples are presented in this part.

For the convenience of understanding the results are divided into various sections. The section provides results for the samples taken at different locations to determine the water quality of Kundalika River

As mentioned above the River water quality was assessed at 32 different locations. The results for the sampling locations are presented in Annexure III.

The results indicate that there is presence of E-coli & MPN in all the samples taken for the study, indicating pollution due to domestic wastes.

The pH of all the samples is well within the permissible limits of the MPCB. But there is a variation in the content of Total solids and Total Dissolved solids across each sample and no uniform pattern is observed.

Similarly the Total Hardness of the water body changes from location to location. Moreover there is a significant change in the concentration of Hardness around the same location on the other side of the bank of the river. This can be seen by considering the two sampling locations of Ashtami and the locations considered upstream and downstream of the discharge of sewage of Roha city. Moreover, the hardness is more than double in the estuarine part of the river as compared to the fresh water areas lying before the village of Gophan.

The Dissolved oxygen was observed to be satisfactory at all locations. BOD, COD values indicate some contamination. But it has not resulted in depletion of Dissolved Oxygen.

Heavy Metal concentration has been found to be within limits.

The probable sources of river pollution:

- The discharge of Domestic waste (waste water and solid waste) from the villages / towns along the bank of rivers.
- Accidental discharges from industries into the local nalla.
- Unauthorized disposal of Hazardous waste / non Hazardous solid waste on the bank of river & vicinity, which may find its way into the river in rainy season.
- Spillage of Hazardous chemicals in the industrial premises and the vicinity which may find its way into the river in rainy seasons.
- Washing of chemical tankers in the river at places.
- Inadequate treatment and disposal arrangement for the industrial effluent by the industries and CETP.

Remedies and proposed Action Plan

- Store and handle the hazardous chemicals neatly avoiding spillages.
- Store and handle Hazardous / non Hazardous wastes neatly in a specially designated area
- Spillages if any should be mopped up and sent to CHWTSDF
- Do not allow the storm water to mix up with the industrial effluent OR domestic effluent
- Keep the storm water drainage neat and clean by arranging regular cleaning
- Ensure proper operation and maintenance of the effluent treatment plants as per standard Operation Manual
- Carry out performance audit of the manufacturing plant and pollution control system scientifically and implement recommendations thereof
- Participate actively in the CETP and association activities to ensure cleanliness in the industrial area

- Upgrade the CETP taking into consideration of the future development of the industrial and associated activities in the area
- Extend the effluent disposal pipeline upto the point suggested by NIO after scientific study and carry out surveillance monitoring annually.
- Provide necessary arrangements for sewage treatment and disposal and solid waste management at all the villages and towns particularly located on the bank of the river
- Environmental studies may also be undertaken after monsoon to ascertain the status in fair weather season

RESULTS OF ANALYSIS

Location No.	Description	Parameter	UNIT	Odour	pH	Total Solids	TDS	Oil & Grease	Chloride as cl	Alkalinity as	Residual free	DO	COD	BOD	Total Hardness
			Specified norms			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	Bhira Dam			UnOb.	6.5-8.5	85	77	Nil	32	200	0.2	5.1	76	24	300
2	Patnus			UnOb.	6.81	100	86	Nil	45	64	Nil	5.8	84	30	44
3	Rawalje			UnOb.	6.92	112	93	1	42	52	Nil	6.1	60	18	58
4	Kalmboshi			UnOb.	6.6	80	70	Nil	49	62	Nil	6	48	14	62
5	Bhale			UnOb.	6.49	67	59	Nil	40	80	Nil	5.6	72	21	80
6	Kamat			UnOb.	7.21	95	85	Nil	55	58	Nil	5.8	80	24	78
7	Ainwahal			UnOb.	6.96	88	82	1	61	106	Nil	4.9	76	20	70
8	Dolwahal			UnOb.	6.9	97	78	Nil	39	68	Nil	4.6	88	27	42
9	Pui			UnOb.	7.11	90	72	Nil	48	82	Nil	6.1	100	31	42
10	Kolad			UnOb.	6.88	92	84	Nil	52	72	Nil	6.3	92	25	50
11	Aambewadi			UnOb.	6.96	83	73	Nil	35	60	Nil	5.1	84	20	42
12	Palekhurd			UnOb.	6.69	109	91	Nil	39	58	Nil	5.3	104	28	40
13	Killa			UnOb.	6.72	165	112	Nil	50	52	Nil	5.7	120	38	42
14	Dhatav			UnOb.	7.2	101	78	Nil	64	50	Nil	5.7	96	27	23
15	Uddawne			UnOb.	6.64	127	94	Nil	71	62	Nil	4.8	104	36	50

