COMPLIANCE REPORT
IN THE MATTER OF
ORIGINAL APPLICATION NO. 348/2021 TITLED
PRADEEP KUMAR & ANR.VS UNION OF INDIA & ORS

1.0 BACKGROUND

The Hon'ble NGT in the above said matter vide order dated 04.01.2022 directed as follows:

"4. In view of above, let a joint Committee of CPCB, State PCB, GNIDA, District Magistrate, Gautam Budh Nagar and Secretary, Urban Development, UP to look into the matter and take remedial action. CPCB and the State PCB will be the nodal agency jointly for compliance and coordination. The Committee may meet within two weeks, undertake visit to the site, interact with the stakeholders and ascertain the action plan for remedial action, if any. The action plan may cover septage management, sewerage plant with STP(s). The Committee may also identify the authorities responsible for the failure and action to be taken against the violators/erring authorities. Report may be furnished within two months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF."

2.0 COMPLIANCE TO NGT's DIRECTIONS

In compliance to directions of NGT, UPPCB seeks nomination from concerned Department vide letter dated 13.01.2022 and meeting of the committee was convened on 28.02.2022 to discuss the following:

1. Present status of sewage management in villages highlighted by petitioner and;
2. Action plan of Greater Noida Authority for remedial measures.

Minutes of the meeting is attached as ***Annexure-I***.

Joint inspection of villages was made by the officials of CPCB, UPPCB and Greater Noida Authority (GNIDA) to understand the scale of problem and current practice of sewage management on 01.04.2022***(Annexure-II)***. During the inspections, it was found that Sewerage network was laid down in all villages. For villages where households depend on onsite sanitation systems such as septic tanks for handling wastewater safe septage management option of desludging pointshave been provided. Septic tanks are desludged regularly by desludging trucks and the septage contents gets disposed in faecal sludge receiving points built in the sewer network. Around 35% households have already been connected to the sewerage network and the remaining around 65% households use septic tanks. There is no sewage disposal into the open drains.GNIDA has been providing sewer connection to households in

villages**.**Despite this households have been reluctant in taking up connections. Grey water from households gets discharged into drains leading to ponds. In addition, used water from washing of animals, vehicles and household premises are discharged into the drains.

There are 124 notified villages in Greater Noida. Six villages falls under the jurisdiction of Noida and Ghaziabad and 2 villages are uninhabited.The status of Sewage Management inall the villages within Greater Noida and Action plan is attached as ***Annexure-III***. The status of sewage management is summarized in Table 1 ahead.

Table 1: Status of sewage management in Villages of Greater Noida

Sl. No.	**Number of Villages**	**Status of Sewerage Network**	**Connectivity to STPs**	**Action plan for Remediation**	**Remarks**
1.	35*	Sewerage Network Available in Villages	Village level network connected to STPs. Households reluctant to take sewer connection.	GNIDA has conducted multiple camps. Intensive Information Education Communication(IEC) at Household level is planned.Two NGOs contracted by GNIDA are used for this.	In villages where sewerage network is available, households are reluctant to take sewerage network connections. GNIDA has conducted multiple camps***(Annexure-VI)*** in last two years to encourage households to connect with the network. Despite this, households have not connected their Water Closets to the network as it involves expenditure towards making modifications to
2.	21**	Sewerage Network Available in Villages	Villages have access to desludging points. Village level network not connected to STP.STP is available with sufficient treatment capacity (174 MLD, Inflow 110-120 MLD)	Connectivity of Sewerage System to STP will be completed by the end of 2024	
3.	28#	Sewerage Network Available in Villages	Villages have access to desludging points. Internal lines not	Connectivity of Sewerage System to STP will be completed by the end of 2024	

Sl. No.	Number of Villages	Status of Sewerage Network	Connectivity to STPs	Action plan for Remediation	Remarks
			connected to STP.		existing construction in their household premises. Hence households prefer use of septic tanks.
4.	31##	Sewerage Network Available in Villages	Villages have access to desludging points. Internal lines not connected to STP.	Connectivity of Sewerage System to STP will be completed by the end of 2027	IIT has been engaged to prepare plan for connecting villages to STP.
5.	2	Unihabited villages			
6.	6	Villages falling under Noida-Chaproli Banger, Mohiyapur, Shehdra Villages falling under Ghaziabad-Duda-Heda, Mavai, AkbarpurBahrampur			
7	1	One village has been mentioned twice in the notification			

***,**,#,## List of villages are available in AnnexureIII and Action Plan.**

Status of "critically bad" villages as mentioned in the petition

Details about the sewerage network connection status of all 124 villages in Greater Noida has been discussed in the previous section and the Action plan for all villages is submitted in ***Annexure-III***.In the petition it is mentioned grievance for93 villages has been raised. However, there are only 69 villages listed in the petition and these are mentioned as "critically bad" in the petition. The list includes repetition of names of two villages. Therefore, the details about 67 villages is presented ahead. Internal sewer network is available in all these 67 villages.

Among the 67 villages,

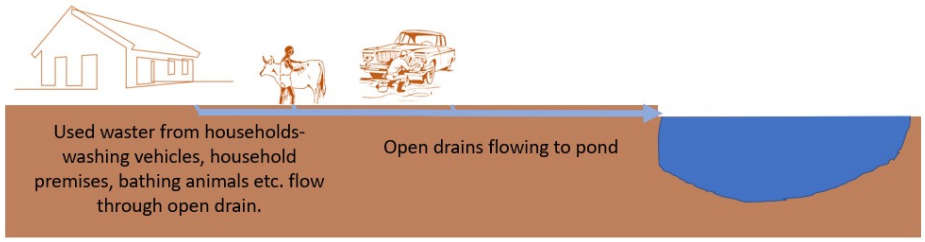
a. 18 villages are already connected with the STP. GNIDA has been providing sewer network connections to households in the villages.As can be seen from the percentage of connections at household level, there is a reluctance from households to take up connections, despite GNIDA's multiple camps. This is because the households do not want to spend on breaking tiled/ cemented surfaces, rooms to put the household level lines.

b. There are 14 villages where the villages are being provided with connections to existing STPs. As an interim measure faecal sludge receiving points are provided in the sewer network in which the septage desludged from the septic tanks in these villages are disposed off safely.
c. There are 35 villages which have internal sewer lines laid. Faecal sludge receiving points are provide in the sewer network in which the septage desludged from the septic tanks in these villages can be disposed off safely.

3.0 FINDINGS

1. Grey water from the households flow into the drains. Grey water generated from washing of animals (including buffalos and dogs), vehicles, andcleaning of household premises also leads to the drains. In addition, buffalo dung which is not managed properly by the households also reach the drains causing major problems to the flow (Relevant pictures in the ***Annexure-V***). Schematic diagram showing disposal of used water from households in drains in attached as Figure 1.

Figure 1: Schematic diagram of used water from households flowing to Ponds through drains

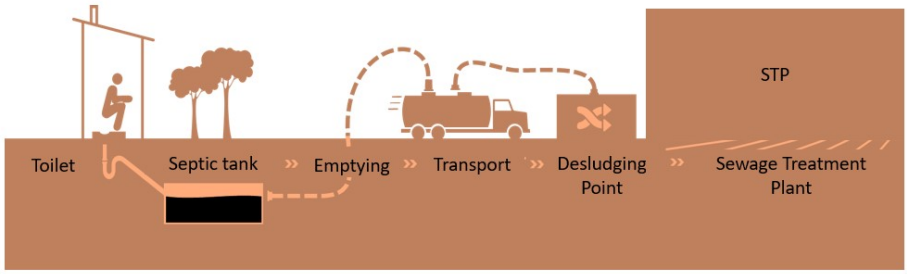


2. The settlements in villages were pre-existing. The villages depend on Onsite sanitation systems like septic tanks for wastewater management. Septage management measures as suggested by MoHUA has been provided for the villages by GNIDA. GNIDA has provided facility for disposal of septage collected by desludging vehicles into the existing sewerage system to enable co-treatment of septage in the STP. There are 16 faecal sludge receiving points ***(Annexure-VI)***constructed in the existing sewerage network which covers all villages within 10km distance as per SBM guideline[1](Map for reference in ***Annexure-VII***). GNIDA has also brought in a process for registering desludging operators and registered

[1]https://www.niti.gov.in/sites/default/files/2021-08/NITI-NFSSM-Alliance-Report-for-digital.pdfhttps://swachhbharatmission.gov.in/SBMCMS/writereaddata/Portal/Images/pdf/brochure/FaecalSludgeManagement.pdf

them (Process and advertisement for registration in ***Annexure-VIII***). The desludging operators have been given multiple trainings on safe handling of septage and provided them with PPE kits by GNIDA (Photos attached in ***Annexure-IX***). The process of septage management is shown in Figure 2.

Figure 2: Schematic diagram of septage management in Greater Noida



3. As part of its phased development GNIDA has included all the villages in its sewerage plan for the city. Consequently, GNIDA has been providing sewer network coverage and connectivity to STP for the villages in a phased manner. Household level connections in villages are provided by GNIDA.
4. All villages have already been provided with internal sewer network. Connectivity of this network with the STP is completed in 35 villages and work is under progress to connect the remaining villages with the STP. Out of these 80 villages, 49 villages shall be connected to STP by 2024.IIT has been requested to prepare plan for connecting remaining villages to STP.
5. There is no shortcoming from GNIDA as it has provided safe septage management options and sewer network coverage and is progressing towards shifting those villages whichdepend on septage management system to sewer network system.

4.0 OBSERVATIONS

As per section 24 of The Water (Prevention and Control of Pollution) Act, 1974, the untreated wastewater should not be discharged into any stream or well or sewer or on land without the consent of State Pollution Control Board. However, in the present case, untreated sewage from 80 villages isbeing managed through safe septage management options. Septage from households is disposed in desludging points built by GNIDA in its sewer network.

The Sewage Management Plan of any ideal city includes connection of all households to sewerage system, conveyance system (includes sewer lines and pumping stations), STP and treatment within prescribed norms. The current status of sewage management of 115 villages of Greater Noida indicates that

sewerage network is available. As per action plan of GNIDA, all villages will have the facility of sewerage system, STPs by the year 2027.
GNIDAhas provided 16 desludging points in which septage from 80 villages is being safely disposed. The data provided by GNIDA shows that wastewater generation in villages varies in the range of 0.5 MLD to 03 MLD.
Considering the hydraulic load of wastewater generated from 80 villages and current grey water management practice, it is proposed that natural decentralized treatment system within the village may be adopted and treated water may be allowed to get discharged into ponds available in village.

Similar concept plan was referred in the judgement dated 05.04.2020 of Hon'ble NGT in the matter of O.A no. 170/2021 titled; NoorulSeharLari Vs State of U.P &ors. Salient features of concept plan are reproduced in next section.

CONCEPT PLAN

With the approach of suggesting the wastewater and septage management for small size village typical of the subject area, it is pertinent to come out with a concept of grey water management with minimum power requirement, low cost and easy manoeuvrability. In specific case of the subject area, the hydraulic and organic load of wastewater, terrain / geography and practices of sewage management, it is recommended that GNIDA should adopt best economical practices of grey water management as per the guidelines / manuals of Ministry of Housing Urban Affairs (MoHUA), Govt. of India.

MoHUA has issued National Policy on Fecal Sludge and Septage Management and manual on Sewerage and Sewage Treatment Systems in cities with less than 1 lakh population. MoHUA guidelines developed under Swachh Bharat Mission are available to ensure that no untreated fecal sludge or used water is discharged into the environment. The used water (including sewerage and septage, grey water and black water) is safely contained, transported and treated, along with maximum reuse. Further, MoHUA has a provision for funding under the following scheme/ interventions:

1. Desludging equipment, for scheduled and need-based desludging of all septic tanks;
2. Interception and diversion of drains (I&D) (including last mile connectivity for nearest sewer network);
3. Construction of Fecal Sludge Treatment plants (FSTPs) for used water treatment.

