ACTION PLAN
FOR
IMPLEMENTATION OF DIRECTIONS OF NATIONAL GREEN TRIBUNAL (NGT)

DELHI JAL BOARD
Govt. of NCT of Delhi

AECOM
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SEWERAGE MASTER PLAN-2031

NCT Delhi has an expanding population that has grown by more than 300% since 1971 when it stood at 4.055 million, increasing to the current level of around 20 million. As per Census 2011, Delhi had a population of 16.753 Million and as per the Delhi Master Plan 2021, the population of Delhi is projected to be 23 Million. Presently, approximately 50% of Delhi is not connected with sewerage system as shown in Figure 1. The wastewater services in next twenty years are likely to worsen drastically unless remedial measures are taken today.

Legend

- SEWERED AREA
- UNSWERED AREA
- GREEN AREA

Figure 1: Sewered & Unsewered area of NCT of Delhi
For the sewerless areas of Delhi, DJB got developed a holistic, integrated and sustainable Master Plan for design horizon of 2031. This master plan shall ensure that the comprehensive, technically and financially viable plans (CAPEX & OPEX) are in place for the implementation of sewerage works in sewerless areas of Delhi by integrating with existing network and sewerage infrastructure so as to bring the latter to their optimum utilization state.

As per SMP-2031, the whole NCT of Delhi has been delineated into 12 (twelve) drainage zones as listed and shown in Figure 2 below:

- Shadara Drainage Zone (SHD)
- Okhla Drainage Zone (OKH)
- Keshopur Drainage Zone (KSP)
- Rohini-Rithala Drainage Zone (RR)
- Coronation Pillar Drainage (COR)
- Dwarka Drainage Zone (DWK)
- Najafgarh Drainage Zone (NJD)
- Nilothi Drainage Zone (NLT)
- Narela Drainage Zone (NRL)
- South Delhi Drainage Zone (SD)
- Outer South Delhi Drainage Zone (OSD)
- Kanjhiwala-Bawana (KB)
The Sewerage Master Plan for design year 2031 (SMP-2031) has been developed by AECOM with the need to lay additional sewerage network of around 10,000 Km. Unserved areas of Delhi has complex situation with congestion and lesser space left for laying the sewerage utility. In view of this, trenchless technology methods such as Microtunnelling and HDD have been proposed for laying new networks as appropriate. As an immediate measure a technologically feasible option has also been considered which is to trap the sewage flowing in the drains from unserved areas by implementing Interceptor Sewer System. This shall cut off untreated sewage contamination in the drains towards river Yamuna. This shall be a short term immediate relief for the betterment of sanitation condition and hence quality of river Yamuna. The master planner, AECOM with inputs of DJB has wisely taken up the proposed infrastructure in the SMP-2031 by integrating with these proposed interceptor sewers. The proposed sewerage schemes under SMP-2031 shall be implemented in various phases as per intended priority over next few years.
Ramifications of SMP will ensure that the comprehensive, techno-economical plans are in place for the implementation of sewerage development and improvement works. Ramifications will also upgrade the sewerage infrastructure leading to improved sanitation conditions and also enhance the water quality in river Yamuna.

**DRAINAGE MASTER PLAN FOR DELHI**

HPT Delhi and National Green Tribunal (NGT) are working jointly on holistic Storm Water Drainage Master Plan of Delhi. The concern of NGT is to ensure that no untreated sewage should flow into storm water drains and thus leading to rejuvenation of these drains. About 201 Storm Water Drains (SWD) have been identified as natural drains as per Drainage Master Plan-1976. Most of them are carrying sewage from sewered and unsewered areas of Delhi and there is a need to provide system to isolate sewage from SWD on immediate basis. It was suggested to prioritize the part of proposed sewerage schemes for immediate implementation to cut off sewage flow in natural SWD.