Location	Description	Parameter	Unit	pH	Total Solids	TDS	Oil & Grease	Chloride as Cl	Ammonia as N	Free Ammonia	DO	COD	BOD	Total Hardness
		UNIT			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
16	Rothkhurd		UnOb.	6.94	176	142	1	122	102	Nil	4.2	124	26	50
17	Varse		UnOb.	6.87	187	168	1	155	84	Nil	5.1	102	29	58
18	Upstream of Roha		UnOb.	6.76	192	175	Nil	181	84	Nil	5	118	24	60
19	Roha Sewage		Ob	6.18	166	147	1	307	76	Nil	4.8	132	28	74
20	Downstream of Roha		UnOb.	6.38	203	181	2	272	104	Nil	4.9	148	33	92
21	Ashtami khari		UnOb.	6.84	277	239	Nil	338	62	Nil	5.3	124	27	44
22	Khargaon		UnOb.	7.61	410	376	1	519	98	Nil	5.4	116	22	62
23	Arekhurd		UnOb.	6.92	1281	869	1	715	70	Nil	6.1	120	30	64
24	Zholambe		UnOb.	6.86	1590	1276	2	1010	56	Nil	6.4	136	25	62
25	Gofan.		UnOb.	6.71	2088	1573	1	1212	64	Nil	6	152	34	50
26	Wave khar		UnOb.	7.24	3072	2767	2	1815	86	Nil	5.3	132	27	50
27	Chorde		UnOb.	7.03	5125	4112	1	3422	118	Nil	5.3	160	41	130
28	Dhond khar		UnOb.	7.81	7196	6120	2	5209	98	Nil	6.1	124	23	104
29	Shirgaon		UnOb.	7.01	8126	7109	2	6311	72	Nil	6.3	140	34	44
30	Methekhar		UnOb.	7.87	9396	8356	2	7175	102	Nil	4.8	176	39	94
31	Salav jetty		UnOb.	7.82	10354	8814	4	7440	112	Nil	4.9	164	47	92
32			UnOb.	7.65	12476	9385	3	8210	98	Nil	5.2	188	42	108

Annexure II

Guidelines for Selection of Parameters

category of Fresh Water Best Usage	A-I Unfiltered Public water supply after approved disinfection	A-II Public water supply with approved treatment equal to coagulation, sedimentation & disinfection.	A-III Not fit for human consumption, Fish & Wildlife Propagation.	A-IV Fit for Agriculture, Industrial cooling & process water.
Chemical Qualities : Maximum allowable concentration				
Toxic Substances				
Arsenic (As)	0.3 mg/l	0.3 mg/l	1.0 mg/l	0.1 mg/l
Cadmium (Cd)	0.01 mg/l	0.01 mg/l	-	-
Chromium (Cr)	0.05 mg/l	0.05 mg/l	0.05 mg/l	0.2 mg/l
Cyanide (CN)	0.05 mg/l	0.1 mg/l	0.05 mg/l	0.2 mg/l
Lead (Pb)	0.1 mg/l	0.1 mg/l	-	0.1 mg/l
Boron (B)	-	-	-	2.0 mg/l
Mercury (Hg)	0.001 mg/l	0.001 mg/l	0.001 mg/l	-
Gross alpha activity	3 PCI/l	10-9 uc/ml	3 PCI/l	3 PCI/l
Gross Beta activity	30 PCI/l	10-8 uc/m	30 PCI/l	30 PCI/l
Substances affecting health				
Fluoride (F)	1.5 mg/l	1.5 mg/l	-	1.0 mg/l
Nitrates (NO ₃)	45 mg/l	45 mg/l	-	-