In view of above facts, sewerage management plan for 80 villages in GNIDA can be formulated with following suggestive approach:

1. To start with, villagers must ensure that the design of septic tank at each households conforming to guidelines of CPHEEO (***Annexure-X***). Such approved designs shall not only provide a basic tool for sewage/septage treatment, but also ensure proper (primary) digestion of fecal sludge/septage as a pre-requisite for its environment friendly disposal.

2. Further, Manual on Sewerage and Sewage Treatment Systems published by Central Public Health and Environmental Engineering Organization (CPHEEO), Ministry of Housing and Urban Affairs, Govt. of India, has envisaged Onsite sanitation system wherein, design of septic tank as per user requirement are defined.

3. Septage waste of septic tank is required to be managed as per National Policy on Fecal Sludge and Septage Management.

4. Regular cleaning of septic tanks through a systematic extraction and collection procedure is essential to check environmental pollution. The frequency of cleaning is determined by the desired performance of the OSS (Onsite sanitation) system for the local conditions.

5. Collected septage waste shall be disposed off into nearby Sewage Treatment Plants (STPs) for further treatment and safe disposal.

6. For treatment of septic tank's combined overflow and other domestic wastewater, Waste Stabilization Pond or Decentralized Wastewater Treatment System (DEWATS) are recommended.

7. The natural Ponds which are typical of the subject area, given its flat(gentle) topography, can be exploited for the purpose of Waste Stabilization.

8. Waste Stabilization Ponds (WSPs) are large, man-made water bodies in which blackwater, greywater or fecal sludge are treated by natural processes under the influence of sunlight, wind, microorganisms and algae . Such ponds can be used individually, or linked in a series for improved treatment. There are three types of ponds, (a) anaerobic, (b) facultative and (c) aerobic (maturation), each with different treatment and design characteristics. WSPs are noted with their low Operation and Maintenance cost and high removal of BOD and

pathogens. However, large surface areas and proper design are a pre-requisite.

9. Another self-driven system (referred in S.No. 06 above), is DEWATS system. This system is recommended for isolated habitations typical of the subject area, where there is a need for non-mechanized and self-operating treatment technology, given the premise that adequate land area is available. This system requires to group the toilets or at least bring the sewage from the various centers to the DEWATS facility. The typical treatment in the facility includes:
    i. Pre-treatment settler: retention time of about 2 hours; BOD reduction by about 30%
    ii. Anaerobic Baffled Tank Reactor: retention time of about 24 hours; BOD reduction by about 80%
    iii. Anaerobic filter: retention time of about 8 hours; BOD reduction by about 90%
    iv. Planted gravel filter: retention time of about 36 hours; BOD reduction by about 90%
    v. Polishing pond

    Specific design details of WSP and DEWATS can be referred (***Annexure-XI)***

10. For the sake of taking reference to operational systems working on the above suggested technological interventions, case study of NeelaHauz and Rajokri Lake in Delhi may be referred, which work principally on DEWATS / WSP system. In both the cases, weak sewage of small region is collected and provided with the treatment through self-driven natural system and treated water is stored in low-lying area to form lake / pond which may be further developed as a recreational facility. Specific details of case study of NeelaHauz and Rajokri Lake also mentioned in CPCB's Published Document (*Report on Alternate Treatment Technologies for wastewater in drains*). Relevant portion of report is attached (***Annexure-XII***)

5.0 RECOMMENDATION

1. To ensure that proper drainage system is available for open drains carrying grey water(washing animals, vehicles and household premises)/ storm water overflow generated in different parts of the town upto the natural ponds designated in the subject area
2. The ponds collecting domestic wastewater from different parts of the subject area may be considered for execution of Conceptual Plan in the First Phase as system of self-driven, low-cost and with least energy input mechanism of sewage treatment. The decentralized system comprising of sewage treatment provided with system (sectors) for anaerobic digestion, gravel-bed-filtration, phyto

remediation and natural oxidation. The final treated waste water stored (in ponds) can be used for recreation by proper landscaping. All the sectors / unit of treatment shall be designed to ensure gravitational flow, thus minimizing use of (electrical) power. A working example similar to the Conceptual Plan proposed above, can be referred at NeelaHauz and Rajokri Lake, Delhi.

3. National Policy on Faecal Sludge and Septage Management and manual on Sewerage and Sewage Treatment Systems of MoHUA may be referred by GNIDA.

4. Interception of storm water drains into main sewerage system so that no untreated sewage should be discharged into Hindon River.

5. Septage Management regulations should be formulated so that illegal discharges into open drainage system can be regulated. District Administration and Police Department should be made aware of the list of desludging point and all aspects of Septage Management.

Dr. Nitin Madan	**Vishal Gandhi,**	**A K Arora**	**Bhuvan**
ADM(E)	**Scientist 'D'**	**G.M(Project),**	**Prakash Yadav,**
GautamBudh	**CPCB**	**GNIDA**	**R.O. UPPCB**
Nagar			**Greater Noida**

27/7/22

27.7.2022

Annexure-I

बैठक में उ0 प्र0 प्रदूषण नियंत्रण बोर्ड, के पत्र संख्या 822/NGT-50/21 दिनांक 17.02.2022 के द्वारा मा0 राष्ट्रीय हरित अधिकरण नई दिल्ली द्वारा ओ0ए0 सं. 348/2021 Pradeep Kumar v/s Union of India & Ors. में पारित आदेश दिनांक 04.01.2022 के अनुपालन में ग्रामों में सीवरेज व्यवस्था एंव नालियों की सफाई कराये जाने के सम्बन्ध बिन्दुओ पर विचार विर्मश किया गया। बैठक की कार्यवाही का विवरण निम्नानुसार है:–

1. बैठक में ग्रेटर नौएडा प्राधिकरण क्षेत्र के गांवों में डाली गई सीवर लाइनों पर विस्तृत चर्चा हुई, जिस पर सभी समिति सदस्यों एवं याचिका कर्ता द्वारा सहमति व्यक्त की गई।
2. समिति को अवगत कराया गया है कि ग्रेटर नौएडा परिक्षेत्र के अन्तर्गत वर्तमान तक 122 ग्रामों में से 35 गांवो को सीवर नेटवर्क से जोड़े जा चुके है तथा आगामी वर्ष 2023 के अन्त तक 17 गांवों को जोडने का लक्ष्य रखा गया है। वर्तमान में इन गांवों में सीवर लाइन डाली जा चुकी है तथा सीवर Desludging point के माध्यम से सीवेज को सीवर लाइन में डालते हुए निस्तारण किया जा रहा है।
3. जिन गाँवों में सीवरेज प्रणाली चालू/Working में नहीं है, वहाँ पर ग्रेटर नौएडा के सम्पूर्ण क्षेत्र को कवर करते हुए Desludging point बनाए गए है, जिसमें Septic tank से निकलने वाले sludge का निस्तारण किया जाता है, जिसको सभी के द्वारा संतोषजनक माना गया।
4. इसके अतिरिक्त 35 और गावों में सीवर लाइन डाल दी गई है तथा इनको वर्ष 2024 तक जोडे जाने का लक्ष्य है और वर्तमान में इन गावों को Desludging point के माध्यम से सीवेज को सीवर लाइन में डालते हुए निस्तारण किया जा रहा है।
5. अवशेष Scattered 35 गांवो के लिए आई0आई0टी0 रूड़की से मास्टर प्लान तैयार करने हेतु अनुबन्धित करने का कार्य किया जा रहा है, जिसके उपरान्त आगणन तैयार कर कार्य कराया जाना प्रस्तावित है।
6. समिति को अवगत कराया गया कि ग्रेटर नोएडा विकास प्राधिकरण द्वारा 03 जनवरी वर्ष 2019 में सीवर कार्यो को क्रियान्वयन करने हेतु, Dedicated वर्क सर्किल–सीवर का सृजन किया गया है, जो पूरे ग्रेटर नौएडा क्षेत्र के समस्त गांवो के सीवर की समस्या का निस्तारण कर रहा है।
7. वर्तमान में संचलित एस0टी0पी0 का आई0आई0टी0 रूड़की द्वारा समय–समय पर निरीक्षण किया जा रहा है।
8. साफ–सफाई से सबंधित कार्मचारियों एवं वाहनों हेतु पोर्टल/वेबसाइट तैयार किया गया है, जिसे ग्रेटर नौएडा प्राधिकरण के पोर्टल पर ट्रैक किया जा सकता है।
9. वाहनों के ट्रैकिंग हेतु GPS का प्रयोग किया जा रहा है, जिसकी स्थिति से अवगत होने हेतु Portal/web पर देखा जा सकता है।
10. 2018 में 02 एस.टी.पी. थे, एवं वर्तमान में 04 एस.टी.पी. (कुल क्षमता 174 एम0एल0डी0) ग्रेटर नौएडा प्राधिकरण द्वारा स्थापित किये जा चुके है। जिसमें अधिकतर 95–100 एम.एल.डी. सीवेज को शुद्धीकृत किया जा रहा है, एवं दिनांक 31.03.2026 तक ग्रेटर नौएडा प्राधिकरण द्वारा 03 और एस. टी.पी. का निर्माण किया जाएगा।
11. समिति द्वारा वर्तमांन में गांवो में किये जा रहे सीवर सम्बन्धी कार्यो का स्थल निरीक्षण किया गया। स्थल निरीक्षण में पाया गया कि कहीं भी घरों का सीवर नाली में नहीं बहाया जा रहा है।
12. प्राधिकरण के माध्यम से एन0जी0ओ0 द्वारा जन जागरूकता हेतु प्रोग्राम भी किये जा रहे है।
13. सभी ग्रामों की गलियों की लगातार सफाई हेतु ग्रामों को 4 जोन में विभाजित किया गया है। 1200 सफाई कर्मी तैनात किये गये हैं, जो कि नालियों की प्रतिदिन सफाई करते हैं।
14. सॉलिड वेस्ट प्लॉस्टिक आदि हेतु 415 डस्टबीन आवश्यकताकनुसार विभिन्न स्थानों पर लगाये गये हैं।
15. क्षेत्रीय कार्यालय, उ0प्र0 प्रदूषण नियन्त्रण बोर्ड द्वारा प्राधिकरण के 4 एस0टी0पी0 का साप्ताहिक निरीक्षण किया जाता है एवं सैम्पल विश्लेषित कराया जाता है एवं River Ganga Monitoring Portal पर साप्ताहिक रूप से एवं केन्द्रीय प्रदूषण नियन्त्रण बोर्ड के E-Track पोर्टल पर त्रैमासिक रूप से अपलोड किया जाता है।

(डॉ0 नितिन मदान) अपर जिलाधिकारी (प्र0) गौतमबुद्ध नगर।	(विशाल गांधी) वैज्ञानिक–डी केन्द्रीय प्रदूषण नियन्त्रण बोर्ड, नई दिल्ली।	(ए0 के0 अरोड़ा) महाप्रबन्धक ग्रेटर नौएडा औद्योगिक विकास प्राधिकरण, ग्रेटर नौएडा।	(भुवन प्रकाश यादव) क्षेत्रीय अधिकारी उ0प्र0 प्रदूषण नियन्त्रण बोर्ड, ग्रेटर नौएडा।

Annexure- II

मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली में योजित ओ0ए0 सं0 348/2021 प्रदीप कुमार बनाम यूनियन ऑफ इण्डिया व अन्य में पारित आदेश दिनांक 04.01.2022 के अनुपालन में ग्रेटर नोएडा औद्योगिक विकास प्राधिकरण के क्षेत्रान्तर्गत ग्रामों में सीवरेज व्यवस्था की निरीक्षण आख्या–

