

SUBMITTED BEFORE HON'BLE NATIONAL GREEN TRIBUNAL (NGT)
SOUTHERN BENCH, CHENNAI

Original Application No 199 of 2021 (SZ)
& I. A No. 96 of 2022 (SZ)

In the matter of

Sri Shankar Narayana Bala Krishna & Ors

..... Applicant (s)

Versus

State of Telangana & Ors

..... Respondent (S)

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Date: 26.09.2024.

Place: Chennai



Counsel for 3rd Respondent

H.D. Varalaxmi
H.D.VARALAXMI
Regional Director
CENTRAL POLLUTION CONTROL BOARD
Regional Directorate (Chennai)
MoEF & CC, Govt. of India
2nd Floor, 40-E, BSNL Building, TVK Industrial Estate,
CIPET Road, Guindy, Chennai - 600032

**ACTION TAKEN REPORT IN COMPLIANCE TO HON'BLE NGT ORDER
DATED 15/07/2024 IN ORIGINAL APPLICATION NO. 199 OF 2021 (SZ) & I.A NO
96 OF 2022 (SZ) IN THE MATTER OF SRI SHANKAR NARAYANA BALA
KRISHNA, TELANGANA AND ORS. VS STATE OF TELANGANA REP BY ITS
CHIEF SECRETARY, HYDERABAD AND ORS**



CENTRAL POLLUTION CONTROL BOARD
(Ministry of Environment, Forest & Climate Change)
“Parivesh Bhawan”, East Arjun Nagar,
Delhi-110032

26th September, 2024

1.0. BACKGROUND

Hon'ble NGT vide order dated 15.07.2024 in O.A No 199 of 2021 & I A No 199 of 2022 (SZ in the matter of Sri Shankar Narayana Bala Krishna, Telangana and Ors. Vs State of Telangana rep by its Chief Secretary, Hyderabad and Ors. has directed in para 10 & para 11, which represented as under:

Para 10 "It is high time for the GHMC and CPCB to stop the blame game, find an appropriate solution in a time –bound manner and treat the capped area.

Para 11 "Having waited so far, we request the Chairperson of the CPCB to convene a meeting with the concerned experts constituted by the head of the CPCB along with the GHMC officials and come up with the appropriate solutions.

A copy of the Hon'ble NGT order dated 15.07.2024 is attached as **Annexure-I**.

2.0 ACTION TAKEN BY CPCB

2.1 Nomination of Additional Experts

In view of the Directions of Hon'ble NGT, three additional officials from organizations having expertise in requisite fields were nominated to the Expert Group. These organizations included National Institute of Hydrology (NIH), Roorkee; National Geophysical Research Institute (NGRI), Hyderabad; and Central Ground Water Board (CGWB). Further as few officials had superannuated from services, the concerned organizations were requested to provide replacements in the Expert Group. The list of the Expert group is provided as under in table 1:

Table 1: List of the Experts

S. No.	Name of Experts	Designation	Organization
1	Dr. Y.R.S. Rao	Scientist 'G'	National Institute Hydrology (NIH) Roorkee
2	Dr. Suresh Kumar	Assist. Chemist	Central Ground Water Board (CGWB)
3	Dr. M.J. Nandan	Chief Scientist	National Geo Physical Research Institute (NGRI) , Hyderabad
4	Ms. K. Sravanthi Jeevan	Assistant Adviser	Ministry of Housing and Urban Affairs
5	Dr. M.P. Patil	Chief Scientist	CSIR - NEERI
6	Mrs. Nigam Agarwal	Director	Department of Environment, Government of NCT of Delhi
7	Sh. P U Asnani	Chairman	UMC Global

8	Sh. Asad Warsi	Project Consultant,	Indore Municipal Corporation and Director of Eco Pro Environmental Services
9	Sh. Gajanan Kamat	Assistant Manager	Goa Waste Management Corporation
10	Prof. S K Singh	Erstwhile HOD, Civil Engg., DCE, Delhi	Vice Chancellor, Rajasthan Technical University, Rajasthan
11	Dr. Binisha Payattati	Executive Director	International Institute of Waste Management, Bangalore

2.2 Action taken by CPCB

2.2.1 First Meeting of the Expert Group

Since new members were included in the Expert group, a preliminary meeting was held on August 23, 2024, at 3:00 PM via video conference, chaired by the Member Secretary of CPCB. The purpose of the meeting was to brief the Expert members on the matter and seek their inputs for the same. Based on the deliberations, following action points were decided:

1. CPCB to share the relevant documents related to the matter including Hon'ble NGT direction, CPCB reports filed in compliance to the Hon'ble NGT Directions with the Expert members including representative from NGRI, NIH and CGWB.
2. Greater Hyderabad Municipal Corporation (GHMC) to prepare and make presentation on action plan with time line before the expert group on next meeting covering proposed holistic solutions and management of RDF generated on daily basis, RDF already lying on the site & semi-processed/fresh waste lying on the site in consultation with Telangana State Pollution Control Board.
3. CGWB to share the reports of Surface Water & Ground Water conducted during 2012 as informed during meeting.
4. GHMC to communicate CPCB their observations on data related to processing/ capacity on Solid Waste Management facilities mentioned in the recent report submitted to Hon'ble NGT by CPCB. CPCB and Telangana SPCB may jointly examine such observations on data.

A copy of the minutes of the meeting is attached as **Annexure II**.

2.2.2 Second Meeting of the Expert Group

The second meeting of the Group was convened by Member Secretary, CPCB on August 27, 2024. During this meeting, the GHMC presented their action plan, which included proposals

for the treatment of fresh waste & semi processed stored waste (**Annexure III**). It was observed that all issues including remediation of capped site/ contaminated ground water raised in CPCB report submitted dated 14.07.2024 had not been addressed. GHMC was suggested to present a comprehensive Action Plan addressing the recommendations made in in the CPCB report dated 14.07.2024 in the next meeting to be chaired by Chairman, CPCB.

During the meeting, CGWB informed that, according to a study conducted during 2012 around Jawahar Nagar site, there was a high concentration of some parameters such as TDS, TOC, sodium and fluoride in both surface water and groundwater. The report of CGWB is attached as (**Annexure-IV**).

Based on deliberations held following actions were decided:

1. GHMC to present a comprehensive Action Plan addressing the recommendations made in the CPCB report dated 14.07.2024.
2. TSPCB and CPCB, RD Chennai to jointly verify the observation on data as submitted by GHMC vide letter dated 24.08.2024.

Minutes of the meeting is attached as (**Annexure-V**)

2.2.3 Third Meeting of the Expert Group

The third meeting of the Expert group was convened on August 28, 2024. The meeting was chaired by Chairman, CPCB. CPCB made a presentation on the overall status of the matter including the directions of Hon'ble NGT and the salient features of three Reports submitted by CPCB in compliance of Orders issued by Hon'ble NGT on the matter. The major issues deliberated during the meeting included the following:

- a. The committee observed that capped waste in the dumpsite is contributing to leachate and the contamination of ground and surface water even three years after the capping has been completed. The contamination of groundwater underneath the dumpsite (which could not be monitored) is expected to be much higher.
- b. Additionally, owing to the high moisture content and biodegradable nature of the capped waste, the waste is expected to decompose and reduce in volume in future and hence there is potential hazard related to subsidence of the capped site.
- c. It was further suggested to GHMC that phase-wise biomining should be carried out to treat the capped waste by isolating the site
- d. GHMC made a presentation covering the existing facilities for the treatment of solid waste at the Jawahar Nagar site, which mainly included composting, co-

processing at cement plants, the Waste-to-Energy (WtE) plant, new prospective sites identified for processing and disposal of solid waste, and the proposed plan for the disposal of stored RDF. The presentation is placed at **Annexure VI**.

- e. CPCB observed that the issues related to the remediation of the capped waste had not been addressed and only issues, such as the management of RDF/semi-processed waste, details of present solid waste management facilities & prospective sites etc., had been covered in the action plan presented by GHMC. The action taken by GHMC vis-à-vis the recommendations of the CPCB report is placed at **Annexure III A**.
- f. It was recommended that the following four components should be covered in the Action Plan:
 - i. Address the gaps in solid waste management processing capacity in the catchment area of the Jawahar Nagar site
 - ii. Remediation of the capped waste
 - iii. Disposal of stored semi-processed waste/RDF stored at the site
 - iv. Remediation of groundwater & surface water.

It was further suggested that GHMC may contact IIT Roorkee for necessary assistance and guidance on the implementation of the aforementioned points.

Sh. Asad Warsi, Director of Eco Pro Environmental Services, opined that biomining should be undertaken. He also highlighted the potential for a significant amount of leachate generation from the capped site, which could further contaminate surface and groundwater. Another expert, Sh. P.U. Asnani, suggested that GHMC to come up with a complete blueprint for solid waste management. Furthermore, experts from NIH, NGRI, and CGWB endorsed that GHMC may contact IIT Roorkee (Dept. of Civil Engineering), which has expertise in the field, for the treatment of the capped area, biomining, and remediation purposes. The experts also offered to extend their expertise to GHMC as and when required. It was informed that CPCB shall also provide its support and guidance wherever it is required by GHMC.

- g. Following this, the GHMC representative informed that permission to cap the dumpsite was included in the Environmental Clearance (EC) issued to GHMC from the State Environment Impact Assessment Authority (SEIAA) of Andhra Pradesh, MoEF & CC, on 20.06.2012, which was as per the provisions of the then-existing MSW Rules, 2000.

Based on deliberations held, following action points were decided:

- a. GHMC, Telangana SPCB and CPCB RD Chennai to jointly confirm the data included in the CPCB Report submitted to Hon'ble NGT in July 2024
- b. GHMC to prepare comprehensive action plan addressing the key issues listed at Point (e) above.
- c. GHMC may engage IIT Roorkee for remediation of the capped dumpsite
- d. Representatives from the three organizations – NIH, CGWB & NGRI shall assist GHMC in assessing the impact of capped dumpsite on waste on soil and Ground water and remediation of the same.

Minutes of the Meeting is placed at **Annexure-VII**.

2.2.4 Regulatory & Legal aspects related to Capping of Dumpsite

- a. It was informed during the Meeting on 28.08.24 by GHMC that permission to cap the dumpsite was included in the Environmental Clearance (EC) issued to GHMC from the State Environment Impact Assessment Authority (SEIAA) of Andhra Pradesh, MoEF & CC, on 20.06.2012, which was as per the provisions of the then-existing MSW Rules, 2000.