Annex. II Contd.

category of Fresh Water Best Usage	A-I Unfiltered Public water supply after approved disinfection	A-II Public water supply with approved treatment equal to coagulation, sedimentation & disinfection.	A-III Not fit for human consumption, Fish & Wildlife Propagation.	A-IV Fit for Agriculture, Industrial cooling & process water.
Substances affecting the portability of water				
pH	6.5 to 8.5	6.0 to 8.5	6.5 to 9.0	6.5 to 9.0
T.D.S.	-	T.D.S.	T.D.S.	-
Total Solids	1500 mg/l.	1500 mg/l.	-	-
Total Suspended Solids	25 mg/l	-	-	-
Total Hardness (Caco3)	50 mg/l	-	-	-
Total Residual Chlorine	-	-	-	-
Electrical conduct at 25. C	-	-	1000 x 10 ⁻⁶ mhos	3000 x 10 ⁻⁶ mhos
Free Carbon Di Oxide	-	-	12 mg/l	-
Free Amonical Nitrogen	-	-	1.2 mg/l	-
OIL & Grease	-	-	0.1 mg/l	-
Pesticides	-	-	0.02 mg/l	-
Biotic Index	-	-	6.0 mg/l	-
Total Ammonical Nitrogen	1.5 mg/l	1.5 mg/l	-	50 mg/l
Chlorides (Cl)	600 mg/l	600 mg/l	-	600 mg/l
Sulphates	400 mg/l	400 mg/l	-	1000 mg/l
Copper (Cu)	1.5 mg/l	1.5 mg/l	-	-
Manganese (Mn)	0.5 mg/l	3.0 mg/l	-	-
Iron (Fe)	1.0 mg/l	5.0 mg/l	-	-
Sodium	-	-	-	-
Zinc (Zn)	15.0 mg/l	1.5 mg/l	5.0 mg/l	5.0 mg/l

Phenolic Compounds	0.002 mg/l	0.002 mg/l	0.05 mg/l	-
Alkyl Benzene sulphates	1.0 mg/l	1.0 mg/l	-	-
Mineral OIL	0.3 mg/l	0.3 mg/l	-	-
Ammonia	1.5 mg/l	1.5 mg/l	-	-
B.O.D. (5 days 20°C)	2.0 mg/l(Monthly average of at least 10 samples)	5.0 mg/l(Monthly average of at least 10 samples)	10 mg/l	30 mg/l
C.O.D.	-	-	-	150 mg/l
D.O.	Not less than 5mg/l(Monthly average of 100 samples)	4.0 mg/l	Not less than 3 mg/l	Not less than 2 mg/l
Bacteriological Standards (MPN/100)	Coliform Bact. 250	Not greater than 5000		

Annexure III

WATER QUALITY STANDARDS FOR COASTAL WATERS

MARINE OUTFALLS

S.No.	Parameter	Standards	Rationale/Remarks
1.	pH range	6.5-9.0	As specified by New England Interstate Water Pollution Control Commission.
2.	Dissolved Oxygen	3.0 mg/l or 40 percent saturation value, which ever is higher.	To protect aquatic lives
3.	Colour and Odour	None is such concentration that would impair any usages specifically assigned to this class.	As specified by New England Interstate Water Pollution Control Commission.
4.	Sludge deposits, Solid refuse floating oil, grease & scum.	None except for such small solids, amount that may result from discharge of appropriately treated sewage and/or individual waste effluents.	As in(1) above
5.	Fecal Coliform	500/100 ml (MPN)	Non exceeding 1000/100 ml in 20 percent of samples in the year and in 3 consecutive samples in non-summer months