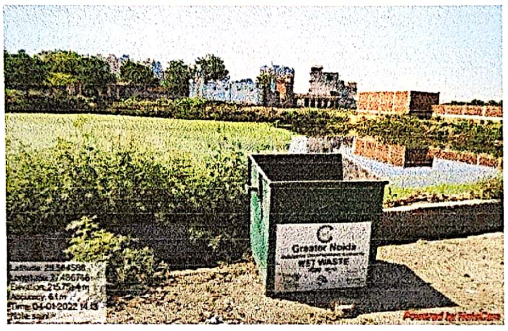
मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली में योजित ओ0ए0 सं0 348/2021 प्रदीप कुमार बनाम यूनियन ऑफ इण्डिया व अन्य में पारित आदेश दिनांक 04.01.2022 के अनुपालन में केन्द्रीय प्रदूषण नियंत्रण बोर्ड, ग्रेटर नोएडा औद्योगिक विकास प्राधिकरण एवं उ0प्र0 प्रदूषण नियंत्रण बोर्ड की संयुक्त समिति द्वारा दिनांक 01.04.2022 को ग्राम रायपुर बांगड़, डाबरा, सैनी, वेदपुरा, सदुल्लापुर का निरीक्षण किया गया।

1. निरीक्षण के समय ग्राम रायपुर बांगड़ में ग्रेटर नोएडा औद्योगिक विकास प्राधिकरण द्वारा सीवेज कनेक्शन स्थापित किया जा चुका है। ग्राम निवासियों द्वारा अवगत कराया गया कि कनेक्शन दो माह पूर्व में किया गया, परन्तु उसे मुख्य सीवरेज नेटवर्क से नहीं जोड़ा गया है। फोटोग्राफ निम्नवत है–

2. ग्राम डाबरा में ग्रेटर नोएडा औद्योगिक विकास प्राधिकरण द्वारा सीवेज कनेक्शन स्थापित किया जा चुका है, परन्तु निरीक्षण के समय ग्रामों की नालियाँ चोक होकर ओवरफ्लो होती हुई पायी गयी। फोटोग्राफ निम्नवत है–

3. ग्राम सैनी के निरीक्षण के समय ग्रामवासियों एवं याचिकाकर्ता द्वारा अवगत कराया गया कि ग्रेटर नोएडा औद्योगिक विकास प्राधिकरण द्वारा सीवेज कनेक्शन स्थापित किया गया है, परन्तु सीवरेज कनेक्शन को मुख्य लाइन से कनेक्ट नहीं है तथा ग्रामों से निकलने वाले सीवेज पास में स्थित तालाब में मिलता है, जोकि तालाब को अत्यधिक गंदा कर रहा है। साथ ही तालाब के पास डस्टबिन रखी गयी है। फोटोग्राफ निम्नवत है–





4. ग्राम वेदपुरा निवासियों द्वारा अवगत कराया गया कि ग्राम की सभी नालियाँ चोक है, जिससे नालियों का सीवेज ओवरफ्लो होकर सड़को पर फैलता है। निरीक्षण के समय ग्राम में स्थित तालाब की स्थिति अत्यधिक प्रदूषित थी, जिसमें पूर्ण रूप से कूड़ा–कचरा भरा पाया गया है। फोटोग्राफ निम्नवत है–




5. ग्राम सदुल्लापुर में निरीक्षण के समय सीवेज पास के स्थित तालाब में नालियों के माध्यम से तालाब में मिलता हुआ पाया गया। प्राधिकरण के कर्मचारी द्वारा अवगत कराया गया कि तालाब की सफाई नियमित रूप से की जाती है तथा घरेलू कचरे हेतु प्राधिकरण द्वारा डस्टबिन भी रखी गयी है। फोटोग्राफ निम्नवत है–

ग्राम सैनी, वेदपुरा एवं सदुल्लापुर में स्थित तालाबों का जल नमूना दिनांक 06.04.2022 को एकत्रित कर प्रयोगशाला में विश्लेषण हेतु जमा किया गया है। विश्लेषण आख्याऐं अपेक्षित हैं।

ग्रेटर नोएडा औद्योगिक विकास प्राधिकरण के अनुसार ग्रेटर नोएडा क्षेत्रान्तर्गत कुल 122 ग्रामों में से 35 ग्रामों को सीवर नेटवर्क से जोड़ा जा चुका है, 17 ग्रामों को दिनांक 31.08.2022 तक सीवर नेटवर्क से कनेक्ट किया जाना है, 35 गांवों को 31.03.2023 तक सीवर नेटवर्क से कनेक्ट किया जाना है तथा शेष 35 गांव हेतु सीवर की व्यवस्था के लिए आई0आई0टी0 रूड़की से अनुबन्ध कर मास्टर प्लान तैयार किया जा रहा है। ग्रामों में सीवर की समस्या के निस्तारण के लिए डी–स्लजिंग प्वाइंट स्थापित किये गये है।

BP Yadav
6/4/2022

(विशाल गाँधी)
वैज्ञानिक–डी
केन्द्रीय प्रदूषण नियंत्रण बोर्ड
नई दिल्ली

(भुवन प्रकाश यादव)
क्षेत्रीय अधिकारी
उ0प्र0 प्रदूषण नियंत्रण बोर्ड
ग्रेटर नोएडा

Annexure-III

Action Plan for Management of Sewage in Villages of Greater Noida

Sr. No.	Name of village	Population			Present Waste water generation (In MLD)	Faecal sludge receiving point	Sewerage Network	Status of connectivity of Sewer Line to STP	Action Plan With Timeline
		2011	As on 2021	Future 2031					
	Villages Connected to STP								
Sl. No.	**Name of village**								
1	Aichcher	1155	2888	7219	0.39	Yes	Yes	Yes	----------
2	Begampura	500	1250	3125	0.17	Yes	Yes	Yes	----------
3	Bironda	836	2090	5225	0.28	Yes	Yes	Yes	----------
4	Birondi Chaksenpur	1345	3363	8406	0.45	Yes	Yes	Yes	----------
5	Birondi tajpur	1250	3125	7813	0.42	Yes	Yes	Yes	----------
6	Chuhardhpur khadar	321	803	2006	0.11	Yes	Yes	Yes	----------
7	Dabra	2393	5983	14956	0.81	Yes	Yes	Yes	----------
8	Dadha	3089	7723	19306	1.04	Yes	Yes	Yes	----------
9	Fathepur Rampur	1700	4250	10625	0.57	Yes	Yes	Yes	----------
10	Brahmpur Gajrola (Nawada)	1725	4313	10781	0.58	Yes	Yes	Yes	----------
11	Ghodi Bacheda	7902	19755	49388	2.67	Yes	Yes	Yes	----------
12	Gurjarpur	558	1395	3488	0.19	Yes	Yes	Yes	----------

13	Habibpur	3425	8563	21406	1.16	Yes	Yes	Yes	----------
14	Haldoni	2125	5313	13281	0.72	Yes	Yes	Yes	----------
15	Haldona	120	300	750	0.04	Yes	Yes	Yes	----------
16	Jaitpur Vaishpur	975	2438	6094	0.33	Yes	Yes	Yes	----------
17	Jalpura	2996	7490	18725	1.01	Yes	Yes	Yes	----------
18	Junpat	1967	4918	12294	0.66	Yes	Yes	Yes	----------
19	Kyampur	1011	2528	6319	0.34	Yes	Yes	Yes	----------
20	Khanpur	2396	5990	14975	0.81	Yes	Yes	Yes	----------
21	Kulesra	3820	9550	23875	1.29	Yes	Yes	Yes	----------
22	Lakhnawali	1800	4500	11250	0.61	Yes	Yes	Yes	----------
23	Malakpur	2600	6500	16250	0.88	Yes	Yes	Yes	----------
24	Mubarakpur	1838	4595	11488	0.62	Yes	Yes	Yes	----------
25	Mathurapur	279	698	1744	0.09	Yes	Yes	Yes	----------
26	Namoli	271	678	1694	0.09	Yes	Yes	Yes	----------
27	Nawada	3867	9668	24169	1.31	Yes	Yes	Yes	----------

28	Rampur Jagir	365	913	2281	0.12	Yes	Yes	Yes	----------
29	Raypur Banger	1796	4490	11225	0.61	Yes	Yes	Yes	----------
30	Sadopur	3729	9323	23306	1.26	Yes	Yes	Yes	----------
31	Sakipur	6500	16250	40625	2.19	Yes	Yes	Yes	----------
32	Sirsa	1947	4868	12169	0.66	Yes	Yes	Yes	----------
33	Soorajpur	8241	20603	51506	2.78	Yes	Yes	Yes	----------
34	Suthiyana	6485	16213	40531	2.19	Yes	Yes	Yes	----------
35	Tugalpur	2052	5130	12825	0.69	Yes	Yes	Yes	----------
	Villages which will be connected to STP by end of 2024								
36	Accheja	4876	12190	30475	1.65	Yes	Yes	No	Estimate for Pipe Laying for connecting of Village with STP in progress. Septic tank exists in village. Desulging point for disposal of sewage to STP available.
37	Hazaratpur	250	625	1563	0.08	Yes	Yes	No	Balance main sewer line connection work will done by jal Nigam Intimation given by GNIDA to Jal nigam. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
38	Kasna	7800	625	1563	0.08	Yes	Yes	No	Proposal for Village connection to stp of village kasna in progress Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
39	Rithori	2812	7030	17575	0.95	Yes	Yes	No	Estimate for Pipe Laying for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
40	Ajayabpur	373	933	2331	0.13	Yes	Yes	No	Estimate for Pipe Laying for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
41	Gulistanpur	2052	5130	12825	0.69	Yes	Yes	No	Main sewer line damaged by DFCCIL intimation send by GNIDA

42	Ghangola	1677	4193	10481	0.57	Yes	Yes	No	Proposal for DPR preparation Under process for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
43	Ladpura	4315	10788	26969	1.46	Yes	Yes	No	Proposal for IPS in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
44	Maycha	5123	12808	32019	1.73	Yes	Yes	No	Proposal for IPS in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
45	Chamrawali Bodaki	2728	6820	17050	0.92	Yes	Yes	No	Proposal for DPR preparation Under process for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
46	Makoda	7023	17558	43894	2.37	Yes	Yes	No	Proposal for DPR preparation Under process for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
47	Palla	2592	6480	16200	0.87	Yes	Yes	No	Proposal for DPR preparation Under process for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
48	Pali	3789	9473	23681	1.28	Yes	Yes	No	Proposal for DPR preparation Under process for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
49	Thapkheda	1709	4273	10681	0.58	Yes	Yes	No	Proposal for DPR preparation Under process for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
50	Imaliyaka	2529	6323	15806	0.85	Yes	Yes	No	Balance sewer line tender in process. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
51	Luksar	2302	5755	14388	0.78	Yes	Yes	No	Balance sewer line tender in process. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
52	Amkka	1176	2940	7350	0.40	Yes	Yes	No	Proposal for DPR preparation by IIT Roorkee Under process for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
53	Jone Samana	1750	4375	10938	0.59	Yes	Yes	No	Estimate for Pipe Laying for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
54	Rupwas	2795	6988	17469	0.94	Yes	Yes	No	Proposal for DPR preparation by IIT Roorkee Under process for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
55	Aimnabad	1239	3098	7744	0.42	Yes	Yes	No	Tendering work in progres. Septic tank exists. Time to time tanker is used for disposal of sewer.
56	Bisrakh Jalapur	5470	13675	34188	1.85	Yes	Yes	No	Tendering work in progres. Septic tank exists. Time to time tanker is used fordisposal of sewer.