The said documents were examined by CPCB and it was observed that:

- Environmental Clearance (EC) had been obtained by GHMC from the State Environment Impact Assessment Authority (SEIAA) of Andhra Pradesh, MoEF & CC, on 20.06.2012, with a validity period of 5 years which had expired in 2017.
 - The Municipal Solid Waste (Management & Handling) Rules, 2000, rule 31 stipulated the provisions for Closure of Landfill Site and Post-care.
- b. SWM Rules, 2016 outlines the following provisions related to biomining/capping of dumpsites as given below;
 - Rule 15 of SWM Rules , 2016 stipulates that the Local authority shall :
(zj) investigate and analyse all old open dumpsites and existing

operational dumpsites for their potential of bio mining and bio-remediation and wheresoever feasible, take necessary actions to bio-mine or bio-remediate the sites;

(zk) in absence of the potential of bio-mining and bio-remediation of dumpsite, it shall be scientifically capped as per landfill capping norms to prevent further damage to the environment.

- Schedule 1 (J) of SWM Rules 2016 stipulates the provisions for Closure and Rehabilitation of Old Dumps that - Solid waste dumps which have reached their full capacity or those which will not receive additional waste after setting up of new and properly designed landfills should be closed and rehabilitated by examining the following options:

i. Reduction of waste by bio mining and waste processing followed by placement of residues in new landfills or capping as in (ii) below.

ii. Capping with solid waste cover or solid waste cover enhanced with geomembrane to enable collection and flaring / utilisation of greenhouse gases.

iii. Capping as in (ii) above with additional measures (in alluvial and other coarse grained soils) such as cut-off walls and extraction wells for pumping and treating contaminated ground water.

iv. Any other method suitable for reducing environmental impact to acceptable level

It is observed that Capping of Dumpsite was also in violation of the provisions of SWM Rules 2016. Feasibility of biomining was to be carried out and capping could be done only in absence of the potential of biomining (Rule 15 zj & zk of SWM Rules 2016) Further, additional measures such as extraction well for pumping and treating contaminated ground water had to be provided in case of capping of the dumpsite (Schedule I (J) of SWM Rules 2016). In the GHMC matter, neither was the feasibility of biomining assessed nor were the corrective measures - such as extraction wells, cut-off walls etc. provided. The feasibility report was prepared by IIT Mumbai, post capping of the dumpsite in 2023. The capped waste was reported to be biodegradable in the IIT Mumbai Report.

- c. CPCB has prepared a Guidelines for Disposal of legacy waste (Old Municipal Solid waste) in 2019. As per the guideline capping as a solution to the legacy waste is not the first option as order of priority for environmentally safe legacy waste management
- d. A series of Hon'ble NGT & Supreme Court Orders were issued during the period 2020-21. Details of orders issued by Hon'ble SC & NGT are given in Table 2 below:

Table 2: Relevant paras of orders passed by Hon'ble SC & NGT

S. No.	Orders of NGT/Supreme Court
1	Hon'ble NGT (PB) in its Order dated 14.2.2020 in O.A. No. 606/2018 in Para 32 directed that we first consider the stand of the State for capping of the old dump site at Jawahar Nagar in Hyderabad. The stand is not legally and environmentally tenable. Capping will result in leachate remaining untreated affecting the ground water and gases in the dump site will remain unflared having potential for air pollution and hazardous for environment. Moreover, huge area of land which is scarce and valuable will be wasted. The cost involved will be far less than the value of the land and need for protection of environment. It is also wrong to say that bio-mining or bio-remediation can be only of small size dump sites and not big dump sites" (Annexure-A)
2	GHMC filed a Civil Appeal No. 11490/2020 in the Hon'ble Supreme court of India on 21.05.2020 against the impugned orders dated 14.02.2020 Hon'ble Supreme Court of India with regards to the Civil Appeal filed vide Dairy No. 11490/2020, order dated 15.06.2020 (Annexure-B) dismissed the appeal as withdrawn and appellants were directed to approach the Hon'ble NGT by filling an application for review of its order dated 14.02.2020 in OA No. 606 of 2018.
3	GHMC filed a review petition with Hon'ble NGT (PB), Delhi vide its order dated 18.02.2021 (Annexure-C) in RA No.02/2021 in OA No.606/2018, has dismissed the review application filed by GHMC by directing that <i>"8. Accordingly, even on reconsideration of the matter, in view of earlier binding orders of this Tribunal on the subject, the statutory mandate and the need for environmental protection, there is no merit in the review application. As already noted, it is not shown to be factually correct that when capping was done, it was</i>

	<i>legally permissible. The Tribunal has considered the issue earlier and rejected the very same contention not only of the applicants but also of several States/local bodies including Delhi Municipal Corporations, who find it convenient to avoid the mandate of law and to resort to capping, illegally and to the prejudice of the environment.</i>
4	After the review application was dismissed by the NGT (PB), a petition was filed in the Hon'ble Supreme Court of India vide Dairy No. 8943/2021 Hon'ble Supreme Court of India vide dated 31/01/2022 (Annexure-D) refused to pass any directions on the appeal made by GHMC and disposed of the case as directing "Delay condoned. No ground is made out for our interference with the judgment and order (s) passed by the National Green Tribunal. The appeal(s) is/are dismissed, accordingly.
5	Hon'ble NGT vide Order dated 29.9.22 in OA No. 606 of 2018 (Annexure- E) in respect of Telangana directed that • 12 Million Tonnes Legacy capped at Jawaharnagar dumpsite by GHMC • As per SWM Rules potential of bio-mining had to be first explored before resorting to capping, which has not been done. • As per previous NGT Orders, such capping is not permissible. • CPCB to examine this aspect in consultation with the concerned Experts and determine whether capping can be retained and if not what further course of action is to be taken for protection of environment.

Based on the aforementioned points, it is observed that the Capping of Jawahar Nagar dumpsite was carried out in violation of provision of SWM Rules (2000 & 2016) as well as when the matter was subjudice before the Hon'ble NGT and Hon'ble Supreme Court.

2.2.5 Confirmation of SWM Data as per issues raised by GHMC

- GHMC has sent a letter to CPCB, contesting the data submitted by CPCB in its Report submitted to Hon'ble NGT in July 2024 (**Annexure VIII**).
- As per the deliberations during the three Meetings, GHMC, Telangana SPCB & CPCB RD Chennai were to jointly confirm the data included in the CPCB Report submitted to Hon'ble NGT in July 2024.
- CPCB has issued emails dated 27 & 29 August, 2024 & 17 September, 2024 to TSPCB on the subject (**Annexure IX**).

- CPCB is yet to receive any confirmation from TSPCB regarding the data which submitted by CPCB in its Report submitted to Hon'ble NGT in July 2024 and contested by GHMC.

3. Recommendations

Based on deliberations held with experts, following action points are recommended:

(i) Remediation of Capped waste as well as Ground Water & Surface Water

- a. IIT Roorkee , NIH, CGWB and NGRI to carry out the feasibility study regarding possibility of remediation of the capped site and assessment of extent and trend of contamination of soil, ground water and surface waterbodies, Various aspects related to assessment of capping layer provided, potential hazard related to subsidence of the capped site due to settling waste , feasibility of bio-mining (considering volume of waste, space availability, utilization/disposal options for various rejects/by-products expected to be generated during bio-mining, etc.), leachate management, required remedial measures for waste as well as contaminated soil & water bodies to be covered in the feasibility report. The same be completed in two months.
- b. Thereafter, Detailed Project report (DPR) shall be prepared in accordance with provisions of SWM Rules covering the above and as per the Feasibility report by IIT Roorkee with assistance from NIH, CGWB and NGRI.
- c. The DPR shall be prepared within a timeline of 06 months and delineate the various actions/activities to be taken along with timeline for remediation of the GHMC dumpsite including remedial measures for waste, contaminated water bodies & soil, in line with the findings of the Feasibility report. The recommendations shall focus on both containing as well as preventing further damage to the surrounding environment.
- d. The cost of preparation of Pre-feasibility report and the DPR shall be raised by IIT Roorkee and may be borne through NGT EC fund at CPCB.
- e. GHMC shall provide all required assistance to IIT Roorkee and other Institutions in preparation of the Feasibility report. CPCB shall co-ordinate the aforementioned activities for the timely completion of the feasibility study for arriving at the future course of action. Email in this regard has been sent to IIT and the concerned Institutes, the same is placed at **Annexure X**.
- f. Based on the DPR, GHMC shall prepare the Action Plan for implementation of the various actions/activities outlined in the DPR. A Monitoring committee headed by Principal Secretary, Dept. of Environment, Govt. of Telangana with Member

Secretary, Telangana SPCB, CPCB RD-Chennai and Principal Secretary, UDD, Govt. of Telangana as members may be constituted to monitor the implementation of the Action plan. The Monitoring committee shall also identify funds for implementing each activities of the Action Plan.

- g. Telangana SPCB in consultation with CGWB to prepare a Comprehensive Ground & Surface Water Quality Monitoring Plan. Regular monitoring of Surface/ Ground water to be accordingly conducted by Telangana SPCB as per the Action Plan.

(ii) Development of adequate Solid waste processing capacity

The Hyderabad Integrated Solid Waste Management Facility at Jawaharnagar is not adequate for processing/utilizing entire received waste (8100 TPD qty) from Hyderabad city. The facility can utilize about 43.70% of waste against the generation of 8100 TPD and the rest 56.3% (i.e. 4560 TPD) is being accumulated in the processing facility as semi-processed waste. Presently 68.17 lac Tonnes of semi-processed is stored on its premises. GHMC shall develop adequate Solid waste processing capacity to manage the waste being handled at the site. Future projections in waste generation, for atleast ten years, shall be taken into consideration in development of the facilities. GHMC shall submit a time bound action plan for development of these facilities. Action points related to disposal of 68.17 Lac Tonnes of waste stored on its premises shall also be included in the Action Plan. Telangana SPCB to ensure implementation of the same as per the stipulated timelines.

(Divya Sinha)
Director & Divisional Head, UPC-II
CPCB, Delhi

Item No.07:-**BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI**

(Through Video Conference)

**Original Application No.199 of 2021(SZ) &
I.A. No. 96 of 2022(SZ)****IN THE MATTER OF:**Sri. Shankar Narayana Bala Krishna
Telangana and Ors.