Source : EPA, 1986 [GSR 7, dated Dec. 22, 1998]

References

Water resources Department (Govt. of Mah.): <http://mahahydro.org/homg.htm>

MPCB, 2014: Coastal Water Standards,

<http://mpcb.gov.in/images/pdf/CoastalwaterStandards.pdf>

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Location No.	Description	Parameter	Sulphate	comp. As C ₆ H ₅ OH	Ammonical-N	Chromium as Cr+6	Iron as Fe	MPN org/100 ml	E-Coli/ Coliform	Cadmium	Copper	Lead	Arsenic	Manganese	Fluoride
		UNIT	mg/L	mg/L	mg/L	mg/L	mg/L		Present /absent	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	Bhira Dam	IS 10500 / All class	200	0.001		0.05	0.3		absent	0.01	0.05	0.05	0.05	0.1	1.9
2	Patnus		39	BDL	0.11	0.002	0.28	130	Present	BDL	0.018	0.013	BDL	BDL	0.21
3	Rawalje		48	BDL	0.17	0.001	0.23	172	present	BDL	0.013	0.01	BDL	BDL	0.106
4	Kalmboshi		70	BDL	0.13	0.0038	0.29	138	Present	BDL	0.02	0.015	0.024	BDL	0.067
5	Bhale		61	BDL	0.19	0.0027	0.28	102	Present	BDL	0.016	0.012	0.035	BDL	0.39
6	Kamat		49	BDL	0.086	0.0032	0.28	93	Present	BDL	0.012	0.019	0.035	0.035	0.1
7	Ainwahal		55	BDL	0.24	0.0034	0.28	146	Present	BDL	0.012	0.016	BDL	0.047	0.075
8	Dolwahal		64	BDL	0.36	0.001	0.52	160	Present	BDL	0.019	0.013	0.018	BDL	1.05
9	Pui		77	BDL	0.14	0.0044	0.34	129	Present	BDL	0.013	0.018	0.017	0.056	0.067
10	Kolad		91	BDL	0.064	0.0038	0.4	186	Present	BDL	0.01	0.014	0.009	0.061	0.056
11	Aambewadi		60	BDL	0.098	0.034	0.4	110	Present	BDL	0.014	0.01	BDL	0.038	0.048
12	Palekhurd		82	BDL	0.17	0.004	0.33	157	Present	BDL	0.012	0.016	0.015	0.021	0.055
13	Killa		67	BDL	0.13	0.0025	0.26	146	Present	BDL	0.016	0.012	0.025	0.032	0.119
14	Dhatav		78	BDL	0.15	0.0032	0.28	113	Present	BDL	0.021	BDL	0.014	0.013	0.036
15	Uddawne		70	BDL	0.46	0.0052	Nil	182	Present	BDL	0.017	0.013	0.011	0.043	0.047
			83	BDL	0.18	0.0036	0.32	170	Present	BDL	0.02	0.018	0.025	0.039	0.042