57	Chapraula	1935	4838	12094	0.65	Yes	Yes	No	DPR Under sanction for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
58	Chipyana Bujurg	3250	8125	20313	1.10	Yes	Yes	No	Tendering work for construction of stp in progress.
59	Chipyana Khurd	2265	5663	14156	0.76	Yes	Yes	No	Tendering work for construction of stp in progress.
60	Haibatpur	2056	5140	12850	0.69	Yes	Yes	No	Tendering work for construction of stp in progress.
61	Ithera	1903	4758	11894	0.64	Yes	Yes	No	Tendering work for construction of stp in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.
62	Yusufpur (Chak Shahveri)	2051	5128	12819	0.69	Yes	Yes	No	Tendering work in progres. Septic tank exists. Time to time tanker is used for disposal of sewer.
63	Milak Lachhi	2307	5768	14419	0.78	Yes	Yes	No	Tendering work in progres. Septic tank exists. Time to time tanker is used fordisposal of sewer.
64	Patvari	3745	9363	23406	1.26	Yes	Yes	No	Tendering work in progres. Septic tank exists. Time to time tanker is used fordisposal of sewer.
65	Roja Jalalpur	4350	10875	27188	1.47	Yes	Yes	No	Tendering work in progres. Septic tank exists. Time to time tanker is used fordisposal of sewer.
66	Roja Yakubpur	4275	10688	26719	1.44	Yes	Yes	No	Tendering work for construction of stp in progress.
67	Baidpura	1195	2988	7469	0.40	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
68	Bhanota	1683	4208	10519	0.57	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
69	Bhola Rawal	1215	3038	7594	0.41	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
70	Devla	2832	7080	17700	0.96	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
71	Dhum Manikpur	10388	25970	64925	3.51	Yes	Yes	No	Proposal for DPR preparation by IIT Roorkee Under process for connecting of Village with STP in progress. Septic tank exists in village. Desludging point for disposal of sewage to STP is available.

72	Kheda Chauganpur	2275	5688	14219	0.77	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
73	Khedi	3812	9530	23825	1.29	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
74	Khirpur Gurjar	3684	9210	23025	1.24	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
75	Khodna Kala	2193	5483	13706	0.74	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
76	Khodna Khurd	2193	5483	13706	0.74	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
77	Kirachpur	985	2463	6156	0.33	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
78	Sadullapur	5112	12780	31950	1.73	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
79	Saini	4155	10388	25969	1.40	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
80	Shahveri	6800	17000	42500	2.30	Yes	Yes	No	Tendering work for construction of stp in progress.
81	Sunpura	2672	6680	16700	0.90	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
82	Tilapta Karnivas	8378	20945	52363	2.83	Yes	Yes	No	Proposal for 20 mld STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
83	Tusiyana	1884	4710	11775	0.64	Yes	Yes	No	Proposal for 20 MLD STP in KP- 5forwarded for approval. Septic tank esixts. Desludging points are provided in the sewage network to ensure co-treatment of septage.
84	Murshadpur	336	840	2100	0.11	Yes	Yes	No	Tendering work for construction of STP in progress.

	Villages which will be connected to STP by 2027								
Sr. No.	**Name of village**	**Population**			**Present Waste water generation (In MLD)**	**Faecal sludge receiving point**	**Sewerage Network (Internal)**	**Status of connectivity of Sewer Line to STP**	**Action Plan With Timeline**
		2011	**As on 2021**	**Future 2031**					
85	Ajampur gadhi	361	903	2256	0.12	Yes	Yes	No	Septic tank exists in villages. Desulging point for disposal of septage collected from Household to STP is available.Proposal for DPR preparation by IIT Roorkee Under process for connecting of Village with STP.
86	Amarpur	1150	2875	7188	0.39	Yes	Yes	No	
87	Aminabad (Nyana)	893	2233	5581	0.30	Yes	Yes	No	
88	Astoli	1694	4235	10588	0.57	Yes	Yes	No	
89	Atai Muradabad	1661	4153	10381	0.56	Yes	Yes	No	
90	Baghpur	1275	3188	7969	0.43	Yes	Yes	No	
91	Bilashpur	2835	7088	17719	0.96	Yes	Yes	No	
92	Bishaych	865	2163	5406	0.29	Yes	Yes	No	
93	Chachula	965	2413	6031	0.33	Yes	Yes	No	
94	Chirsi	1152	2880	7200	0.39	Yes	Yes	No	
95	Dadupur Dankaur	3687	9218	23044	1.24	Yes	Yes	No	
96	Dalergardh	2136	5340	13350	0.72	Yes	Yes	No	
97	Daudpur	965	2413	6031	0.33	Yes	Yes	No	
98	Devta	1514	3785	9463	0.51	Yes	Yes	No	
99	Girdharpur	1887	4718	11794	0.64	Yes	Yes	No	
100	Hatewa	1759	4398	10994	0.59	Yes	Yes	No	
101	Junedpur	1550	3875	9688	0.52	Yes	Yes	No	

102	Kanarsi	1356	3390	8475	0.46	Yes	Yes	No	
103	Kheri Hafizpur	1350	3375	8438	0.46	Yes	Yes	No	
104	Kulipura	1100	2750	6875	0.37	Yes	Yes	No	
105	Jaitpur	875	2188	5469	0.30	Yes	Yes	No	
106	Nanwa ka Rajpur	1661	4153	10381	0.56	Yes	Yes	No	
107	Pachaytan Inayatpur	851	2128	5319	0.29	Yes	Yes	No	
108	Pipelka suratpur	1725	4313	10781	0.58	Yes	Yes	No	
109	Powari	851	2128	5319	0.29	Yes	Yes	No	
110	Raghunathpur	325	813	2031	0.11	Yes	Yes	No	
111	Rampur Manjra	1588	3970	9925	0.54	Yes	Yes	No	
112	Ronni	879	2198	5494	0.30	Yes	Yes	No	
113	Roshanpur	1785	4463	11156	0.60	Yes	Yes	No	
114	Salampur Gurjar	4553	11383	28456	1.54	Yes	Yes	No	
115	Taldaa	2250	5625	14063	0.76	Yes	Yes	No	

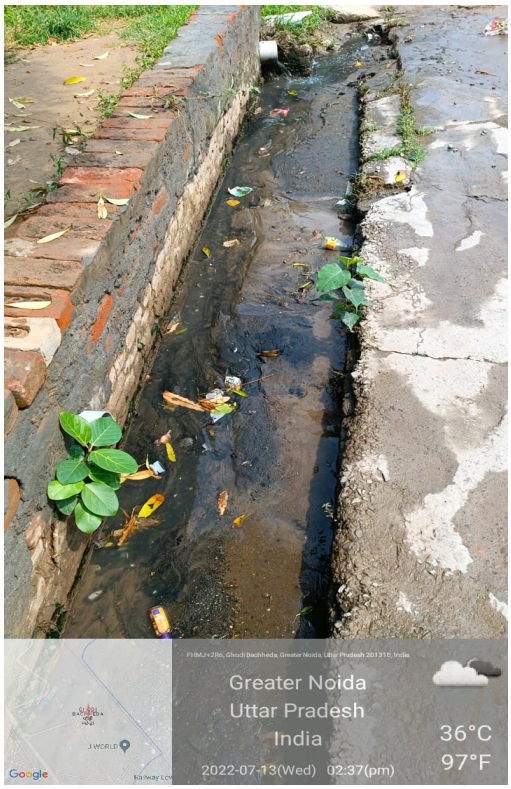
Villages Without Population		
116	Rohillapur	No Population
117	Rasulpur Ray	No Population
Village under Noida & Ghaziabad Jurisdiction		
118	Chaproli Banger	Noida
119	Mohiyapur	Noida
120	Shehdra	Noida
121	Duda-Heda	Ghaziabad
122	Mavai	Ghaziabad
123	Akbarpur Bahrampur	Ghaziabad

Annexure-IV

Camps conducted by GNIDA to encourage households to connect with sewerage network

Annexure-V

Cow dung flowing in drains and Buffalo being bathed- water flows into drains

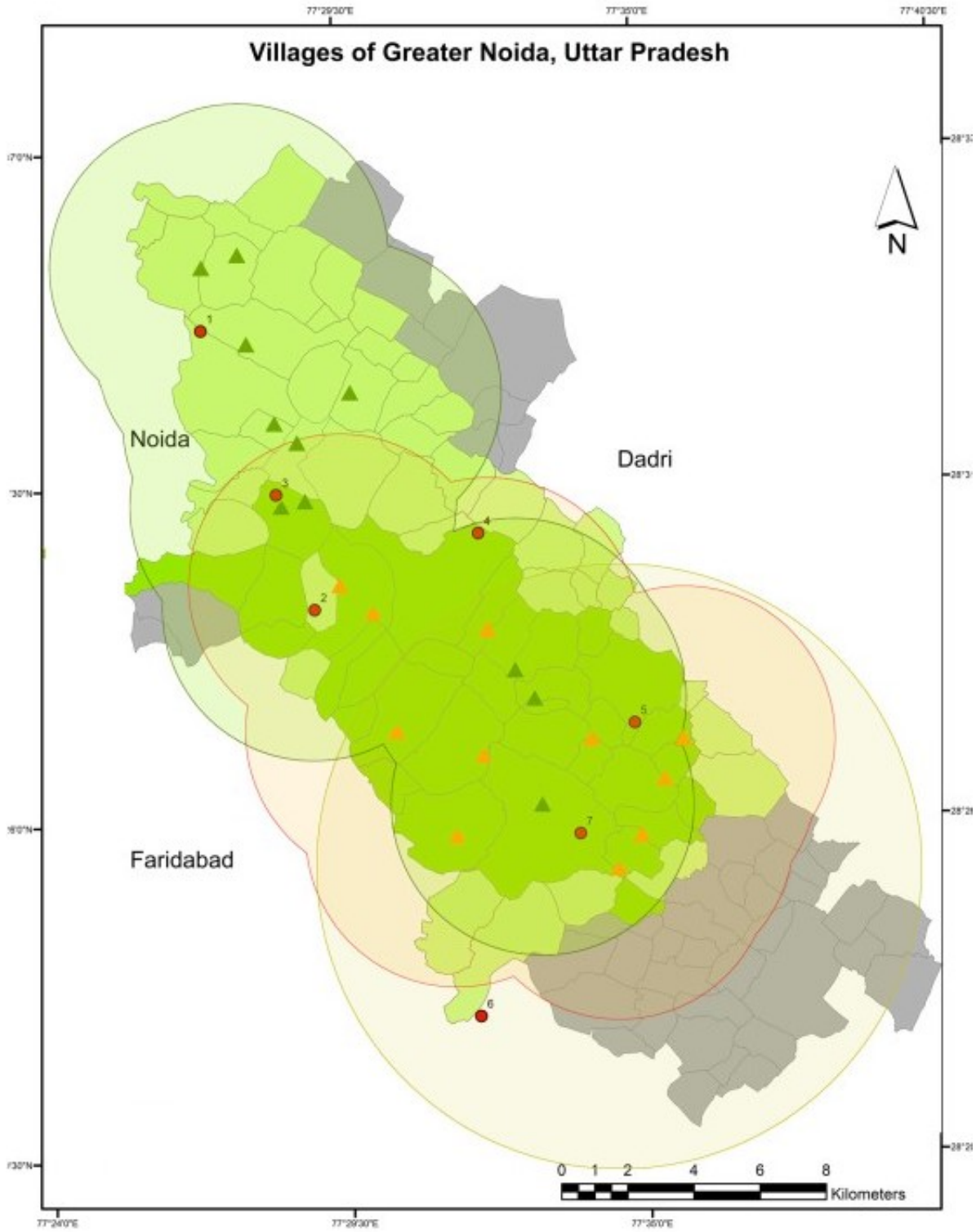


Annexure-VI

Faecal sludge receiving points built in Sewer network

Annexure-VII

Coverage of villages by faecal sludge receiving points (within 10 kms) provided in sewer network in Greater Noida