...Applicant(s)

*Versus*State of Telangana,
Rep. by its Chief Secretary
Hyderabad and Ors.

...Respondent(s)

Date of hearing: 15.07.2024.**CORAM:****HON'BLE Smt. JUSTICE PUSHPA SATHYANARAYANA, JUDICIAL MEMBER****HON'BLE Dr. SATYAGOPAL KORLAPATI, EXPERT MEMBER**

For Applicant(s):

Ms. Mamatha Ralla & Mr. Muralidhar.

For Respondent(s):

Mr. Mohamed Aathic represented
Mrs. H. Yasmeen Ali for R1, R5, R7, R8.
Mr. Meyappan represented
Mrs. ME. Sarashwathy for R2.
M/s. N. Nathami for R3.
Ms. C.P. Kavitha Renjini represented
Mr. T. Sai Krishnan for R4.
Mr. Om Prakash, Sr. Adv. along with

Mr. D. Sreenivasan for R6.
M/s. Ritika Singhal, Avinash Desai,
Shaswant for R9 & R10.

Official Present: Mrs. H.D. Varalaxmi,
Regional Director,
Central Pollution Control Board (CPCB).

ORDER

1. In compliance with our Order dated 29.04.2024, the action taken report dated 14.07.2024 of the Central Pollution Control Board (CPCB) is filed.

2. The main focus of this report seems to be only about the leachate management in Jawahar Nagar, after detailing the sources of the leachate generation, the leachate collection system and the leachate collection from capped dumpsite and about the treatment of groundwater and surface water, etc. The analysis results have been examined and the observations are given in the report.

3. So far as the Leachate Treatment System is concerned, the Greater Hyderabad Municipal Corporation (GHMC) Facility has provided two leachate management facilities for the treatment and disposal of leachate. Leachate collected from the capped site is treated in 01 MLD capacity Leachate Treatment Plant (LTP). Leachate collected from the Waste (Semi-processed) Storage area is also treated in this LTP. The LTP consists of pre-treatment units with RO followed by a Multiple Effect Evaporator (MEE) system. The RO permeate is

used for greenbelt development, whereas condensate from MEE is partly utilized in ash quenching of Waste to Energy Plant, while the rest is disposed of into natural storm water drain. As per the consent condition, issued by TSPCB, RO permeate is either to be reused or it can be used for gardening. It does not stipulate the conditions for usage/discharge of MEE condensate. The residue generated from this process, as per the direction/authorisation of TSPCB, is being disposed of through the Waste to Energy Plant along with RDF.

4. Finally, in the conclusions and the recommendations, it is stated that the GHMC has identified three sites at Pyaranagar, Lakdaram and Khanapur for processing solid waste generated from the GHMC area and to minimize the load on Jawahar Nagar Facility. The other accumulated semi-processed waste in the Hyderabad Integrated Municipal Solid Waste Management (HIMSWM) Project also needs to be processed/utilized on priority. Thereafter, the capped site is to be opened gradually in a phase-wise planned manner for biomining. It is also stated that the said biomining will not take less than 5 years.

5. The report further states that the semi-processed waste is being dumped by the GHMC in the available spaces on the premises of the facility, including the spaces between the capped cells and also above the capped cells causing additional leachate generation.

6. The CPCB has stated that the GHMC shall achieve effective management of leachate as well as a reduction in contamination level of groundwater during and after the biomining of the site by temporarily covering the freshly dumped waste till the accumulated waste is processed at the facility.

7. Neither the GHMC should be allowed to dump it on the already capped site nor the CPCB allow them to temporarily cover the freshly dumped waste. This will lead to nowhere, as it will be creating another capped site.

8. When already the CPCB as well as the GHMC is finding it difficult to remove the capped waste, further capping should not be permitted. If GHMC is doing it by itself, it is always open to the CPCB as well as the Telangana State Pollution Control Board to step in to stop the same.

9. Despite the fact that this Tribunal has been following this matter from 2021 and though the various departments have engaged experts in this regard, so far no conclusion could be arrived at. The capped area itself is said to be more than 125 Acres, which is a fairly large area and the leachates from the area would be hazardous if it is not being treated scientifically.

10. It is high time for the GHMC and CPCB to stop the blame game, find an appropriate solution in a time-bound manner and treat the capped area.

11. Having waited so far, we request the Chairperson of the CPCB to convene a meeting with the concerned experts constituted by the head of the CPCB along with the GHMC officials and come up with the appropriate solutions.

12. Post the matter on 02.09.2024.

Sd/-

Smt. Justice Pushpa Sathyanarayana, JM

Sd/-

Dr. Satyagopal Korlapati, EM

O.A. No.199/2021(SZ)&
I.A. No.96/2022 (SZ)
15th July, 2024. AD.





केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA

F.No. CM-13013/19/2021-TECH-RD-CHENNAI-RD (Chennai)

Date: 27.08.2024

To,

1. The Expert members

(As per list)

2. The Commissioner

Greater Hyderabad Municipal Corporation CC Complex,
Tank Bund Road, Lower Tank Band, Hyderabad, 500063

3. The Member Secretary

Telangana State Pollution Control Board
A-3, Paryavaran Bhavan, Sanath Nagar Rd,
Sanath Nagar Industrial Estate, Sanath Nagar,
Hyderabad, Telangana 500018

Sub: Minutes of the meeting held on Aug 23, 2024 in O A No 199/2021 (SZ) in the matter of Sri Shankar Narayana Bala Krishna Telangana and Ors. Vs State of Telangana Rep by its Chief Secretary Hyderabad and Ors.

Sir,

This is in reference to the meeting of expert group held on 23rd August 2024 at 3.00 PM through VC on above captioned subject.

The minutes of the meeting is enclosed herewith for kind perusal and necessary action in the matter.

Yours faithfully,

(Divya Sinha)

Director & DH, UPC-II, CPCB

Encl.: As above

Copy to:

1. PS to CCB: For Kind information of CCB, Please.
2. PS to MS: For Kind information of MS, Please.
3. Regional Director, CPCB RD Chennai: For Information, Please
4. DH, Law Div.: For information, Please.

(Divya Sinha)

‘परिवेश भवन’ पूर्वी अर्जुन नगर, दिल्ली-110032

Parivesh Bhawan, East Arjun Nagar, New Delhi - 110032

दूरभाष/Tel: 43102030, 22305792, वेबसाइट/Website : www.cpcb.nic.in



Central Pollution Control Board

Minutes of the meeting held on Aug 23, 2024 in O A No 199/2021 (SZ) & I A NO 96/2022 (SZ) in the matter of Sri Shankar Narayana Bala Krishna Telangana and Ors. Vs State of Telangana Rep by its Chief Secretary Hyderabad and Ors.

A Meeting was held on August 23, 2024 via video conferencing, under the chairmanship of Member Secretary, CPCB, with experts to deliberate on directions given by Hon'ble NGT to find an appropriate solution within a specified timeframe in above subject matter. Representatives from the Greater Hyderabad Municipal Corporation (GHMC), Telangana State Pollution Control Board and officials from the CPCB Regional Directorate, Chennai as well as the CPCB Head Office, also participated in the meeting. The list of participants is attached as **Annexure I**.

The Member Secretary, CPCB, welcomed the participants and informed that the purpose of this meeting was to interact with experts so that a consolidated consensus and recommendations could be presented at the subsequent meeting which will be chaired by the Chairman, CPCB.

Subsequently, CPCB made a detailed presentation highlighting the chronology of the matter, the latest directions from the Hon'ble NGT, and the reports submitted by CPCB in compliance with these directions. The presentation made by CPCB is attached as **Annexure II**.

The Member Secretary, CPCB, requested the participants and experts to share their views on various issues, including fresh waste management, dumping of waste on capped landfill sites, leachate management, and the contamination of surface water, groundwater and soil, along with its remediation.

Further, CPCB inquired about status of these issues from GHMC. In response, GHMC provided details regarding RDF, fresh waste management, waste processing facilities and capacities and leachate management, along with request for some factual corrections to the CPCB report filed on July 14, 2024.

Representative of GHMC made certain observations on data related to processing/ capacity on Solid Waste Management facilities included in the recent report submitted to Hon'ble NGT by CPCB.

Dr. Suresh Kumar from CGWB informed that, according to a study conducted during 2012 around Jawahar Nagar site, there was a high concentration of some parameters such as TDS, TOC, sodium and fluoride in both surface water and groundwater.

The new members of the expert group requested additional time to properly understand the matter and provide their valuable inputs in the next meeting.

Based on deliberations held, following actions were decided:

1. CPCB to share the relevant documents related to the matter including latest NGT directions, CPCB reports filed in compliance to the Hon'ble Directions with the Expert members including representative from NGRI, NIH and CGWB. (**Action: CPCB**)
2. Greater Hyderabad Municipal Corporation to prepare and make presentation on action plan with time line before the expert group on next meeting covering proposed holistic solutions and management of RDF generated on daily basis, RDF already lying on the site & semi-processed/fresh waste lying on the site in consultation with Telangana State Pollution Control Board. (**Action: GHMC & TSPCB**)
3. CGWB to share the reports of Surface Water & Ground Water conducted during 2012 as informed during meeting (**Action: CGWB**)
4. GHMC to communicate CPCB their observations on data related to processing/ capacity on Solid Waste Management facilities mentioned in the recent report submitted to Hon'ble NGT by CPCB. CPCB and Telengana SPCB may jointly examine such observations on data. (**Action: GHMC**)
5. Next meeting is to be held on **August 27, 2024 at 4:30 P.M.** (**Action: CPCB**)

The meeting ended with vote of thanks to the chair.

List of participants.