Location	Description	Parameter	UNIT	Odour	pH	Total Solids	TDS	Oil & Grease	Chloride as cl	Hardness as CaCO ₃	Free chlorine	DO	COD	BOD	Hardness as CaCO ₃
16	Rothkhurd			UnOb.	6.94	176	142	1	122	102	Nil	4.2	124	26	50
17	Varsa			UnOb.	6.87	187	168	1	155	84	Nil	5.1	102	29	58
18	Upstream of Roha			UnOb.	6.76	192	175	Nil	181	84	Nil	5	118	24	60
19	Roha			Ob	6.18	166	147	1	307	76	Nil	4.8	132	28	74
20	Sewage Downstream of Roha			UnOb.	6.38	203	181	2	272	104	Nil	4.9	148	33	92
21	Ashtami			UnOb.	6.84	277	239	Nil	338	62	Nil	5.3	124	27	44
22	khari			UnOb.	7.61	410	376	1	519	98	Nil	5.4	116	22	62
23	Khargaon			UnOb.	6.92	1281	869	1	715	70	Nil	6.1	120	30	64
24	Arekhurd			UnOb.	6.86	1590	1276	2	1010	56	Nil	6.4	136	25	62
25	Zholambe			UnOb.	6.71	2088	1573	1	1212	64	Nil	6	152	34	50
26	Gofan.			UnOb.	7.24	3072	2767	2	1815	86	Nil	5.3	132	27	50
27	Wave khar			UnOb.	7.03	5125	4112	1	3422	118	Nil	5.3	160	41	130
28	Chorde			UnOb.	7.81	7196	6120	2	5209	98	Nil	6.1	124	23	104
29	Dhond khar			UnOb.	7.01	8126	7109	2	6311	72	Nil	6.3	140	34	44
30	Shirgaon			UnOb.	7.87	9396	8356	2	7175	102	Nil	4.8	176	39	94
31	Methekhar			UnOb.	7.82	10354	8814	4	7440	112	Nil	4.9	164	47	92
32	Salav jetty			UnOb.	7.65	12476	9385	3	8210	98	Nil	5.2	188	42	108

	Parameter	Sulphate	comp. As C ₆ H ₅ OH	Ammonical-N	Chromium as Cr+6	Iron as Fe	MPN	E-Coll/ Coliform	Cadmium	Copper	Lead	Arsenic	Manganese	Fluoride
	UNIT	mg/L	mg/L	mg/L	mg/L	mg/L	org/100m	Present /absent	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
16	Rothkhurd	79	BDL	0.89	0.015	0.3	160	Present	0.009	0.018	0.021	0.032	0.069	0.066
17	Varse	83	BDL	0.15	0.041	0.25	187	Present	0.002	0.023	0.018	0.047	0.071	0.072
18	Upstream of Roha Sewage	85	0.001	0.18	0.032	0.4	178	Present	0.005	0.016	0.023	0.049	0.063	0.058
19	Roha Sewage Outlet	91	0.001	0.21	0.025	0.12	260	Present	0.003	0.029	0.02	0.044	0.075	0.077
20	Downstream of Roha	84	0.001	0.66	0.029	0.43	183	Present	0.009	0.025	0.027	0.047	0.086	0.069
21	Ashtami	97	0.001	0.16	0.03	0.28	370	Present	0.003	0.027	0.031	0.039	0.1	0.119
22	khari	131	BDL	0.19	0.0042	0.38	190	Present	0.01	0.019	0.029	0.025	0.087	0.082
23	Khargaon	220	BDL	0.22	0.003	0.33	266	Present	0.002	0.023	0.036	0.027	0.096	0.074
24	Arekhurd	343	BDL	0.061	0.007	0.42	304	Present	0.004	0.031	0.042	0.019	0.083	0.412
25	Zholambe	217	0.001	0.22	0.002	0.06	280	Present	0.004	0.027	0.037	0.036	0.067	0.068
26	Gofan	222	0.001	0.18	0.016	0.4	284	Present	0.006	0.034	0.033	0.033	0.023	0.119
27	Wave khar	234	BDL	1.69	0.005	0.3	367	Present	0.004	0.048	0.038	BDL	0.055	0.62
28	Chorde	252	BDL	0.72	0.01	0.38	284	Present	0.01	0.029	0.046	0.05	0.071	0.17
29	Dhond khar	320	0.001	0.83	0.0036	0.36	379	Present	0.007	0.033	0.042	0.017	0.045	0.091
30	Shirgaon	343	BDL	0.2	0.003	0.4	407	Present	0.006	0.041	0.037	BDL	0.042	0.412
31	Methkehar	346	BDL	0.22	0.01	0.31	350	Present	0.01	0.039	0.039	0.012	0.089	0.19
32	Salav jetty	419	0.001	0.28	0.003	0.3	386	Present	0.007	0.027	0.03	0.034	0.037	0.133