Annexure-VIII

Advertisement seeking registration of desludging operators in Greater Noida

7/8/2020

अमर उजाला

ग्रेटर नौएडा औद्योगिक विकास प्राधिकरण

प्लॉट नं.-1, नॉलेज पार्क-IV, ग्रेटर नौएडा सिटी, गौतमबुद्धनगर

वेबसाइट : www.greaternoidaauthority.in, ई-मेल : authority@gnida.in

सार्वजनिक सूचना

Ref:Project/WC-Sewer/2020/443 दिनांक: 04.08.2020

स्वच्छ भारत मिशन एवं ग्रेटर नौएडा को स्वच्छ एवं सुन्दर बनाये जाने हेतु ग्रेटर नौएडा प्राधिकरण के अर्न्तगत कार्य करने वाले समस्त सैप्टिक टैंक खाली करने वाले वाहनों का पंजीकरण किया जाना अनिवार्य है। इस हेतु सीवर निस्तारण को आवश्यक सेवा मानते हुए उनके सुनियोजित निस्तारण हेतु सीवर ट्रैक्टर मालिकों को इस शर्त के साथ अनुमति दी जाऐगी कि वह प्रतिवर्ष रू. 6000/– प्रति टैंकर/मशीन का एडवांस प्राधिकरण में जमा करायेंगे एवं निर्धारित सीवर पम्पिंग स्टेशन पर ही सीवर टैंकर खाली करेंगे। ग्रेटर नौएडा प्राधिकरण क्षेत्र के अर्न्तगत कार्य कराये जाने वाले समस्त सीवर टैंकर/ट्रैक्टर का पंजीकरण मुल्य रू. 10/– के शपथ पत्र के साथ विज्ञाप्ति प्रकाशित होने के एक सप्ताह के अन्दर श्रीपाल सिंह, वरिश्ठ प्रबन्धक (सीवर), ग्रेटर नौएडा प्राधिकरण के कार्यालय में अनिवार्य रूप से करा लें। दिनांक 31.08.2020 के बाद यदि कोई पंजीकृत ऑपरेटर प्राधिकरण क्षेत्र में कार्य करता हुआ पाया जाता है, तो उसके विरूद्ध कठोर कार्यवाही अमल में लायी जायेगी।

महाप्रबन्धक (परियोजना)

Follow Us On / OfficialGNIDA

7/8/2020

देवबन्धु

ग्रेटर नौएडा औद्योगिक विकास प्राधिकरण

प्लॉट नं.-1, नॉलेज पार्क-IV, ग्रेटर नौएडा सिटी, गौतमबुद्धनगर

वेबसाइट : www.greaternoidaauthority.in, ई-मेल : authority@gnida.in

सार्वजनिक सूचना

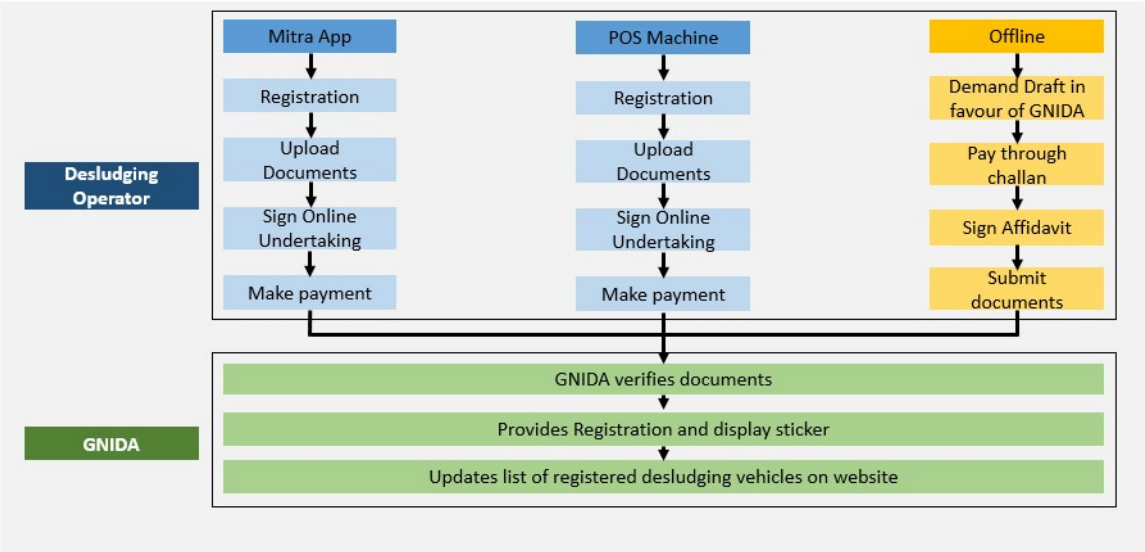
Ref:Project/WC-Sewer/2020/443 दिनांक: 04.08.2020

स्वच्छ भारत मिशन एवं ग्रेटर नौएडा को स्वच्छ एवं सुन्दर बनाये जाने हेतु ग्रेटर नौएडा प्राधिकरण के अर्न्तगत कार्य करने वाले समस्त सैप्टिक टैंक खाली करने वाले वाहनों का पंजीकरण किया जाना अनिवार्य है। इस हेतु सीवर निस्तारण को आवश्यक सेवा मानते हुए उनके सुनियोजित निस्तारण हेतु सीवर ट्रैक्टर मालिकों को इस शर्त के साथ अनुमति दी जाऐगी कि वह प्रतिवर्ष रू. 6000/– प्रति टैंकर/मशीन का एडवांस प्राधिकरण में जमा करायेंगे एवं निर्धारित सीवर पम्पिंग स्टेशन पर ही सीवर टैंकर खाली करेंगे। ग्रेटर नौएडा प्राधिकरण क्षेत्र के अर्न्तगत कार्य कराये जाने वाले समस्त सीवर टैंकर/ट्रैक्टर का पंजीकरण मुल्य रू. 10/– के शपथ पत्र के साथ विज्ञाप्ति प्रकाशित होने के एक सप्ताह के अन्दर श्रीपाल सिंह, वरिश्ठ प्रबन्धक (सीवर), ग्रेटर नौएडा प्राधिकरण के कार्यालय में अनिवार्य रूप से करा लें। दिनांक 31.08.2020 के बाद यदि कोई पंजीकृत ऑपरेटर प्राधिकरण क्षेत्र में कार्य करता हुआ पाया जाता है, तो उसके विरूद्ध कठोर कार्यवाही अमल में लायी जायेगी।

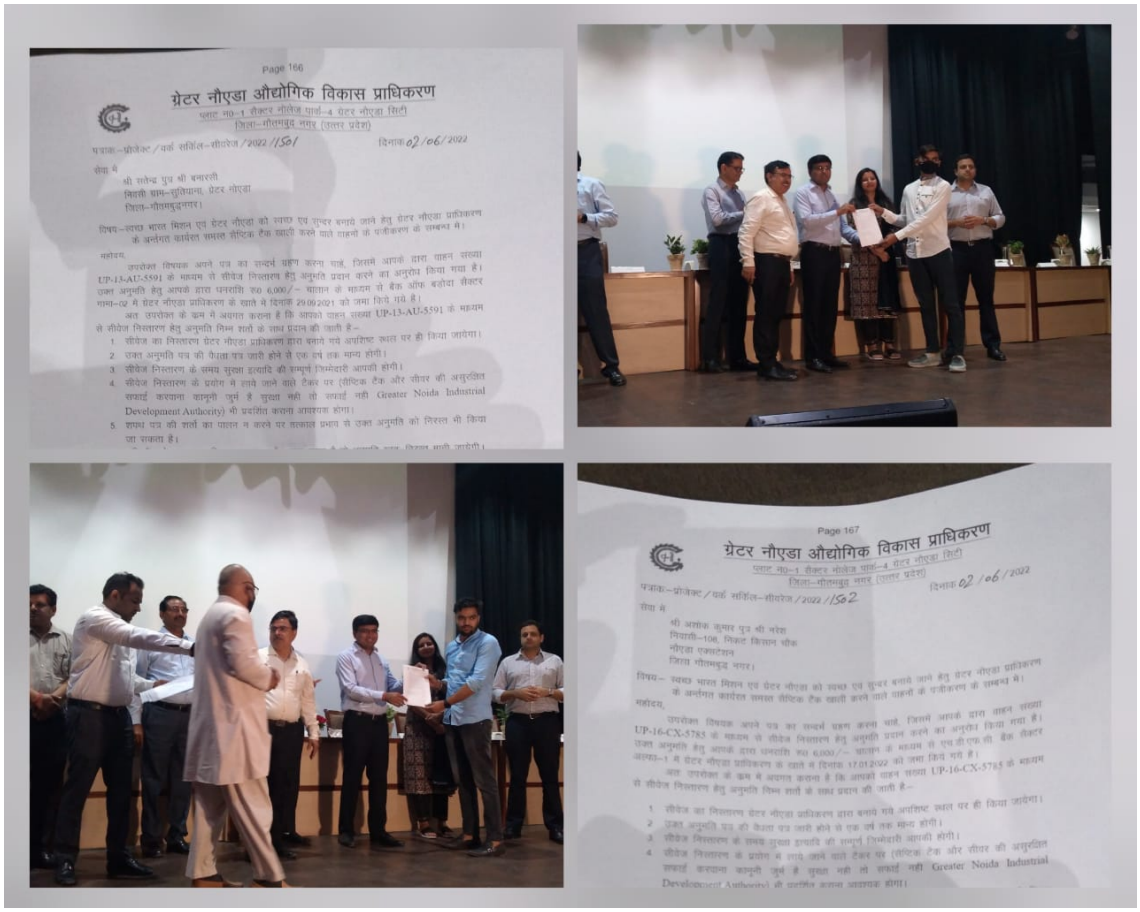
महाप्रबन्धक (परियोजना)

Follow Us On / OfficialGNIDA

Process for registration of desludging operators in Greater Noida



Distribution of Registration Certificates



Annexure-IX

Training for Desludging operators

Distribution of PPE Kit

डी-स्लजिंग वेंडर को पीपीई किट बांटी

जासं, ग्रेटर नोएडा: ग्रेटर नोएडा को स्वच्छ बनाने के लिए प्राधिकरण की कोशिश जारी है। इसी कड़ी में स्लज को टैंकर से एसटीपी तक पहुंचाने वाले डी-स्लजिंग वेंडर को जागरूक करने के लिए सेक्टर ईकोटेक-3 स्थित 20 एमएलडी एसटीपी पर कार्यशाला का आयोजन किया गया। वेंडरों की सुरक्षा के मद्देनजर प्राधिकरण के प्रबंधक पीपी मिश्र ने पीपीई किट भी मुहैया कराई। कार्यशाला में पीडीबैक फाउंडेशन की तरफ के प्रतिनिधि संजय शुक्ला ने वेंडरों को खुले में स्लज न बहाने को कहा। इससे होने वाले रोगों के बारे में जानकारी दी। उनको उन स्थानों पर ही स्लज डालने के लिए शपथ भी दिलाई गई। उन्हें बताया कि स्लज को प्राधिकरण की तरफ से बनाए डी-स्लजिंग प्वाइंट में ही डाला जाए।

सत्यमेव जयते

MANUAL ON SEWERAGE AND SEWAGE TREATMENT SYSTEMS

PART A: ENGINEERING

THIRD EDITION - REVISED AND UPDATED

MINISTRY OF URBAN DEVELOPMENT, NEW DELHI
http://moud.gov.in

CENTRAL PUBLIC HEALTH AND ENVIRONMENTAL ENGINEERING ORGANIZATION

IN COLLABORATION WITH

JICA

JAPAN INTERNATIONAL COOPERATION AGENCY

NOVEMBER 2013

CHAPTER 9: ON-SITE SANITATION

9.1 OVERVIEW OF ON-SITE SANITATION

The areas that are not served by piped sewer systems can adopt on-site systems. The treatment can be either on-site or off-site like in the case of septage management. These are interim measures till a decentralised or a full sewerage system is implemented.

It is strongly recommended that the town planning agencies / authorities / ULB / metropolitan development authorities earmark adequate spaces for laying of sewer lines, construction of SPS and STP.

9.1.1 On-site Sewage Treatment System

Unlike off-site centralized treatment (sewerage), on-site sewage treatment features individual and distributed treatment. The on-site treatment system includes a wide range of facilities, such as a basic sanitation facility like a pit latrine, a simple sewage treatment system that consists of a septic tank and a soak pit for anaerobic treatment, and an advanced facility like Johkasou that treats sewage by sophisticated methods.

