

# **Water Quality Monitoring of Kharda Khal and Preparation of Effluent / Waste Water Management Plan**

**Conducted by: Forum of Scientists, Engineers & Technologists (FOSET)  
Barrackpore Sub-Centre**

**Sponsored by: West Bengal Pollution Control Board**

## **SYNOPSIS**

Pollution of surface and ground water is largely a problem due to rapid urbanisation and industrialisation. The large scale urban growth due to increase in population or migration of people from rural areas has increased domestic effluents while industrial development manifested either due to setting up of new industries or expansion of the existing industrial establishments resulted in generation of industrial effluent. The present method of rapid transportation of these effluents and their ultimate disposal and treatment for making effluents innocuous and safe are inadequate, unplanned and their development at the hands of Municipal bodies and Corporations suffers through negligence and shortage of funds. With the apathy of Industrialist towards the treatment of the effluents from their respective units prior to discharge to sewers or open surface drains, storm water canals, rivers etc., the net result is large scale pollution of the water bodies which may act as source of water supply for domestic use of inhabitants of the localities.

The city of Kolkata and its Metropolitan area, known as the Kolkata Metropolitan Area (KMA) is located at the lowest stretch of the Gangetic Delta and spread over along the bank of the river Hooghly (Ganga). The districts located on the Western Bank are Howrah and Hooghly while Kolkata Metropolitan Area, North 24-Parganas and Nadia districts are located on the eastern bank. The main drainage system of Kolkata city is based on underground sewage linked with several pumping stations which in turns releases water into open channels namely Dry Weather Flow (DWF) and Storm Weather Flow (SWF). The major portion of the urban sewage generated in the Kolkata Metropolitan District is carried through this drainage system and discharged to the river Bidyadhari (80 km away from the river Hooghly) and also joins the sea in Bay of Bengal.

However, the drainage pattern of North 24-Pargana, Nadia, Howrah and Hooghly district are somewhat different as compared to Kolkata Metropolitan Area. Most of the combined effluent (domestic and industrial) is discharged directly to the river Hooghly through number of canals. These canals were constructed during the British period and meant either for navigation or storm water drainage or for the purpose of irrigation. Due to rapid urbanisation and industrialisation, huge quantity of domestic and industrial waste and waste water discharged to the river Hooghly through various canals. A minor quantity of domestic effluent (sewage) is treated in Sewage Treatment Plant (STP) commissioned under the Ganga Action Plan (GAP) before being discharged to the river.

Khardah is a Municipal Town under Barrackpore sub-Division of North 24-Parganas district of the West Bengal State. Khardah Khal is a storm water drainage canal originated about 4.45 KM South-East of Khardah Railway Station and traveled across the railway track of Sealdah - Ranaghat Main Line of Eastern Railway and flows more or less in the direction of South-East to North-West. The canal changed its course towards the West while it crossed the railway track and also Barrackpore Trunk Road (B. T. Road) before being finally discharged to the river Hooghly. The canal has divided the Municipal town in two halves. Since independence, a good number of chemical, metallurgical fertilizer, dying and bleaching industries were established around the vicinity of the canal. Some of these industries are discharging effluents directly to the canal, while some are through municipal surface drains at number of points. In absence of underground sewage and treatment facilities, municipal waste water generated in the Khardah and adjoining municipal towns namely Titagarh and Panihati is discharged through number of surface drains at various points along its length. Both Municipal and Industrial effluents / waste water are, however, reaching the river Hooghly through Khardah Khal.

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With a view to estimate the extent of pollution load being received by the river Ganga through the Khardah Khal and to make suitable recommendations for the same, **Forum of Scientists, Engineers and Technologists (FOSET)**, having registered office at 6/1, Sudder Street, Kolkata -700 016, an established non-governmental organisation engaged in development 1 generation 1 application in people's oriented Science and Technology in both rural and urban sector, proposed to the **West Bengal Pollution Control Board (WBPCB)** to carryout a survey for **WATER QUALITY MONITORING OF KHARDAH KHAL AND PREPARATION OF EFFLUENT/WASTE WATER MANAGEMENT PLAN**. The **West Bengal Pollution Control Board** has accepted the proposal of **FOSET** and awarded the work vide Work Order No.CS/43/WPB-Research/99, dated 01.01.1999 with the following board scope of services.

- Reconnaissance survey of the entire stretch of the Khal and the surrounding area identifying precisely the human settlement, intake points of various water sources joining the Khal, location of various industries and their effluent discharge points.
- To finalise the sampling points with a view to know effluent / waste water quality with respect to each known source.
- To assess the volume of discharge of the liquid effluent joining the main stream during various seasons.
- Collect effluent / waste water samples from each selected sampling stations at suitable intervals of each season and carryout analysis of samples in respect of their Physical, Chemical and Bio-logical characteristics

<b>Physical</b>	pH Total Suspended Solids (TSS)
<b>Chemical</b>	Chemical Oxygen Demand (COD) Oil and grease Mercury Lead Zinc Disolved Oxygen (DO)
<b>Biological</b>	Bio-chemical Oxygen Demand (BOD)
<b>Bacteriological</b>	Coliform organism (Total and Faecal)

**The effluent / waste water samples will be analysed at the West Bengal Pollution Control Board's Central Laboratory, located at 36, Theater Road, Kolkata -700 017 and the results will be incorporated in the report for further study and analysis of the same. The samples of phytoplankton Aquatic weeds etc., will be drawn and analysed by All India Institute of Hygiene and Public Health, 110, Chittaranjan Avenue, Kolkata -700 073**

**and the results will be incorporated in the report for further study and analysis of the same.**

- Drawing of Oxygen sag curve with the help of D.O. data using standard equation developed by Streeter and Phelps are to be made and incorporated in the report.
- To prepare a land use map along the bank of the Khal.
- The generated base line data to be statistically analysed.
- To prepare an effluent / waste water management plan which will include besides introduction, background and available history of Khardah Khal and its present status, Industrial set-up in and around the Khal, existing social structure, presentation of base line data, interpretation of physical/chemical/ Biological and Bacteriological data so analysed etc with definite recommendation for mitigation of environmental problems.

**The complete project report is available at the:**

**Library  
West Bengal Pollution Control Board  
Paribesh Bhawan  
10A, Block – LA, Sector – III  
Salt Lake, Kolkata – 700 098**