**APPROACH & METHODOLOGY FOR UNSEWERED AREAS IN DELHI**

Following key activities have been carried out by AECOM to prioritize the part of sewerage scheme proposed under SMP-2031 for immediate implementation to cut off sewage flow in storm water drains:

- Superimposition of 201 natural drains provided by HPT-Delhi, on proposed sewerage schemes under SMP-2031.
- Conceptual analysis of superimposed drains in co-relation with proposed sewerage schemes under SMP-2031.
- Approach for prioritization of part of proposed sewerage networks for immediate implementation works for revival of natural drains.
- Identification and tentative prioritization of proposed sewerage infrastructure comprising Waste Water Treatment Plant (WWTP), Waste Water Pumping Station (WWPS) and associated structures for implementation.
- Estimation of anticipated broad cost for execution of prioritized works as discussed above.

Map showing overall proposed sewerage schemes for unsewered areas of Delhi under SMP-2031 along with superimposed 201 natural drains has been attached. Proposed sewerage schemes for individual drainage zones have been analyzed in co-relation with superimposed natural drains. Tentative prioritization of part of sewerage networks for proposed drainage zones has been carried out and shown as highlighted portion in the maps. The maps are attached and listed below:

1. Superimposed Drains over all proposed sewerage schemes under SMP-2031
2. Map showing tentative prioritization of overall proposed sewerage schemes
3. Shadnam Drainage Zone
4. Okhla Drainage Zone
5. Keshopur Drainage Zone
6. Rohini-Rithala Drainage Zone
7. Coronation Pillar Drainage
8. Dwarka Drainage Zone
9. Najafgarh Drainage Zone
10. Nilotki Drainage Zone
11. Narela Drainage Zone

12. South Delhi Drainage Zone

13. Outer South Delhi Drainage Zone

14. Kanjivaram-Bawana (KB)

Proposed aspects for further consideration toward stipulated objectives of NGT:

- Implementation of sewerage schemes proposed under SMP-2031 has been taken up by DJB at various drainage zones. It is suggested that an option of prioritizing the implementation schedule of contractors for execution of proposed sewerage network to cut off sewage flow in natural drains on immediate basis, can be looked into.

- It is further suggested to execute the prioritized sewerage network of proposed schemes, in the vicinity of area where other schemes are already under implementation by DJB.

- Neighboring states also contributes to the sewage flow in natural storm drains. Thereby it is necessary to take this issue on priority basis in parallel.

SUMMARY OF TENTATIVE PRIORITIZED SEWERAGE NETWORK, WWPS AND WWTP AS PER SMP-2031

- Proposed Sewerage length (Tentative): Approx. 600 km
- Proposed Pumping Stations: 26 Nos.
- Proposed Waste Water Treatment Plant Capacity: 119 MGD (32 Nos.), Capacity Range: 0.6 – 10 MGD

ANTICIPATED BROAD COST

The anticipated broad cost for execution of works prioritized above has been estimated as INR 4,000 Crores (approx.) considering an escalation factor of 8.5% per year for 3 years. The cost has been derived based on aspects as mentioned above and is tentatively only. The actual cost may vary as per detailed engineering/ study to be conducted.

TIMELINES

The proposed sewerage works are likely to be completed in a period of 2 to 3 years from the actual start of the works at site. The implementation of the works where only sewer lines are to be laid can be completed in two years whereas the works involving the construction of WWPS and WWTP, may take three years.

Implementation Schedule for prioritized works:

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DISCLAIMER

The above exercise has been carried out considering the following aspects:

- Superimposition of 201 Natural drains over proposed schemes under SMP-2031 has been carried out based on the data provided by IIT-Delhi.

- Sewerage network prioritized is part of sewerage schemes proposed under SMP-2031 for unsewered areas of Delhi. In view of stipulated objective of NGT, further study may be carried out wherever required, to ascertain re-routing, inclusion/exclusion of proposed networks, hydraulic design as per site feasibility. This may require additional Topographical Survey to be conducted along with GIS integration.

- The cost estimated for prioritized works excludes the cost of sewerage works already under implementation by DJB.

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