In an urban area with high population density, an STP intensively treats sewage collected by pipes laid over a wide area. The on-site system treats sewage near the source.

Accordingly, the latter uses various kinds of treatment technologies according to treatment scale and the surrounding conditions. Sludge generated in each on-site treatment facility is collected and treated separately.

9.1.2 On-site Classification

This subsection summarizes the classification of toilets and on-site treatment methods as well as their features.

9.1.2.1 Historical

The historical pit latrines are rather rudimentary sanitation facilities atleast serving to contain the spread of faecal organisms from the night soil and bringing about interactions between soil organisms and feacal organisms in the pit. These have since been upgraded to various types as in Figure 8.3. In respect of community toilets, installations such as Dewats have also come up.

9.1.2.2 Simple Treatment Method

A septic tank system is a typical on-site treatment facility that consists of a septic tank and a soak pit and employs two technologies: the first is anaerobic treatment and the second is the methods of letting treated sewage penetrate the ground.

It shows stable performance, provided that the water temperature is kept suitable to digestion and the soil has good permeability.

However, the septic tank reduces BOD up to 50%, so if underground penetration is impossible due to high groundwater levels, rocky strata, non-availability of land for soak-pit, another method must be employed to hygienically treat sewage passing through the septic tank such as anaerobic filter and contact aeration. When this system is applied to an urban area with high population density, care must be taken not to have a negative effect on the surrounding environment.

9.1.2.3 Advanced Treatment System

Conventional septic tanks system, if properly designed and with proper septage removal frequency can effectively remove about 40-50% BOD and 50-70% TSS. However, due to partial treatment and associated health hazards the effluent can only be discharged into soak pits. Due to recent groundwater pollution related episodes, unavailability of space for soak pits and under rocky strata, soak pits are avoided and the effluent is commonly discharged to open stormwater drains. Hence, it is causing another type of pollution menace such as unsightly conditions, eutrophication, odour, vector and water related diseases.

Some of the interim solutions are the improved design of septic tanks such as anaerobic baffled reactor or the post treatment of septic tank effluents by anaerobic filters. Both configurations can partially solve the pollution related problems by increasing the overall BOD removal to more than 70%. These systems can lessen the burden of organic pollution without any extra energy cost. The capital cost of these systems may not be more than 20-30% of the conventional septic tank cost. Nevertheless, due to the limitation of anaerobic sewage treatment, these systems cannot bring down the BOD and TSS levels up to the national effluent discharge standards. Hence, alternate solution could be the aerobic type post treatment such as contact aeration. This system can bring down effluent BOD to less than 30 mg/l and TSS to less than 50 mg/l but at the expense of electrical power requirement for 24×7 operating air blower with standby equipment and standby power.

One such system is the Japanese type Johkasou system. This system is an integrated septic tank-anaerobic filter-contact aeration-final settling tank and effluent disinfection facility. However, due to higher cost considerations, these systems may be affordable only in very fragile environment. These systems have also been upgraded for even nitrogen removal by providing internal recirculation. The detail of these systems is provided in the following sections. There are many other similar package treatment systems elsewhere that can also be used.

9.2 THE PROHIBITION OF EMPLOYMENT AS MANUAL SCAVENGERS AND THEIR REHABILITATION ACT, 2013

The aforesaid act was notified by the GOI in September 2013. The act shall come into force from 6th December 2013. The text of the act as in the Gazette is in Appendix A 1.1. The time frame specified under the Act for the fulfilment of responsibilities and carrying out certain activities are mentioned in Appendix A 1.2.

9.3 INTERIM MEASURES

There are various on-site systems which can be used but with a caution to prevent ground water and surface water pollution due to indiscriminate disposal of sewage from these on-site systems.

9.3.1 Public and Community Toilets

A public toilet, a kind of common toilet installed in stations and on streets, is open to everyone rather than specified users. In contrast, a community toilet has limited users such as residents. These common toilets are controlled by local governments, residents, or private sector organizations. A common toilet normally has two sections: one is for males and the other is for females. In addition, another section special to persons in a wheelchair (unisex) is sometimes provided.

In general, an on-site common toilet includes a special sewage treatment facility such as a septic tank. The flow rate of sewage to be treated is derived from the total number of users based on how many toilet bowls are installed and how frequently they are used.

The toilet is equipped with a water supply unit, a ventilator, and a lighting device. Figure 9.1 shows example arrangements of faeces, urine, and hand-washing units.

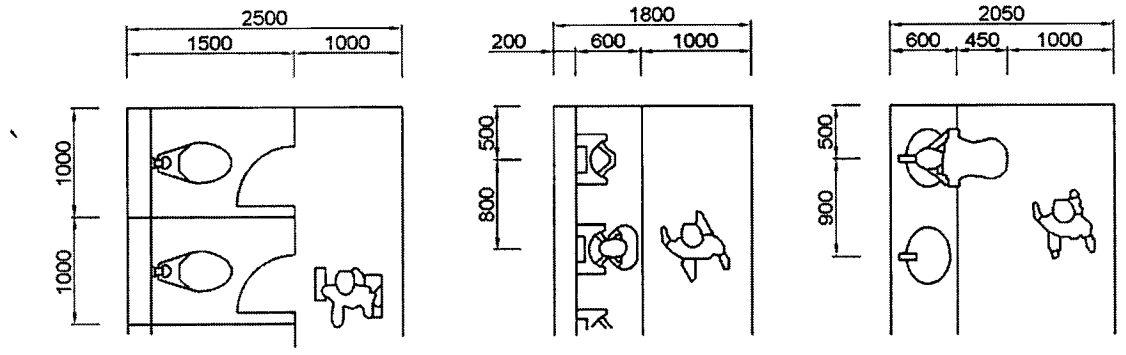


Figure 9.1 Examples of common toilet arrangements

Example of design

The following shows an example of estimating the number of public toilet users.

Basic Setting

Number of toilet bowls [c]: 10 (in total)

Total number of users [n]

$$n = 16c$$
$$= 16 \times 10 = 160$$

9.3.2 Mobile Toilet

Mobile toilets are temporarily installed in places where there is no toilet, such as shelters during natural disaster, venues for events, and construction sites, or where the number of existing toilets is short. A mobile toilet box has a tank for storing excreta in its lower part. If the tank is full, a vacuum tanker collects the stored sewage. Each toilet has a single room or multiple rooms with a hand washing unit, which is selected according to the flexibility of installation sites and ease of transport by a truck. In addition, there is a mobile flush toilet that is equipped with a water tank and a pedal.

Stepping on the latter activates a manual pump to cause washing water to flow. The box is made by assembling fiberglass-reinforced plastic (FRP) side panels, so its weight is light. Local governments keep these toilets to prepare for disasters and events, or rental companies lease them. The mobile toilet features easy installation work on the ground. Figure 9.2 shows a mobile toilet having faeces, urine, and hand washing units.

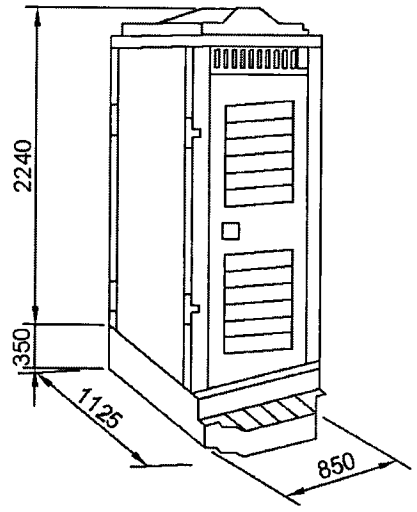


Figure 9.2 Mobile toilet

9.3.3 Pour Flush Water Seal Latrine

In a conventional water flush latrine, the excreta is normally flushed with 10 to 14 litres of water from a cistern. In a pour flush latrine, as the name suggests, excreta is hand flushed by pouring about 1.5 to 2.0 litres of water. These pour-flush leaching pit latrines were first developed in India in mid-forties with a single leach pit and squatting pan placed over it. When the pit in use gets filled up another pit is dug and the squatting slab is removed and placed over the new pit. The first pit is covered with earth and the excreta is allowed to digest. After one or two years, the digested excreta is used as manure.

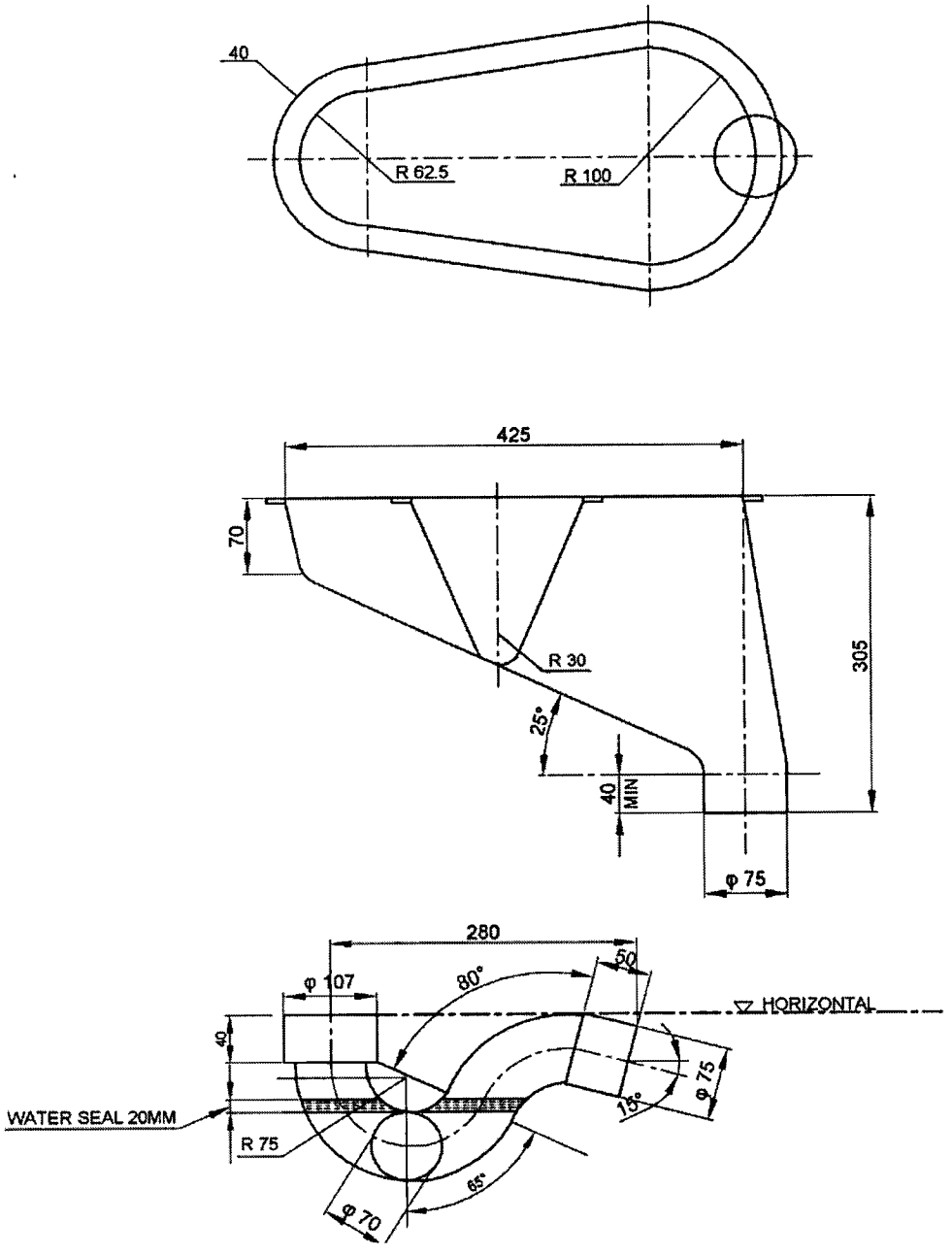
In the late fifties, a modified design of the system was developed. In this system the leach pit is kept away from the seat instead of placing it underneath the pan. In a single pit system, desludging has to be done almost immediately after the pit has been filled up to enable its re-use; this involves handling of fresh and undigested excreta containing pathogens which is a health hazard. Single leach pit is appropriate only if it is desludged mechanically by a vacuum tanker. To overcome this shortcoming, the twin-pit design was introduced and in this case when one pit is full, the excreta is diverted to the second pit. The filled up pit can be conveniently emptied after 1.5 to 2 years, when most of the pathogens die off. The sludge can safely be used as manure. Thus the two pits can be used alternately and perpetually.