SN	Name of Experts	Designation	Organization
1	Sh. Bharat Kumar Sharma	Member Secretary	Central Pollution Control Board
2	Mrs. Divya Sinha	Director & DH, UPC-II	Central Pollution Control Board
3	Sh. Vinod Babu	Director & DH WM Div	Central Pollution Control Board
4	Mrs. H.D. Varalaxmi	Regional Director	RD Chennai, Central Pollution Control Board
5	Dr. Y.R.S. Rao	Scientist 'G'	National Institute Hydrology (NIH) Roorkee
6	Dr. Suresh Kumar	Assist. Chemist	Central Ground Water Board (CGWB)
7	Dr. M.J. Nandan	Chief Scientist	National Geo Physical Research Institute (NGRI) , Hyderabad
8	Ms. K. Sravanthi Jeevan	Assistant Adviser	Ministry of Housing and Urban Affairs
9	Dr. M.P. Patil	Chief Scientist	CSIR - NEERI,
10	Dr. P U Asnani,	Chairman	UMC, Global
11	Mr. Gajanan Kamat	Assistant Manager	Goa Waste Management Corporation
12	Dr. Binisha Payattati	Executive Director	International Institute of Waste Management, Bangalore
13	Ms. Rani V.R.	Scientist 'D'	Central Ground Water Board (CGWB)
14	Dr. G. krishnamurthy	Regional Director	Central Ground Water Board (CGWB, Hyderabad)
15	Prof. S.K. Singh	Erstwhile Head of Civil Engineering, DTU	Vice Chancellor, Rajasthan University
16	Sh. Koteswar Rao	Superintending Engineer	Greater Hyderabad Municipal Corporation
17	Mrs. Srujana Shree	SEE	Telangana State Pollution Control board
18	Mrs. Poornima B.M.	Scientist 'D'	RD, Chennai, Central Pollution control Board
19	Mrs. Suniti Parashar	Scientist 'C'	Central Pollution Control Board
20	Sh Madnesh Kumar Dubey	Scientist 'B'	Central Pollution Control Board
21	Sh. Amit Kumar	Scientist 'B'	Central Pollution Control Board

MEETING OF EXPERTS

**In compliance to
Hon'ble NGT order dated 15.072024 in O A No
199/2021**



**UPC-II Div, CPCB
23rd August , 2024 , 3.00 PM**

AGENDA

DATE & TIME : 23/08/2024 , 3:00 PM Onwards

VENUE : CPCB (THROUGH VIDEO CONFERENCE)

Time	Subject
3.00-3.05 PM	Welcome
3.05-3.10 PM	Brief on Hon'ble NGT order
3.10-3.20 PM	Presentation by CPCB
3.20-3.230 PM	Views of experts
3.30-3.35 PM	Way Forward

List of Experts

SN	Name of Experts	Designation	Organization
1	Dr. Y.R.S. Rao	Scientist 'G'	National Institute Hydrology (NIH) Roorkee
2	Dr. Suresh Kumar	Assist. Chemist	Central Ground Water Board (CGWB
3	Dr. M.J. Nandan	Chief Scientist	National Geo Physical Research Institute (NGRI) , Hyderabad
4	K. Sravanthi Jeevan	Assistant Adviser	Ministry of Housing and Urban Affairs
5	Nomination not received		MCD
6	Dr. M.P. Patil	Chief Scientist	CSIR - NEERI,
7	Ms. Nigam Aggrawal	Director	Department of Environment, Government of Delhi
8	Dr B Sen Gupta	Erstwhile Member secretary, CPCB	Central Pollution Control Board
9	Dr. P U Asnani,	Chairman	UMC, Global
10	Dr. Asad Warsi,	Project Consultant,	Indore Municipal Corporation and Director of Eco Pro Environmental Services
11	Mr Lewinson. J Martin	Managing Director	Goa Waste Management Corporation
12	Prof S K Singh,	Erstwhile Head of Civil Engineering,	VC Rajasthan University
13	Dr Binisha Payattati	Executive Director	International Institute of Waste Management , Bangalore

CHRONOLOGY

- **OA No 199/2021** - non implementation of SWM Rules, 2016 in Telangana especially at Jawaharnagar site , Hyderabad
- **Hon'ble NGT order 15.9.2021** directed respondents including CPCB to file report
- Meanwhile, in **OA no 606/2018 ,Order dated 29.9.2022** directed CPCB to examine in consultation with Experts whether capping can be retained and if not what further course of action is to be taken for protection of environment.
- **CPCB filed Report dated 25.9.2023** based on consultation **30.12.2022** and site inspections **1-2/9/2023** with experts.

CHRONOLOGY contd...

Conclusions of the CPCB report dated 25.9.2023 :

- Options of gradual conversion of capped area and the stabilized waste underneath may be bio-mined gradually, without effecting the functions of capped area immediately. This shall require a detailed project report address the following aspects;
- The environmental and economic benefits of the investment already made
- The net damage (soil, surface & groundwater) that may continue to occur during the capping period, including the time period for which leachate is expected to be generated.
- Detailed hydrological study to assess impact generation on the surface /ground water bodies
- The requirement of remediating contaminated groundwater even after initiating the bio mining
- The detailed assessment of the observations made in the report of IIT Bombay

CHRONOLOGY contd...

Hon'ble NGT order 1.2.2024 in 199/2021 directed

(i) CPCB to direct the GHMC or the State Pollution Control Board to construct additional collection wells of the leachate for the purpose of treatment which would avoid contamination of downstream water bodies. CPCB communicated letter dated 29.2.2024 to TSPCB

(ii) The leachate that is entered into the downstream water bodies has to be remediated, for which, the CPCB has to furnish a technical report. Technical report on "REMEDIATION OF WATER BODIES /LAKES submitted by CPCB

(iii) The expert opinion in this regard is awaited to address the following aspects namely (i) Environmental and economic benefits of the investment already made (ii) Net damage (soil, surface & groundwater) that may continue to occur during the capping period , including the time period for which leachate is expected to be generated (iii) Hydrological study to assess the impact of leachate generated on the surface /groundwater bodies and (iv) a detailed assessment of observation made in the report of the IIT Bombay." CPCB consulted experts on 1.3.2024

CHRONOLOGY contd...

- **CPCB submitted report dated 16.4.2024 includes**
- Experts pointed that environmental and economic benefit of the investment cannot be directly estimated as it needs time series data w.r.t Groundwater, air, soil, odour and water at the site and its surroundings.
- Regarding Hydrological study, the experts recommended that Telangana SPCB shall identify a suitable agency /institution to carry out a comprehensive study.
- **Hon'ble NGT order dated 29.4.2024** directed CPCB to do the required study in the interest of the nation to address the issue of leachate from the dumping yards in various states to come out with an appropriate guideline and also issue appropriate directions to the SPCBs, in particular to the Telangana SPCB with regard to the case in hand.“
- **Report Dated 14.7.2024** was filed by CPCB based on joint inspection of the site.....

CPCB report dated 14.7.2024

SITE FEATURES

- Waste received -8100 MT/day (from GHMC area)
- Area of GHMC site -339 Acres (125 Acres & 214 Acres reclaimed for SW facilities)
- Dumpsite since 1996
- M/S Hyderabad Integrated MSW Project –Since 2012, by proponent
- Capped landfill-125 Acres
- Sanitary landfill for rejects (27 Acres)
- Leachate Collection & Treatment – 01(01 MLD)
- Landfill gas collection System -155 Boreholes
- Semi Processed solid waste stored at site – 68,17,487 MT in last 12 years

PROCESSING FACILITIES

- 8100 TPD Mixed waste - 4300 TPD and 3800 TPD (through tromelling)
- 4300 TPD(1200 TPD WTE Plant - 24 MW , 340 TPD Co-processing in Cement Industry, 2760 TPD Stored as RDF in premises)
- 3800 TPD(3800 Windrow Compost, Rejects -1392 TPD)
- Out of 8100 TPD , 3540 TPD is processed (43.7%) and 4560 (56.3%) is dumped at site
- There is no space for expansion of the Jawaharnagar plant

LEACHATE MANAGEMENT

- Source- Seepage along periphery of old capped area
Percolation on ground from dumpsite
Semi Processed waste stored in lined area
Fresh waste drying in composting area prior to tromelling in unlined area
- Leachate quantity(Avg/day) -533 KL from fresh waste , 53 KL from capped site, additionally 47KL is formed due to surface runoff from premises
- Collection System – 5 collection ponds, 02 additional ponds , storage capacity 35300 KL
- No provision to collect leachate percolating to the ground due to unlined base

LEACHATE MANAGEMENT Contd...

- Leachate treatment plant (LTP) -01 MLD for capped site & storage site of semi processed waste having RO and MEE
- Use of RO permeate in gardening – Consented
- Condensate from MEE is partly utilised for ash quenching of WTE, rest disposed in storm water drain – No condition consented
- Residue disposed through WTE with RDF.
- Legacy leachate accumulate in Malkaram Pond was earlier treated in 2 MLD RO plant and rejects stored in artificial created storage ponds – 05 No out of which 2 are lined and others unlined
- Since Oct-2023 , MVR of 2 MLD installed to treat leachate in Malkaram tank and other 05 artificial ponds .
- Treated water is disposed in drain which joins Edula Cheru. Residue disposed to SLF

QUALITY OF LEACHATE, SURFACE AND GROUND WATER –Latest report of CPCB

- The Groundwater of all monitored Piezometric wells are contaminated w.r t TDS and COD –Latest inspection , July 1st 2024 indicates intrusion of Leachate
- TSPCB collected samples of monitoring wells and surface water bodies from Jan - May 2024 indicates increasing trend for TDS and COD
- MEE condensate from Leachate treatment plant shows high COD shows inefficient working. Consent conditions doesn't mention about its utilization . Partly used for ash quenching and rest discharged in drain
- MVR condensate to be discharged in surface water bodies as per consent w. r t COD and TDS. Analysis results of MVR is meeting the norms of SWM Rules, 2016

CONCLUSIONS & RECOMMENDATIONS

- The HIMSWM is not adequate for treatment of 8100 TPD of waste .
- Three sites were identified by GHMC for processing of fresh solid waste in 2017 , needs to be made operational on priority to reduce load on HIMSWM
- Immediate steps to be taken for additional processing facility at these site or at HIMSWM
- Operationalize the WTE being set up at HIMSWM
- Expedite to process 68.17 Lacs of RDF stored in the premises
- The accumulated semi processed waste to be treated on priority
- Capped site to be **opened gradually in phased wise manner.**
- Groundwater is contaminated with leachate.
- LTP is not working efficiently indicating high COD in MEE condensate

CONCLUSIONS & RECOMMENDATIONS

- TSPCB to immediately prescribe standards for treated leachate & its utilization
- The landfill gas collection system to operate till capped cells are bio mined.
- Only 14 % of gas generated is utilized & remaining flared
- Capacity of gas processing plant to be increased for energy recovery.
- Fresh waste stored in composting area on unlined surface and no provision for collection of leachate. Contaminating both surface and groundwater. Provisions to be made immediately to stop contamination and leachate to treatment plant.
- MEE and MVR residue to be tested & to be disposed as per HWM Rules, 2016 if found hazardous .

