



BHIWANDI NIZAMPUR CITY MUNICIPAL CORPORATION

NRW REDUCTION STRATEGY

Action plan to reduce water losses to less than 20%

PREAMBLE :

Potable water is becoming scarcer; often making it more energy intensive to procure. More energy is required to pump water to greater distances and from deeper depth in the ground. This alarming situation and ever increasing population has cautioned everybody to conserve the available water resources and adapt oneself to optimum use of available water. The water supply, as an essential commodity, has to be looked upon from demand side as well as supply side. The urban local bodies, which form the supply side, will have to play a vital role in managing this often-scarce resource. As global urbanization continues, they have the complex task of cost effectively providing water to keep cities functioning. Further in the process of improving overall water system efficiency, energy & water consumption have to be viewed as linked inputs rather than viewing them as separate and unrelated. On the other hand, the demand side which consists of consumers have to be made aware of the present situation of the available water resources, necessary habitual changes required to be made by adopting various means of water conservation, optimal use of available water, re-use and re-circulation of waste water for some activities, frequent inspection and rectification of home appliances to reduce leak & wastage, restricted use of appliances requiring more water, etc.

1. EXISTING WATER SUPPLY SYSTEM :

- The existing source of water is surface source . The capacity of the sources is 115 MLD per day . The city is getting 73 MLD water from Ulhas River. The water is treated at Temghar by STEM water authority. The STEM company is supplying water to corporation in bulk way .The Mumbai Corporation is supplying 40 MLD settled water to the corporation .The corporation is giving TCL dose and then supplied to the consumer

.The corporation is supplying 2 MLD treated water from their Varhala lake . Also there are 1750 bore wells in the corporation limits from which approximately 2 ml raw water is supplied.- Considering all the sources i.e. 115 MLD (STEM-73 MLD, BMC – 40 MLD & Underground sources 2 MLD) .

- STEM is supplying water from Temghar Pumping Station to Main Balancing Reservoir having capacity 5.00ML. Treated water is then supplied through Kawad and Kharbav feeder main. Brihan-Mumbai Mahanagarpalika is supplying 40 ML of settled water, after TCL dosing the water is supplied to the consumers through distribution network.
- In Bhiwandi Nizampur City Municipal Corporation , the water is being supplied pipelines and bore wells . There are five numbers of ward committee in the corporation area. For each ward committee separate agency is appointed for day to day maintenance of pipelines and bore wells. There is one another agency is engaged for operating 350 number of valves. The contract is awarded for 1 year .The ward wise maintenance process is controlled by Junior engineer and supervisor in each ward committee. One complaint resolver centre is established and the toll free no are published for citizen Repairing and maintenance of pipe lines and bore wells is being done by own funding of Bhiwandi Nizampur City Municipal corporation.
- The water is being supplied to the consumer to direct pumping in 08 zones and remaining 06 zones are being supplied through elevated reservoirs.
- The total length of water supply distribution pipe lines laid in the city is 301 km
- The total storage capacity in city is 46.65ML. The capacity of elevated reservoirs is 40.45 ml and capacity of ground water reservoirs is 6.20 ml.
- There are total 61971 service connections in BNCCMC area and all of them are unmetered as per details shown in Table below;

Table No 1. Details of House Connections

Category	Number
Total Connections	61971
Domestic Connections	57588
Commercial Connections	4147
Industrial	236

2. NON REVENUE WATER (NRW) :

- **What is Non-Revenue Water (NRW)?**

The difference between the amount of water put into the distribution system and the amount of water billed to customers is known as Non-Revenue Water (NRW). NRW is made up of real losses and apparent losses. Real losses occur in distribution systems, service connections, bursts and storage tanks (including overflow). Apparent loss includes meter and record inaccuracies and unauthorized water uses such as theft and unauthorized connections authorized unmetered uses can also be considered as one of the components of NRW.

- The service level benchmark for NRW is 20%. There is considerable scope for reduction of NRW in almost all cities of the country. Though reduction of NRW is a very big challenge, there have been examples of successful reduction of NRW.

- **Different Elements of NRW Reduction Strategy identified are :-**

- Water Audit & Water Balance
- District Metered Area (DMA)
- Network Mapping
- Leakage Mapping
- NRW Cell
- Capacity Building
- Tariff Structure

3. BNCMC's NRW REDUCTION STRATEGY :

- **NRW Reduction :**

- Setting up correct zones for each ESR / GSR: Operational zones are demarcated with respect to ESR/ GSR's capacity and serviceability.
- Setting up District Metering Areas (DMA): District Metering Areas are set up for each correct operational zone for the number of customers between 500 to 2000. These DMA's shall be made hydraulically discrete (isolated) by carrying out zero pressure tests. Flow into the each DMA shall be metered and

continuously monitored. Also, Pressure Control Valve's (PRV's) shall be installed at more than one point as per the site requirements. Analysis of water flow and pressure, particularly in the night when most users are not drawing water will enable Leakage Specialists to identify leakages and calculate the level of leaks in that particular DMA.

- Detailed survey and investigations of transmission and distribution network shall be carried out. The entire Transmission and Distribution Network shall be mapped by using GIS Mapping tool and this shall facilitate to carry out effective and accurate Hydraulic Modelling of the entire system. Out of the total selected area of distribution pipe network, a few kilometers of pipeline shall be replaced. Thus, after replacement, NRW can be brought down considerably as the pipes will be new with good joint system.
- House service connections: All house service connections shall be replaced by using MDPE pipe. It is a known fact that more than 50% of the leaks appear from Service Connection, old discontinued connections and leaks at ferrule points. Also, the service connections are made of Galvanized Iron (GI) pipes which have effective life of less than 15 years depending upon the soil condition in which it is laid. The age of connections in the maximum BNCMC area is more than 15 years which would mean that many of the service pipes have live their life and need replacement. Thus, this House Service Replacement program will amount to a huge NRW Reduction.
- Bulk and consumer metering: Bulk meters shall be installed with a provision of creating a graph of minimum net night flow V/s. hours by sending SMS to the control room.
- Leak identification: Identify the leakage areas by conducting step tests and gathering data from the data loggers. Exact location of leak spots shall be then fixed using leakage identification instruments such as injection of helium gas, sounding rods, noise-corelator etc.
- NRW reduction: Once the commercial and physical losses are known, measures shall be taken up to bring them in accepted limit.
- Water Balance: Components of water balance such as authorized billed meter consumption, authorized billed unmetered consumption, unauthorized

consumption due to thefts, metering inaccuracies, leakage in transmission mains, distribution house service connection shall be computed and water audit will be carried out.

- Consumer Awareness Programs :
 - BNCMC plans to undertake all measures which shall promote the benefits of project and create public awareness about NRW reduction in water supplies. A separate Public Relation team shall be appointed which will ensure cordial communication between Contractor, BNCMC, Public Representatives, NGOs, consumer forum, Media, other Government Authorities, etc.
 - Internal water audit or leak test for consumers those having history of high consumption shall be conducted. A list of such consumers shall be identified and maintained.
 - Checklist of probable leak points to consumers of DMA's shall be provided as a part of awareness programme.
 - Residents Welfare Association (RWA) / notified societies shall be informed about time table for digging & restoration work within the colony.