With simple care, pour-flush water-seal latrine is a very satisfactory and hygienic sanitation system and hence it can be located inside the house since the water-seal prevents odour and insect nuisance from the pit.

9.3.3.1 Design and Materials

9.3.3.1.1 Squatting Pan, Trap, Footrests, and Connecting Drain

The squatting pan is of special design with steep bottom slope 25 - 28° and a trap having 20 mm water seal set on a cement concrete floor. The hydraulic design of the pan is such that the human excreta can be flushed by pouring only 1.5 to 2 litres of water. The squatting pan and trap design details are shown in Figure 9.3.



Source: CPHEEO, 1993

Figure 9.3 Squatting pan and trap

The squatting pan can be of ceramic or glass reinforced plastic (GRP), High Density Polyethylene (HDPE) or Poly Vinyl Chloride (PVC), Polypropylene (PP), Cement mosaic or even concrete. The squatting pan is connected to the leaching pit through a trap and a pipe or covered drain. The design and material details for latrine units squatting pan, trap, footrest and the connecting drain are summarised below in Table 9.1.

Table 9.1 Material and other details for latrine unit

No.	Squatting Pan	Trap	Footrests	Connecting Drain
1	Horizontal length of pan should be at least 425 mm and longitudinal bottom slope 25 -28°	It should be 70 to 75 mm with 20 mm water seal	It should be 250×125 mm with 15 to 20 mm height	May be non-pressure pipes of PVC minimum 75 mm dia
2	Material: Ceramic, FRP, PP, HDPE, PVC, Cement mosaic or Cement concrete	Fibre Glass, Ceramic, HDPE or CC traps	Ceramic or concrete with mosaic finish brick or stone	Bricks or stone semi-circular bottom
3	Should conform to IS: 2556 (Pt. III), IS: 11246, GRP Sq. Pan	Should conform to IS: 2556 (Pt. XIII)	Should conform to IS: 2556 (Pt. X)	Slope should be 1 in 5 to 1 in 15 as per site conditions
4	(A)			(B)

(A)- Ceramic, FRP, PP are smooth and require less water for flushing. FRP cheaper, lighter and easier to transport than the other

(B)- The inlet pipe should project 100 mm in to the leach pit.A junction chamber of 250×250 mm should be provided in case of pipe

Source: CPHEEO, 1993

9.3.3.1.2 Leach Pits/Twin Pit Latrine

Leach pits serve a dual function of (a) storage and digestion of excreted solids and b) infiltration of the waste liquids and are therefore, to be designed on the basis of the following parameters:

- Sludge accumulation rate
- Long term infiltration rate of the liquid fraction across the pit soil interface
- Hydraulic loading on the pit
- Minimum period required for effective pathogen destruction
- Optimal pit emptying frequency.

9.3.3.1.2.1 Sludge Accumulation Rate

The sludge accumulation rate is a function of a wide range of variables including water table level, pit age, water and excreta loading rates, microbial conditions in the pit, temperature and local soil conditions and the type of material used for anal cleansing.

The leach pit is classified as wet or dry depending on whether the ground water table is above the bottom of pit or below. In dry pits, the pit volume needed is calculated on the basis of solids accumulation rate, but in wet pits though the sludge accumulation rate is lower - the sludge digestion rate is high in the presence of water, yet volume of pit has to be increased to prevent flooding due to surcharge of pits. The sludge accumulation rates given below in Table 9.2 may be used to calculate the pit volume.

Table 9.2 Sludge accumulation rates

Material used for anal cleansing	Effective Volume in m^3 per Capita per Year (A)		
	Pit under dry conditions	Pit under Wet conditions	
		With successive desludging intervals	
		2 years	3 years
Water	0.04	0.095	0.067
Soft Paper	0.053	0.114	0.080

(A) Effective Volume is the volume of the pit below the invert level of pipe or drain.

Source:CPHEEO, 1993

9.3.3.1.2.2 Long Term Infiltration Rate

On account of clogging of soil pores around the leach pits, the long term infiltration capacity (after clogging) of the soil is always less than the natural percolative capacity. The recommended design values of the long term infiltrative capacity can be derived for the typical soil conditions as given below in Table 9.3.

Table 9.3 Long term infiltration rates of different types of soils

No.	Soil type	litres / sqm / day
1	Sand	50
2	Sandy loam, loams	30
3	Porous silty loams, porous silty, silty clay loams	20
4	Compact silty loams, compact silty clay loams, clay	10

Source: CPHEEO; 1993

9.3.3.1.2.3 Hydraulic Loading

The hydraulic loading rate is the total volume of liquids entering the leach pit and is expressed in litres per day although it is often more convenient to consider per capita loadings (litres per capita per day). For computing the pit hydraulic loading, sewage contribution of 9.5 litres per day per person, including water used for ablutions and flushing, urine, excreta, etc., can be taken as the basis.

The outer surface area (perimeter) of the pit from pit bottom to invert level of pipe or drain is to be considered for infiltration. The pit bottom is not taken into account as it gets clogged in course of time. The infiltration area required is the total flow in the pit per day divided by the long term infiltrative rate of the soil where pits will be located. The infiltrative area of leach pits, sized on the basis of sludge accumulation rate should conform to the computed infiltrative area.

9.3.3.1.2.4 Pathogen Destruction

After a period of almost all pathogens viruses, bacteria, protozoa and helminths die off in the leach pit or in the surrounding soil, but not Ascaris Lumbricoides (the large human round-worm) particularly if the leach pit is wet. After about one or one and a half years of storage in the pit, it may not be hazardous to handle the contents of the pit for use as manure.

9.3.3.1.2.5 Optimal Pit Emptying Frequency

The minimum acceptable design interval between successive manual desludging of each twin leach pit could be one-and-a-half-years. However, to provide a reasonable degree of operational flexibility, it is desirable to provide three years storage volume in urban areas and two years in rural areas.

9.3.3.1.2.6 Size of Pits

Sizes of leach pits, [designed as above for different number of users, using water ablution and for different subsoil water levels], with 3 years sludge storage volume, are in Table 9.4.

Table 9.4 Size of leach pits

	5 Users		10 Users		15 Users	
	Dia	Depth(A)	Dia	Depth(A)	Dia	Depth(A)
Dry Pits	900	1,000	1,100	1,300	1,300	1,400
Wet Pits	1,000	1,300	1,400	1,400	1,600	1,500

Note: (A) Depth from bottom of pit to invert level of incoming pipe or drain (all dimensions in mm)

Source: CPHEEO, 1993

The surface area of these is adequate for soils with long term infiltrative rate down to 20 l/m^2/day. The above depths should be increased by 300 mm to provide a free board depth of pit from invert level of pipe or drain to bottom of pit cover.

9.3.3.1.2.7 Design of Pits under Different Conditions

A typical pour flush latrine with circular pits is shown in Figure 9.4.

In water logged area: The pit top should be raised by 300 mm above the likely level of water above ground level at the time of water logging. Earth should then be filled well compacted all round the pits up to 1.0 m distance from the pit and up to its top. The raising of the pit will necessitate raising of latrine floor also. A typical pour flush latrine in water logged areas is shown in Figure 9.5.

In high subsoil water level: Where the subsoil water level rises to less than 300 mm below ground level, the top of the pits should be raised by 300 mm above the likely subsoil water level and earth should be filled all round the pits and latrine floor raised as stated above. A typical pour flush latrine with leach pits in high subsoil water level is shown in Figure 9.6

In rocky strata: In rocky strata with soil layer in between, the leach pits can be designed on the same principle as those for low subsoil water level and taking the long term infiltrative capacity as 20 $l/m^2/d$. However, in rocks with fissures, chalk formations, old root channels, pollution can flow to very long distances; hence these conditions demand careful investigation and adoption of pollution safeguards as stated in paragraph below.

In black cotton soil: Pits in black cotton soil should be designed taking infiltrative rate of 10 $l/m^2/d$. However a vertical fill (envelope) 300 mm in width with sand, gravel or ballast of small sizes should be provided all round the pit outside the pit lining.

Where space is a constraint: Where circular pits of standard sizes cannot be constructed due to space constraints, deeper pit with small diameter (not less than 750 mm), or combined oval, square or rectangular pits divided into two equal compartments by a partition wall may be provided. In case of combined pits and the partition wall should not have holes. The partition wall should go 225 mm deeper than the pit lining and plastered on both sides with cement mortar. A typical pour flush latrine with combined pits is shown in Figure 9.7

Design example of leach pit is given in Appendix A.9.1.

9.3.3.2 Construction of Pour Flush Latrine

9.3.3.2.1 Squatting Pan and Trap

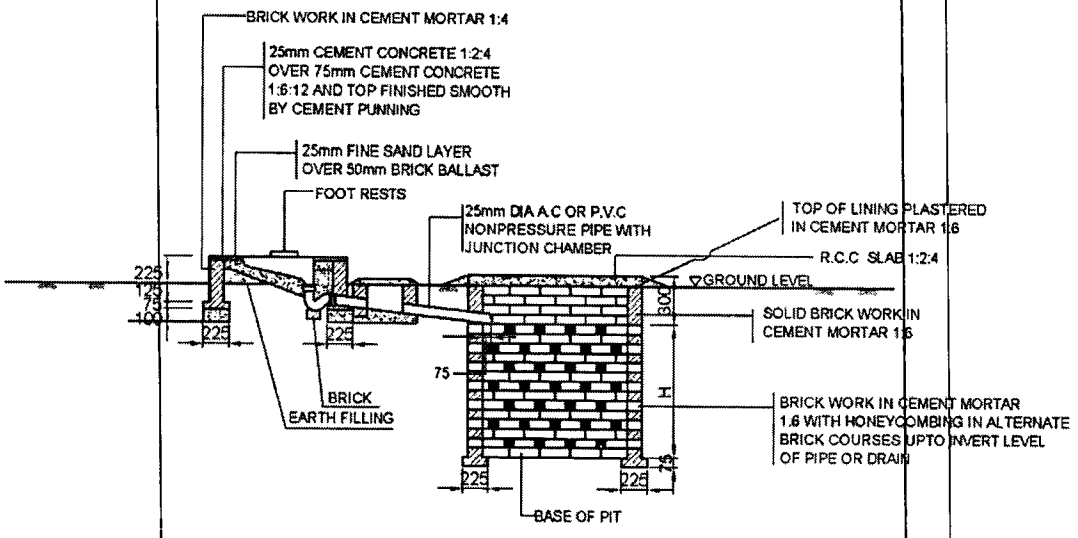
The pan could be ceramic, GRP, PVC, PP, Cement Concrete or Cement Mosaic. Ceramic are the best but costliest. Mosaic or cement concrete pans have the advantage that these can be manufactured locally by trained masons but the surface tends to become rough after long use. Their acceptance is less compared to other types. Traps for ceramic pans are made of the same material but in case of GRP pans, HDPE traps are used. For mosaic pans, traps are of cement concrete.