CONCLUSIONS & RECOMMENDATIONS

- The active contamination of SW and GW is due to ;
- Seepage of un quantifiable leachate , beneath old capped area
- Drying of fresh waste on unlined surface
- Run off from various processing facilities
- Seepage from one unlined leachate storage ponds.

Measures to be taken

- Temporarily covering the fresh dumped waste till accumulated waste is processed .
- Lining of area used for drying of waste
- Generated Leachate to be collected and treated
- Empty unlined leachate storage ponds after treatment of leachate
- Prevent overflow from leachate storage ponds by construction of additional storage ponds
- GHMC to undertake projects for remediation of contaminated groundwater and surface water bodies. DPR through expert agency to be made. Remediation project under supervision of TSPCB through a technical expert committee , Monitoring by Dept of Env , govt of Telangana.
- Assessment of extent of contamination of SW and GW & Soil Status if any ,and remediation
- CPCB requested to give three months time for Preparation of comprehensive guidelines for leachate management at dumpsite.

Directions of Hon'ble NGT (order dated 15.07.2024)

(10) It is high time for the GHMC and CPCB to stop the blame game, find an appropriate solution in a time bound manner and treat the capped area

(11) Having waited so far we request the Chairperson of the CPCB to convene a meeting with the concerned experts constituted by the head of the CPCB along with the GHMC officials and come up with the appropriate solutions.

Observations of Hon'ble NGT (15.07.2024)

- **Ongoing Dumping Issues:** GHMC continues to dump semi-processed waste in available spaces at the facility, including between and above capped cells, increasing leachate generation.
- **Inadequate Treatment and Regulation:**
 - Lack of specific conditions by TSPCB for the usage/discharge of MEE condensate.
 - Concerns over the scientific treatment of leachates from the large capped area (125+ acres).
- **Future Waste Management:**
 - Biomining of the site will not take less than 5 years.
 - Hon'ble Tribunal emphasizes the urgency of reducing groundwater contamination and managing leachate effectively during and after biomining.
- **Concern on Further Capping :**
 - NGT suggests further capping should not be permitted .
 - Urges CPCB and TSPCB to intervene if GHMC continues unauthorized capping.

- Treatment of fresh waste
- Treatment of semi processed stored waste
- Biomining of capped legacy waste
- Scientific Leachate treatment
- TSPCB prescribe standards for treated leachate & its utilization & Stipulate conditions for usage/discharge of MEE condensate
- Assessment of extent for SW , GW & Soil contamination & its remediation
- Preparation of comprehensive guidelines for leachate management at dumpsite.



Response to CBCP Queries on NGT Order (Jawahar Nagar Processing & Disposal facility)

R. Srinivasa Reddy- Executive Engineer

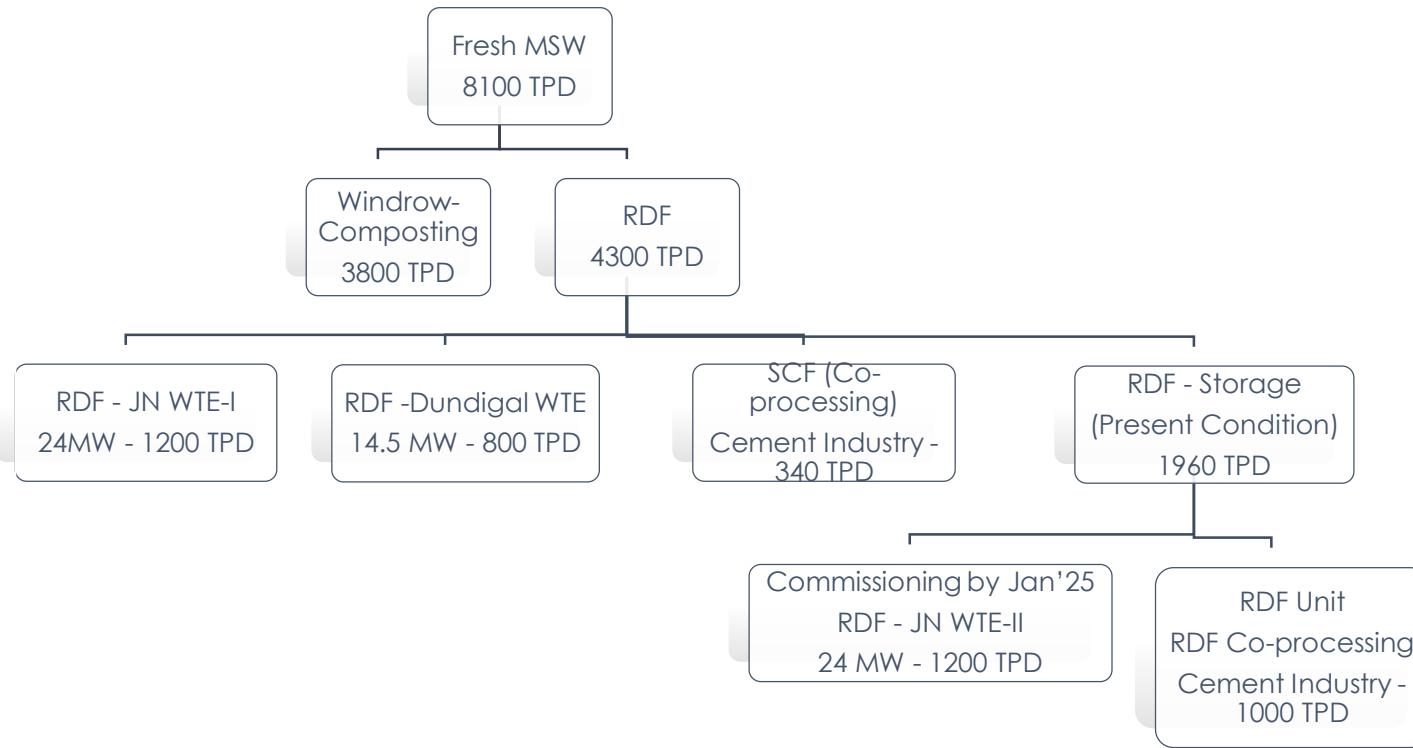
Agenda

This Presentation Contains

- Utilization plan for Refuse Derived Fuel (RDF) of Jawahar Nagar Processing & Disposal facility.
 - Currently generating Refuse Derived Fuel (RDF) &
 - Stored RDF.
- Leachate Management
 - Legacy leachate &
 - Fresh Leachate.
- Ground Water Quality.
- Alternative Lands

Infrastructure installed to dispose of RDF (As on date)

- The fresh municipal solid waste (MSW) receipt at Jawahar Nagar Site (JWNR) stands at about 8100 TPD from GHMC and surrounding 15 municipalities.
- After pre-sorting, the segregated combustible fraction (SCF) constitutes around 53% of the waste, resulting in approximately 4300 metric tons per day of RDF generation



Description	UOM	FY24	Remarks
Fresh MSW	MT	8100	
RDF Portion	MT	4300	
Available Infrastructure for disposal of RDF			
WtE-JWNR Phase 1	MT	1200	Operational
WtE-2 (Dundigal)	MT	800	Operational
SCF Co-processing Cement Industries	MT	340	
RDF Unit	MT	1000	Under Trial run
Under Construction Infrastructure for disposal of RDF			
WtE-JNW(Phase-2)	MT	1200	To be operational by Jan'25
Total	MT	4540	

*Above mentioned numbers are approximate

- It is evident from the above that, after processing fresh waste to the tune of about 8100 TPD, all the RDF recovered is being processed and nothing will be left for storage after commencement of WtE phase II

Stored RDF Utilization Plan

- There is around 68,17,487 MT of RDF stored within JWNR facility

Sl. No.	Period	Description	RDF Quantity in 'Ton'
1	Feb'2012 to March'2015	RDF Generation	10,95,758.00
		RDF supplied to the Cement plants	(6,759.00)
		Net storage West side of the processing plant :	10,88,999
2	April'2015 to Sep'2023	RDF Generation	69,69,758.19
		RDF supplied to the WTE plants	(15,46,226.00)
		RDF supplied to the Cement plants	(1,32,081.50)
		Net storage at East & South side of the Processing plant :	52,91,451
3	Oct'23 to March'24	RDF Generation	7,65,588.79
		RDF supplied to the WTE plants	(2,97,525.00)
		RDF supplied to the Cement plants	(31,026.50)
		Net storage at North side of the processing plant :	4,37,037
Total Quantity stored :			68,17,487

Proposed plan for RDF Storage clearance.

- There are approximately 33 Cement Units within 300 Kms with a combined fuel requirement of 21,200 TPD. Considering 15% TSR, RDF requirement translates to 3200 TPD.
- It is proposed to clear the stored RDF within five year by setting up 5 (five) RDF units of 1000 TPD each processing capacity at appropriate locations.
- On average, these units will generate 3,500 TPD of RDF from the stored material.
- Inert/process rejects of 1,500 TPD generated from the RDF process will be landfilled at Jawaharnagar site itself.

- Support Required from CPCB:** Consistent offtake from Cement industries has been a major challenge due to varying usage of AFR and Coal price trends.
- CPCB/ TGPCB may kindly facilitate necessary support/permissions from KSPCB, APPCB and MPPCB for the above offtake plan to materialize.

Leachate Management - Legacy

Legacy Leachate:

- Over the years, the “Legacy Leachate” generated from the old dump at the Jawahar Nagar MSW facility accumulated in various artificial ponds.
- These ponds were created to contain the overflow into downstream lakes from the site.
- In 2017, mobile reverse osmosis (RO) plant of 2X2000 KL capacity were installed to manage the leachate overflow during monsoons.
- However, the same could be used only to mitigate the situation from overflow during monsoon period.
- After completion of scientific capping of the legacy dumpsite, GHMC has invited Global RFP, vide NIT No: 15/SE (SWM)/GHMC/2019- 20 dated 02.01.2021 for “Comprehensive Treatment and Disposal of Legacy Leachate until Restoration and Stabilization of ponds adjacent To IMSWM Plant at Jawahar Nagar on Build, Own, and Operate (BOO) basis”.
- The objective of the Project was the comprehensive treatment and disposal of entire leachate and contaminated storm water from the site including the disposal of rejects and sludge from the artificial ponds to enable the reclamation of land by the Authority and Restoration & Stabilization of Malkaram tank to its natural state by the Concessionaire.

