



Research Article

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Bioremediation of Bhiwadi City Drain

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Mr R Prakash is an IIT Delhi Mechanical Engineering Graduate having passed out in the Year 1972.

He is running his Foundry Industry at Industrial Area at Bhiwadi-301019(Rajasthan)

Inspired by Hon. Prime Minister Mr Narendra Modi in 2014 during his clarion call for Swatchh Bharat, he thought of

contributing his time and energy towards this National Cause. He initially worked on Home Composting models for Individual Homes and then extended the same to

Higher Quantity which can be used by Individual Homes, Residential Community Living gated Societies and Municipalities across the country.

He is a Resource Person for National Center For Organic Farming, Ghaziabad.

After having developed the Composting Models, he then moved to Higher Value Addition to the Garbage and started working on Bio Enzymes.

He strongly believes and advocates that Bio Enzymes and Composting can be adopted as livelihood careers.

He has also been teaching School and College Students the details of Composting and Bio Enzymes.

Contact Details of Mr R Praksh are as under:-

Chief Mentor:- OSA Enviro (P) Ltd.,

F-431, RIICO Industrial Area, Bhiwadi-301019

15th December 2021

A project was planned to demonstrate the effectiveness of BioRemediation for Treatment of City Sewage as compared to Time consuming and Expensive STP (Sewage Treatment Plant)

Bhiwadi City drain is a strategic drain and because of Gravity, the flow of water is towards the Neighbouring State of Haryana and leads to

Inter-State Dispute. This Sewage City water is being left to flow without any Treatment.

Standard/ Conventional Water Treatment solutions are expensive and time-consuming. On the other hand Bio Remediation is a Ready-Made Solution and does not require Heavy Expenditure and can be set up in less than a week.

In the present case, the setup was Ready in Just 6 days.

The running cost in a Bio Remediation plant is also only 50% of a Regular STP

Pilot Lab Project to study the Impact on COD on Bhiwadi Nala

Project Initiated by:- RO, RPCB, Bhiwadi

Bhiwadi is the Flagship Industrial Area of Rajasthan and is responsible for more than 50% of the State Exchequer. As the Industrial Area Grew, the State Government, ULB, and RIICO created Wastewater Treatment plants as the need arose. Bhiwadi has a CETP(For Industrial Mixed Effluents) and some running STPs for the domestic residents.

Bhiwadi City has an estimated population of about 5 Lakh including Industrial Labour. These residents are scattered all over as under:-

In various labour colonies in the industrial area does not have any STP and this water flows without any Waste Water Treatment.

Within residential colonies developed by RHB and urban improvement trusts. Only a few of these have a dedicated STP. Balance wastewater flows untreated.

Residential gated communities developed by private builders. All of these are supposed to have an STP in house and be a Zero Waste Discharge. The majority of them are not operating properly.

On paper it looks that the system to treat wastewater is in place, however the status is quite different on the ground majority of the waste is domestic wastewater flows thru Open Drains and because of Gravity this water flows towards the neighbouring state of Haryana.

Mr Ram Prakash—a noted Industrialist of the Town and an Environmentalist by passion has been working towards a cleaner Bhiwadi as Chief Mentor of OSA ENVIRO P LTD, a 1972 passed Graduate from IIT - Delhi.

The bioremediation trials were first done in labs and then subjected to Field Trials. The first such trial was conducted on a waster water ponding near the DTO, Bhiwadi. This was carried out in the period 13th January 2021 to 3rd February 2021.

The following results were achieved: -

- Reduction in COD Of 87% down from 770 to 101
- Reduction in BOD Of 68% down from 85 to 27 (Copy of Report Annexed)

After the Initials trials of the efficacy of the process for the treatment of wastewater, a project was envisaged to provide a solution to the above menace and the main Bhiwadi City Drain passing through the Residential Colonies and finally merging in a Drain at Dharuhera(Haryana) Near Nagina Gardens was chosen.

Thereafter, in consultation with the Regional Office of Rajasthan Pollution Control Board, two Locations were identified for Sampling of the Wastewater.

Location A: Near CETP(As the wastewater before Treatment)

Location B: Near Nagina Garden(1200 metres from A)(As Wastewater after Treatment)

A sample was collected on 24 August 2021 from location A of the drain to test the water parameters.



This wastewater was treated in a Lab Setup and the results are as under:- Following results were observed in just a week's time.

Date	COD	Smell	BOD	Colour
24th August 2021	384	Stinking	502	Black grey
3rd September 2021	194	No Bad Odour	132	Clear
Reduction abs value	190	-	370	-
Reduction in %	49.47%	-	73.7%	-

After the initial lab set-up, a regular setup was made to treat the running wastewater in the Drain. This setup was made in the Complex of CETP., Bhiwadi since the Bhiwadi Drain is flowing by the side of CETP and for the purpose of control and Monitoring, the set up was erected at CETP, Bhiwadi.



Details of Drain are as under: -

The Drain is 16 Ft wide and about 6 ft deep running water in the normal course.

Further to measure the flow, this was directed thru a 2 Ft wide Opening in the Drain.



All other openings were closed and all the flow was directed thru a 2Ft Wide opening.

This also meant that we could measure the flow with an open Drain Ultrasonic Flowmeter

Which has been Installed.

The readings indicate a flow of around 30 MLD.

Thereafter two other structures were created to direct the flow and also another structure was created to help the growth of the Bacterial Colony.



Thereafter dosing of the OSAzymes was started.



Results started showing after a month

On 28th October COD before the dosing point was 524 and COD after 1 Km from the point of dosing was 246 i.e COD reduced by 53%

Conclusion

In static/Lab conditions, we could achieve a reduction in COD up to 74%. In Running Condition, the flow is measured to be 30-35 MLD. During the above period, a 53% reduction in COD has been reported

Date	COD Before	COD After 1km from dosingpoint	Reduction
28th October 2021	524	246	53%

Additional Benefits observed are as under: -

- The stinking Smell has vanished
- The Sludge has also been reduced

Way Forward: - The LUB or the concerned department may take up this as a starting point and initiate the BioRemediation process in all the Domestic Drains

RIICO may also initiate Bioremediation in various areas where the wastewater is ponding in the industrial area since all the drains are not properly maintained and there are waster water ponding at various places in Bhiwadi.