9.3.3.2.2 Foot Rests

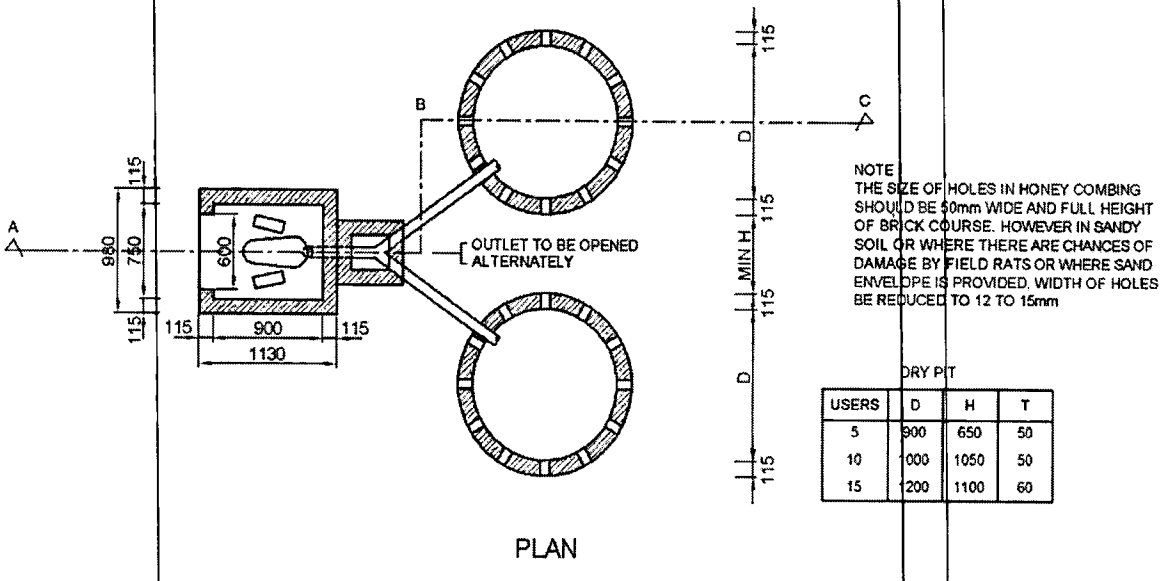
These can be of ceramic, cement concrete, cement mosaics or brick plastered. The top of the footrest should be about 20 mm above the floor level and inclined slightly outwards in the front.

9.3.3.2.3 Pit Lining

The pits should be lined to avoid collapsing. Bricks joined in 1:6 cement mortar are most commonly used for lining. Locally manufactured bricks should be used wherever available. Stones or laterite bricks cement concrete rings could also be used depending upon their availability and cost. However, for ease of construction, use of concrete rings will be advantageous where the subsoil water level is above the pit bottom.



SECTION A B C



DRY PIT

USERS	D	H	T
5	900	650	50
10	1000	1050	50
15	1200	1100	60

PLAN

Source: CPHEEO, 1993

Figure 9.4 Pour flush latrine with circular pits

8.9 RECOMMENDATIONS

The decentralization concepts and technologies in sewage management need to be systematically investigated, with focus on its development and practical implementation in India. It may be borne in mind that the approach adopted for decentralized sewage management system (DSMS) is area specific and governed by number of issues and conditions prevailing, and also the methodology adopted and is influenced by (i) technical aspects as covered in this chapter and (ii) financial aspects, (iii) social aspects, (iv) environmental aspects, and (v) legal aspects that will be covered in the part C of the manual. It needs to be realized that this aspect and programme of decentralized sewerage is what the country needs urgently if the MDG is to be achieved especially in the peri-urban, rural and outlying areas and habitations. Accordingly, the following recommendations are brought up in deciding on implementing this.

1) As Incremental Sewerage - Decentralized Sewerage has an enormous significance by way of incremental sewerage and sanitation especially in newly developing peri-urban and rural settings, where conventional sewerage needs time to qualify itself physically and financially.

2) As a Combination of Collection System Options - It is the interim period from start of the layout to such time that underground conventional sewerage will qualify itself that is the bane of all environmental hazards of indiscriminate pollution. Ingenuity of a combination of decentralized collection systems and incremented treatment capacity of the STP are the remediations for the country as a whole.

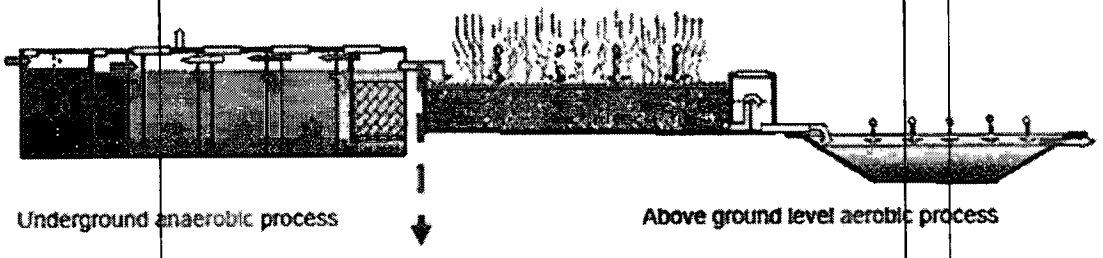
3) Public Acceptance is the Key - However, with the mindset of the people that sewerage de facto implies only to the underground conventional sewerage, any deviation from a conventional system will require a public acceptance before implementation and as such, decentralized sewerage is not an exception. The Srirangam case study is an ideal example. Any attempt in starting a decentralized treatment there would have never seen the light of the day. This aspect must not be underestimated and hence, the public consultation process shall be announced well in advance in local media and repeated one more time giving notice of at least two weeks and making the venue as local marriage hall or public hall with adequate space and hired chairs and expenses being met by the local body. The technicalities are to be toned down and the benefits and costs alone need to be cited elaborately and the opinion elicited. Understandably, it will not be a full acceptance by all the habitation and there will be various cost recovery models thrown up for example, built-up area based on; number of families based, history of residence in terms of years, economically weaker sections, clusters, non-commercial Vs. commercial occupancies, etc., and these are to be debated to bring the issues on hand to a reasonable level of acceptance. The exercise needs to be repeated for a second time. At the end, if a consensus is reached, the project can be considered forward and if it still eludes, the best is pose a conventional sewerage system to JnNURM and await its turn.

4) Design of Collection System - With regard to design procedures of the collection systems, the Manning's formula holds good whether it be a circular conduit or a drain.

5) Design of Treatment Plants - With regard to treatment, the guidelines in Chapter 5 will however, apply as it becomes appropriate to each location.

8.8 DEWATS

This is an abbreviation of Decentralized Wastewater Treatment System (DEWATS) and has been assigned to a typical system of sewage treatment and resource utilization for greening in isolated habitations. The generalized treatment sequence is shown in Figure 8.14.



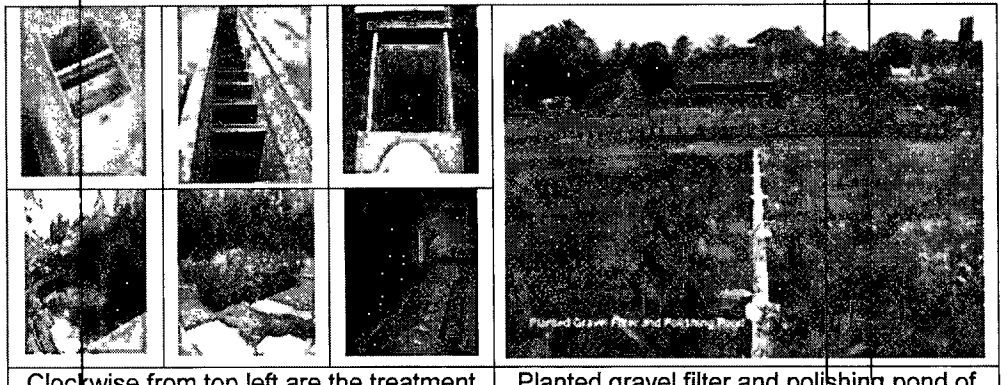
Source: ISPIRATION webpage

Figure 8.14 Schematic treatment process of DEWATS technology

This system is addressed to isolated habitations, where there is a need for non-mechanized and self-operating treatment technology given the premise that adequate land area is available and at reasonable distance from the habitation itself. Another aspect will be to group the toilets or at least bring the sewage from the various centres to the Dewats facility. The typical treatment units are:

a) Pre-treatment settler: retention time of about 2 hours; BOD reduction by about 30%
b) Anaerobic Baffled Tank Reactor: retention time of about 24 hours; BOD reduction by about 80%
c) Anaerobic filter: retention time of about 8 hours; BOD reduction by about 90%
d) Planted gravel filter: retention time of about 36 hours; BOD reduction by about 90%
e) Polishing pond.

These have been installed and commissioned in quite a few habitations in India and a compilation of the facility at the earthquake ravaged place of Bhuj in Gujarat is shown in Figure 8.15. The treatment process has its advantage of not dependant on mechanized units but requires relatively large areas away from the habitation and vector propagation control in the planted gravel filters and ponds.



Clockwise from top left are the treatment units as listed above	Planted gravel filter and polishing pond of an Ayurvedic resort

Source: ISPIRATION webpage

Figure 8.15 Typical DEWATS treatment plant components

ALTERNATIVE TREATMENT TECHNOLOGIES FOR WASTEWATER TREATMENT IN DRAINS

In Compliance to Direction of Hon'ble NGT in the Matter of OA No. 06/2012 Titled Manoj Mishra Vs Union of India & ORS

February, 2020

CENTRAL POLLUTION CONTROL BOARD, DELHI

7. CHALLENGES WITH APPLICATION OF ALTERNATIVE BIOLOGICAL TREATMENT TECHNOLOGY

- Application of any *in-situ* bioremediation of wastewater requires obstruction wall (check dam / weir) to slow down the velocity of flowing water. Any flowing wastewater in storm water drains carry huge volume of floating material (solid waste, plastic waste etc.) and silt. Such obstruction to slow down of the velocity of wastewater results in trapping of floating material and deposition of silt.
- Siltation of drains will result in ponding of wastewater in upstream of such structures that may also result in flooding of upstream areas. Therefore, provisions must be made for regular removal and proper disposal of deposited silt. Floating matter collected also need to be disposed off in scientific manner.
- Spacing between the gabions need to be cleaned on regular basis as it may get choked with silt and floating materials.
- Efficiency decrease in monsoon due to high flow.
- It needs regular harvest of biomass and cleaning of physical filters.
- Difficult to operate when depth of water in drain is more than three feet.
- Slow process as compared to conventional treatment.
- Not effective in backwater, flood water from river on high tides.

8. CASE STUDIES ON DIFFERENT ALTERNATIVE TREATMENT TECHNOLOGIES

Case studies of some of the wastewater interception, diversion and treatment facilities based on alternative treatment technologies namely constructed wetland, soil biotechnology, oxidation pond, trickling filter and aerated lagoon are as under:

8.1 Constructed Wetland

a) Constructed wetland has been established at Neela Hauz lake near Sanjay Van by Centre for Environmental Management of Degraded Ecosystems (CEMDE), Delhi University in collaboration with DDA. The lake is fed by discharge from drain having 01 MLD flow. The constructed wetland effectively results in 90% reduction in BOD and has resulted in restoration of the Neela Hauz lake which was practically dead due to high pollution load. The project was started in November, 2016 and is currently in operation; it was constructed at a cost of Rs. 10 lakhs and requires annual harvest of dead biomass and annual cleaning of physical filters and removal of sludge from oxidation ponds.

b) In-situ constructed wetland system at Rajokari water body was installed by Irrigation and Flood Control Department, Delhi with a project cost of Rs. 77.19 lakhs. The water body is fed by a drain having flow of 600 KLD. There is 84% reduction in BOD in the water body post construction of the wetland. The wetland is currently in operation.

c) Ex-situ remediation for water body rejuvenation through Phytorid technology developed by CSIR-NEERI. This project has been implemented Pan India in 300 sites and is currently in operation in all the sites. The cost of the project was Rs 2.2 crore per