Leachate Management- Legacy



- The status of legacy leachate is tabulated as below,

Jawahar Nagar Legacy Leachate Treatment Plant					
Sr. No.	Description	Pond's Area (Sq.mt)	Leachate Qty. As per Agreement KL	Total treated Qty. as on 30.07.2024	Balance to be Treated KL
1	Malkaram Pond	118289	386,248	386,248	0
2	Pond -1	3601	17,123	17,123	0
3	Pond -2	5787	22,713	22,713	0
4	Pond -3 i/c Buffer Pond 3	13286	15,825	15,825	0
5	Pond -4	3844	22,125	22,125	0
6	Pond -5 to 9 including Buffer pond -1 & 2	106027	263,873	131,347	132,525
7	Southern side pond	16025	53,815	31867	21949
8	Karimnagar	18429	12,748	12,748	0
	TOTAL		794,474	6,40,000	1,54,474
9	Anticipated Qty. due to rainfall		55,306	0.00	55,306
	Total		849,780	6,40,000	2,09,780
Days Required to Treat the Balance					180

- Present Status:** Originally there was about 850,000 KL of legacy leachate present in 8 distinct locations, out of which approximately 6,40,000 KL is treated as of now and it would take another 6 months treat the balance.

Leachate Management - Fresh Leachate

Fresh Leachate:

- Presently 1MLD fresh leachate treatment plant is installed consisting of Pre-treatment, two stage reverse osmosis followed by multiple effect operator and Activated Thin Film Dyer which is adequate to manage the fresh leachate generation from the facility.
- If any additional capacity is required in the future, spare capacity from the Legacy Leachate Treatment plant shall be utilized as the same belongs to the sister concern of the Concessionaire.

Ground Water Quality

- Jawahar Nagar facility is spread in 339 acres and is an erstwhile dumpsite with waste dumping activity beginning from 2001 from Alwal and Kapra Municipalities.
- Starting from 2004, Jawahar Nagar dump site started receiving unsegregated MSW from all over Hyderabad.
- Prior to the initiation of the reclamation works in 2011-12, the site functioned as a uncontrolled solid waste dumpsite.
- Approximately 12 million metric tons of waste was present on the site at the time of handing over to the Concessionaire for reclamation.
- This prolonged period of accumulation of mixed MSW over the site has led to contamination of surrounding water bodies and ground water.
- Ground water sample in 2013-14 in the areas downstream of the legacy leachate ponds indicate an average COD level of 300-3642 mg/l. and average TDS level from 4992-13968 mg/l,
- Ground water sample collected from villages/settlement around year 2013-14 located downstream of the site indicated average TDS level from 910-6410 mg/l.
- The above constitute the documented baseline of ground water quality in the area, attributable to historical open waste dumping practice.

Ground Water Quality

- The legacy waste was confined to a footprint of around 125 acres and scientifically capped, thereby 234 acres of land was reclaimed.
- Ground water samples post completion of capping have shown significant decline in the downstream monitoring wells. TDS level from 1040-5713 mg/l.
- Samples collected and tested from neighbouring villages also show stabilization in the parameters. TDS level from 575-940 mg/l.
- Since 2018 GHMC is supplying drinking water to the nearby villages through Water Board connections as well as by water tankers to mitigate drinking water requirements.
- Based on the comparison of current groundwater quality with the historical baseline it is evident that natural attenuation of contamination is occurring on accelerated basis post source control measure that have been taken in recent years. GHMC will continue to carefully monitor the ground water through monitoring wells in the region and continue to supply drinking water.

Leachate Management - Fresh Leachate

Fresh Leachate:

- Presently 1MLD fresh leachate treatment plant is installed consisting of Pre-treatment, two stage reverse osmosis followed by multiple effect operator and Activated Thin Film Dyer which is adequate to manage the fresh leachate generation from the facility.
- If any additional capacity is required in the future, spare capacity from the Legacy Leachate Treatment plant shall be utilized as the same belongs to the sister concern of the Concessionaire.

Alternative Lands

- As the Jawahar Nagar facility is not adequate for future waste generation from the entire catchment, GHMC already identified 3 new sites for development of the processing & disposal facilities which are at various stages of approvals for establishment of new facilities.
- As such, GHMC plans to limit the waste intake at Jawaharnagar to between 4000 - 5000 tons per day and reduce the same further in future.
- Following locations are under consideration
 - Dundigal-85 acres,
 - Lakdaram-100 Acres,
 - Pyaranagar-150 Acres.
- GHMC will ensure that processing of the waste at these sites shall commence within 12 to 24 months.

Thank You

Annexure - III A

Sl. No	CPCB's Recommendations	GHMC's Response
1	GHMC has identified three sites at Pyaranagar, Lakdaram and Khanapur for processing solid waste generated from GHMC area and to minimize the load on Jawaharnagar facility. GHMC may either develop these sites on priority, and manage the fresh waste in these facilities instead of accumulating it in JNSWMF or develop additional processing/utilization capacity at JNSWMF	As such, GHMC plans to limit the waste intake at Jawaharnagar to between 4000 - 5000 tons per day and reduce the same further in future. • Following locations are under consideration 1. Dundigal-85 acres, 2. Pyaranagar-150 Acres 3. Lakdaram-100 Acres, 4. Malkapur - 200 Acres • GHMC will ensure that processing of the waste at these sites shall commence within 12 to 24 months. Compost plant of capacity 4,000 TPD (Note: i. as per Readiness Certificate issued by EPTRI). This is to be validated by TGPCB In view of above, only 6140 TPD (75.8%) of the total received waste 8100 TPD is fully utilized and the remaining 1960 TPD (24.2%) of semiprocessed waste (+70 mm fraction only) accumulates in the HIMSWM Project premises. 1392 TPD of rejects is generated during processing of 3800 TPD of -70 mm fraction in the composting facility which is disposed of in the Sanitary landfill (SLF) located in HIMSWM Project The semi-processed waste being stored temporarily in spaces between capped sites and above the capped sites for want of preparation of lined storage area is now being shifted (in progresss) Cement Units within 300 Kms identified with a combined fuel requirement of 21,200 TPD. Considering 15% TSR, RDF requirement translates to 3200 TPD Cement Units within 300 Kms with a combined fuel requirement of 21,200 TPD. Considering 15% TSR, RDF requirement translates to 3200 TPD It is proposed to clear the stored RDF within 5 years by setting up 5 (five) RDF units with processing capacity 1000 TPD each at appropriate locations. On average, these units will generate 3500 TPD of RDF from the stored material.
2	GHMC to operationalize the WtE Plant being set up in JNSWMF and also identify additional avenues for	Waste to Energy (WTE) Plant – 24 MW capacity; 14.5 MW capacity WTE commissioned in March 2024 at Dundigal.

	processing of RDF accumulated (68.17 lac T) on its premises.	Another unit of 24 MW capacity is under construction. Waste to Energy (WTE) Plant – 24 MW capacity; 14.5 MW capacity WTE commissioned in March 2024 at Dundigal. Another unit of 24 MW capacity is under construction.
3	The capped site is to be opened gradually in phasewise planned manner for biomining .	Request not to open the scientifically capped dumpsite
4	Conditions for discharge of MEE condensate have not been stipulated in the Consent issued by TSPCB. TSPCB shall prescribe standards for MEE condensate and prescribed its utilization/discharge conditions in the Consent / Authorization issued to GHMC,	No action reported by TSPCB
5	GHMC shall immediately conduct efficacy assessment of the leachate treatment system and improve its performance.	We wish to reiterate that the LTP Consist of three treatment unit, RO, followed by Multiple Effect Evaporator (MEE) followed by Agitated Thin Film Drier (ATFD) System. The RO permeate is used for green belt development, where as condensate from MEE is fully utilized in bottom ash quenching of WtE plant. • Above system is adequate to manage the fresh leachate generation from the facility.
6	Efforts be put to increase utilization of the gas and flaring of landfill gases shall be minimized by increasing the capacity of gas processing plant. The operator of Integrated Municipal Solid Waste Management Project shall explore the option of utilizing lean landfill gases for possible energy recovery through Waste to Energy Plants.	The Gas engine of 1500 kva is commissioned at Jawaharnagar to utilize 350 cum per hour of purified gas (full capacity of existing CBG plant) to generate the power and the same is being utilized for RDF plant operations. • The Purified gas being supplied to isnapur biomedical incineration unit. • GHMC will ensure appropriate utilization of the entire gas from the capped dump either through GAIL for power generation for captive usage
7	GHMC shall ensure that the drying of waste is done on a lined area and with proper arrangement for collection of leachate from this sections and its conveyance to the leachate treatment plant.	The fresh waste is stored on the Tipping floor for 7 days before the composting plant, which is an SFRC (steel-fibered reinforced concrete) 170mm thick which is impermeable. The design is approved by IIT Madras. • The entire floor of the composting plant has the same floor with a 2% slope connected with the garland drain of RCC to collect the leachate and it is ultimately connected with the main

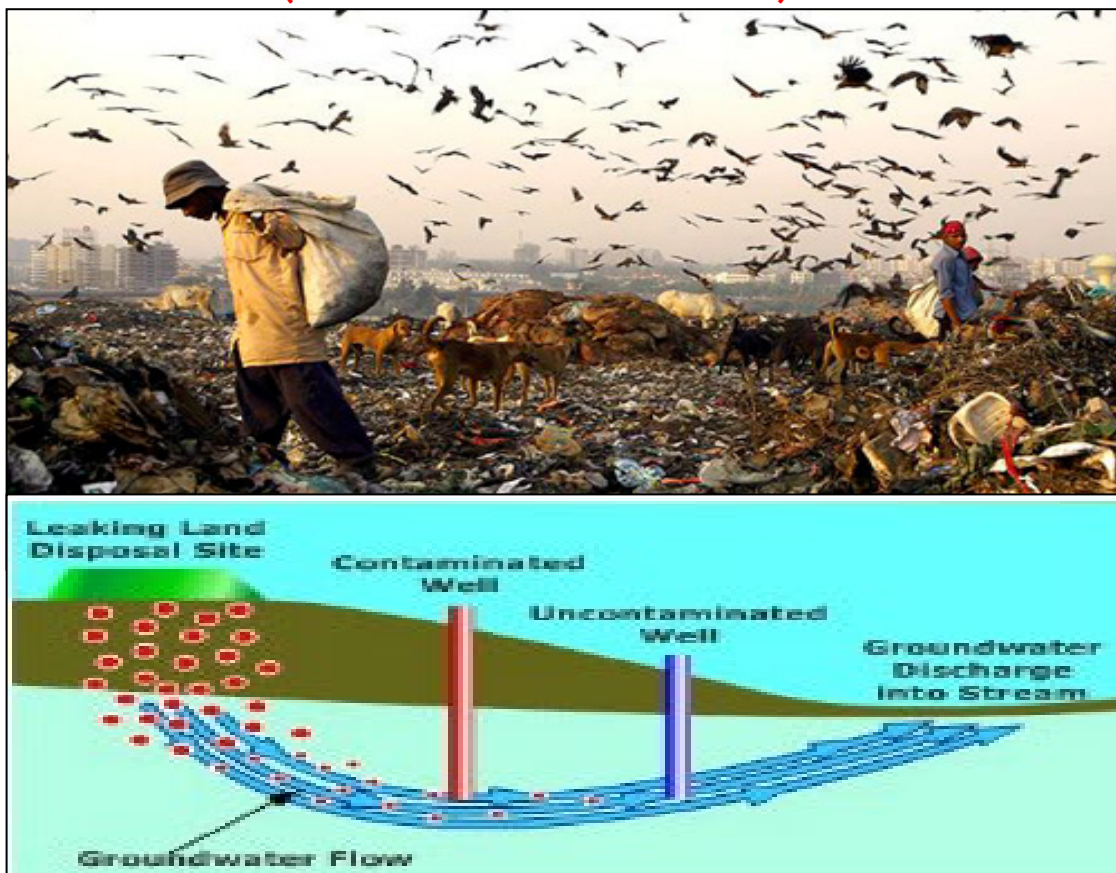
		leachate collection system. • GHMC is assuring all the working platforms in the Integrated facility are impermeable with prior approval of construction from an independent engineer
8	TSPCB has to assess the characteristics of the residue which is generated from MEE as well as the MVR to confirm whether or not, it is hazardous waste. It is to be disposed of as per provisions of HWM Rules 2016, if found to be hazardous waste.	No action reported by TSPCB
9	GHMC has to undertake projects for remediation of contamination in ground water and surface water bodies (ponds) in and around the JNSWMF. In this regard, Detailed Project Report be prepared engaging an expert agency, by detailing out extent of contamination of Ground water as well as the surface water bodies in and around the JNSWMF and identification of remediation technics based on techno-economical feasibility and receptor's health risk considerations for the site followed by execution of the same	CPCB is requested to kindly direct the TGPCB to conduct the study review the data and present the facts since the analysis is based on last 6 months data while this site existing since last 20 year



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CENTRAL GROUND WATER BOARD
MINISTRY OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION
GOVERNMENT OF INDIA

ASSESSMENT OF GROUND WATER CONTAMINATION
IN THE VICINITY OF MUNICIPAL SOLID WASTE DISPOSAL SITE,
JAWAHARNAGAR, HYDERABAD, TELANGANA STATE
(AAP: 2011-12 & 2012-13)



Dr.P.N.RAO
Supdt. Hydrogeologist

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By

Dr.P.N.RAO
Supdt. Hydrogeologist

Southern Region, Hyderabad
April, 2016

Southern Region
GSI Post, Bandlaguda
Hyderabad – 500 068
Telangana
Tel: 040-24225200
Email: rdsr-cgwb@nic.in

Ministry of Water Resources
Government of India
NH – IV, Faridabad
Haryana
Tel: 0129-2418518
Website: www.cgwb.gov.in



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CONTRIBUTORS

Principal Author

Dr.P.N.RAO
Supdt. Hydrogeologist

Sampling

G.Ravi Kumar, Sc-C
Y.Satya Kumar, Asst.Chemist

Geophysical Surveys

T.Raja Babu, Sc-D
P.H.P.Reddy. Sc-D
S.Renuka, Sc-B

Report Processing & Issuance

G. Y. Setty, Sc-D
S.Renuka, Sc-B(GP)

Chemical Analysis & Inputs

K.Maruti Prasad, Sc- B

Map Generation

B.J.Madhusudhan, AHg
P.Srinivasa Rao. Draftsman

Overall Supervision

N.Varadaraj Regional Director (Rtd)
G.Sudarshan, Regional Director (Rtd)

Issued under Guidance of

A.D.Rao, Regional Director

CENTRAL GROUND WATER BOARD
MINISTRY OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION
GOVERNMENT OF INDIA

Southern Region, Hyderabad
April, 2016

Executive Summary

A study has been carried out during AAP 2011-12 & 2012-13 at municipal solid waste disposal site, Jawaharnagar, Keesara mandal, Ranga Reddy district, Telangana State to evaluate the status of contamination of uncontrolled waste disposal on surface and ground water in the downstream of dumping site. The study also aims to assess the spatial and temporal variations of chemical constituents in ground water and to suggest remedial measures.

The unengineered solid waste dumping yard, spreads over an area of 750 acres and is located on topographic high (hill), between 17° 30' to 17° 32' N latitude and 78° 35' to 78° 38' E longitude. The average normal annual rainfall of is 753 mm. The area is situated in two mini watersheds namely Madyala vagu and Dammaiguda watersheds, in Musi sub-basin. Major surface water bodies (tanks) are Irlagutta tank, Cherial tank in Madyala vagu watershed and Dammaiguda tank in Dammaiguda watershed. Pediment (shallow, moderate), pediment inselberg complex, denudational hills are the major landforms. The area is underlain by granites of Archaean age. Ground water development is through bore wells with depth of 50 to 150 m, for drinking and irrigation purposes. The thickness of weathering ranges up to 18m, while the fractures are recorded up to a depth of 106 mbgl. The depth to water level ranges from 6.08 to 29.4 mbgl and 4.14 to 22.54 mbgl during pre and post-monsoon respectively. The seasonal water level fluctuation is to the tune of 1.94 to 6.86 m. The ground water flow is towards southeast.

Following hydrogeological surveys, a total number of 91 ground/surface water samples were collected during pre-monsoon and post-monsoon seasons (2011-12 & 2012-13) and analysed for major chemical constituents. During 2012-13, 15 samples each for BOD, COD, TOC, during both seasons were analyzed to ascertain the quality both spatially and temporally. In all 110 VES were carried out to supplement the hydrochemical data for accurate assessment of contamination. Two infiltration tests were carried out to know infiltration rates.

pH of ground water during 2012-13, ranges from 6.5 to 9 (pre-monsoon) and 6.49 to 7.38 (post monsoon) indicating neutral to alkaline nature. TDS values vary widely from 306 to 4654 mg/l and 223 to 5483 mg/l with average of 1163 and 1125 mg/l during pre monsoon and post monsoon seasons respectively. Concentration of cations Ca^{2+} , Mg^{2+} , Na^+ , K^+ during pre-monsoon, range from 30 to 441, 9 to 729, 28 to 405, 1 to 9 mg/l respectively with mean values of 133, 98, 147, 2 mg/l. During post-monsoon, they range from 11-1174, 15- 270, 19-421, 0 to 11 mg/l respectively with average values 126, 81, 158 and 2 mg/l respectively. The anions, HCO_3^- , Cl^- , SO_4 , NO_3^- varied from 85 to 476, 18 to 3120, 12- 144, 4 to 186 mg/l with mean values of 237, 538, 62, 38 mg/l respectively during pre-monsoon. They range from 12 -561, 25-3205, 1-330, 7-196 mg/l with average values of 112, 486, 127, 65 mg/l during post-monsoon. During pre-monsoon, the anion chemistry is dominated by chloride, constituting 9.58 to 89.04 % of total ions (average, 53.34%), followed by bi-carbonate constituting 9.32 to 82.38 % of total ions (average, 32.45%), sulphate constituting 0.79 to 16.16 % of total ions (average, 8.60%). Majority of samples belong to Ca-Mg-Cl- SO_4 water type.

During pre-monsoon (2012), significant values TOC (upto 345 mg/l) are observed in all the three tanks and in ground water samples indicating the presence of organic contamination. However, the concentrations got diluted significantly during post-monsoon in both surface water and ground water samples to the extent of 90%. BOD & COD are present in all the samples of surface water (tanks). In Irlagutta tank sample, concentration of as high as 18000 (COD) and 16000 (BOD) is observed indicating the extent of contamination. The BOD content in groundwater ranges from 35 to 330 mg/l and 2.8 to 28.8 mg/l during pre and post-monsoon respectively. The COD content in groundwater ranges from 64 to 360 and 20 to 80 mg/l during pre and post-monsoon respectively. However, like TOC these concentrations were also reduced considerably during post-monsoon due to fresh water inputs. Chloride is the dominant anion during both the seasons in ground and surface waters. Ca-Mg-Cl-SO₄ and Na-Cl are dominant hydrochemical facies in ground and surface water respectively.

Good correlation is observed between TDS-EC, Ca-Mg, Na-Cl, Mg-Cl, Ca-Cl, etc, which shows that all of them have same source of origin. It is pertinent to note that though low correlation exists between that EC and sulphate ($r=0.101$) during pre-monsoon season, significant positive correlation is seen during post-monsoon ($r=0.854$) suggesting addition of sulphate ions during monsoon. Good relationship between Ca²⁺ & Na⁺ ($r=0.649$ pre-monsoon; & 0.637 post-monsoon) indicates anthropogenic source. A positive correlation with Ca ($r=0.848$ pre-monsoon; & 0.904 post-monsoon), Mg ($r=0.915$ pre-monsoon; & 0.883 post-monsoon), Na⁺ ($r=0.741$ pre-monsoon & 0.0839 post-monsoon), Cl⁻ ($r=0.996$ pre-monsoon & 0.0994 post-monsoon) suggests that aquifer chemistry is mainly controlled by Ca, Mg, Na⁺ and Cl⁻ ions.

Spatial distribution maps indicate high concentrations of chemical constituents around dumping site and cherial tank during both the seasons. High nitrate concentration(>45 mg/l) occur in southern catchment (Dammai catchment) during both the seasons. There is lot of variability in concentrations, both temporally and spatially, which can be attributed to variations in rainfall, quantum and nature of waste, topography, groundwater flow dynamics etc.

Majority of groundwater samples are not fit for drinking purpose due to high concentration of one or more constituent in downstream of dumping site. During pre-monsoon (2012), the groundwater falls in C₂S₁(28%), C₃S₁ (40%), C₄S₁ (12%, C₄S₂ (12 %), C₃S₂ class (4 %) indicating salinity hazard 'Medium to Very High' category and sodium hazard 'Low to Medium' category.

In all 110 VES were conducted to assess the status of contamination and evaluate geo-electrical characteristics. It is observed that the area extended along Madiyala village and around Pedacheruvu, cherial is characterized by resistivity between 5 to 25 ohmm and indicate the quality of water is deteriorated due to dumping site. On observing the polar diagram, it is inferred that the major axis of the fracture direction, near Cherial, lies in NW-SE direction, following the major lineament. It is also observed that the thickness of weathering is high along lineament zone ranging up to 27 m.

It is clearly evident from water quality monitoring that uncontrolled dump yard affected the surface and ground water quality as seen not only from high concentrations of TDS, cations and anions in surface water and TDS, Mg, Cl⁻, SO₄²⁻, NO₃⁻, Na⁺ in majority of groundwater samples, TOC, BOD, COD and low HCO₃/Cl, high SO₄/HCO₃, low TA/TH ionic ratios. As there is no natural or other possible reasons for such high concentrations of these pollutants within short distance, it can be concluded that leachate has significant adverse impact on waters

particularly on surface water quality. The presence of contaminants in groundwater even at a distance of 4 km from dumping site amply support the contention that groundwater too is adversely affected by dumping site. Geophysical investigations also corroborates the impact of leachate around cherial tank. Due to heterogeneous nature of country rocks, the lateral and vertical flow of water is slow and complex and this, to a certain extent, restricts the movement of contaminants to certain pathways through fractures and thus the distribution of contaminants is uneven. The leachates are the prime sources of all ions in the groundwater, though meagre lithogenic inputs from rock–water interactions contribute. The influence of leachate percolation is much evident on the surface water bodies and some vulnerable locations. Various factors like soils, topography, and groundwater flow dynamics have largely controlled the migration of leachate to the groundwater system. The study has brought to light the vulnerability of site to the contamination of waters to leachate effect and the need for a proper solid waste management as a long-term policy which should primarily focus on identification of proper sites where the vulnerability to pollution could be minimal.

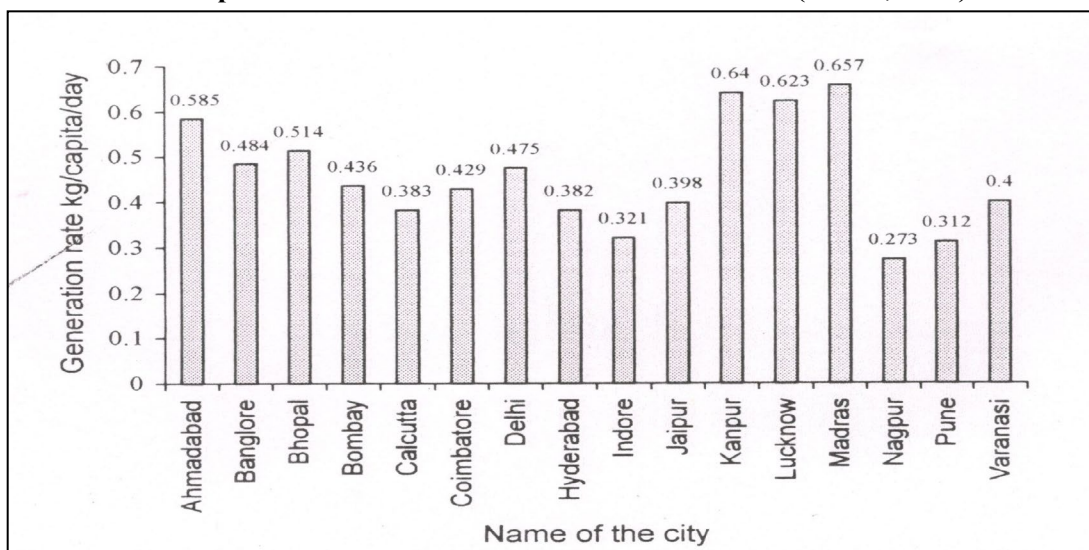
ASSESSMENT OF GROUND WATER CONTAMINATION IN THE VICINITY OF MUNICIPAL SOLID WASTE DISPOSAL SITE, JAWAHARNAGAR, HYDERABAD, TELANGANA STATE

1. INTRODUCTION

1.1 Background

Rapid industrialization and population explosion in India has led to migration of people and urbanization, which generated thousands of tons of municipal solid waste (MSW). Presently 90 million tons of solid waste is being generated annually in the country and it is estimated to increase at a rate of 1- 1.33 % annually. At present the collection, transportation and disposal of MSW is unscientific and chaotic. All the Indian cities dispose off their wastes simply by dumping whereas the environment friendly ways of disposal like composting, incineration constitutes only 9 %. Open, uncontrolled and poorly managed dump yards causes serious environmental degradation and MSW management is one of the major environmental problems of cities. The rate of generation of MSW, per day and per capita for the seven important metros are shown in Fig.1.1. Improper management of municipal solid waste causes hazards to inhabitants. Various studies reveal that about 90% of waste is disposed of unscientifically in open dumps and landfills, creating problems to public health and the environment.

Fig.1
Per Capita Generation Rate of MSW in Indian Cities(CPCB, 2004)



Hyderabad is a major Indian city with a population of more than six million. The municipal solid waste generated is estimated to be around 3800 tonnes per day. Earlier, the solid waste was disposed at several locations viz. Autonagar (near Hayatnagar), Gandhamguda (near Golkonda) and Amberpet, which are now abandoned. Presently, all the waste is disposed, for the past few years, in Jawaharnagar dumping ground, located about 35 kms from the city. Due to increased

urbanization, many residential colonies are coming up in this locality. Apart from these, Government has initiated projects like JNNURM housing complex, Rajiv Swagriha Complex near Jawaharnagar dumping site. Consequently, there has been a serious concern about the possible contamination of soil, ground and surface waters and its effect on local populace.

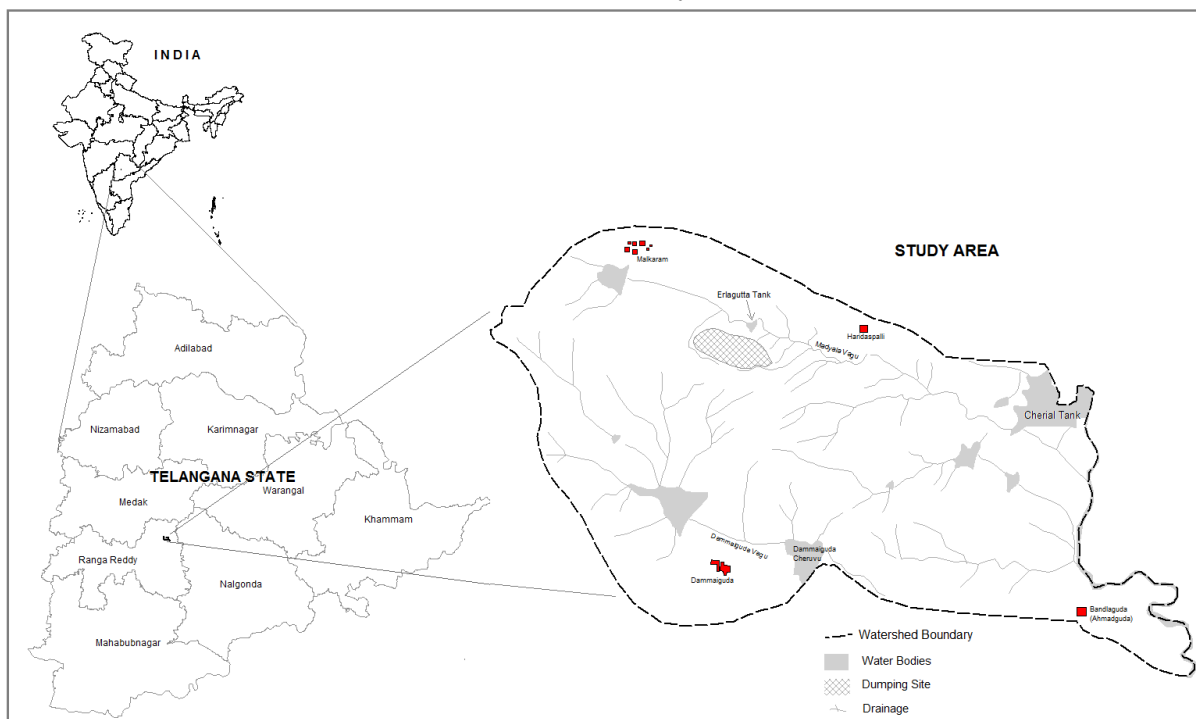
1.2 Objectives of study

- 1) To assess the contamination of uncontrolled waste disposal on surface and ground waters in the downstream of dumping site,
- 2) To study the spatial and temporal variations of each constituent,
- 3) Hydrochemistry of ground waters and
- 4) To suggest remedial measures.

1.3 Location & Extent

The MSW site (dumping yard site) spreads over an area of approximately 750 acres in Jawahar Nagar village, Keesara mandal, Ranga Reddy district (Fig.1.2). The study area is located on a topographic high (hill) situated at an elevation between 550 m and 630 m amsl, (peak, 633 m) covers about 17 sq km in and around MSW site ($17^{\circ} 30'$ to $17^{\circ} 32'$ N latitude and $78^{\circ} 35'$ to $78^{\circ} 38'$ E longitude), and falls in Survey of India toposheet No.56 K/10. The site is unscientific and non-engineered where approximately 3800 MT/day waste is dumped on the site (Fig.1.3).

Fig. 1.2
Location of Study Area



1.4 Source & Quantity of solid Waste in Hyderabad

The Hyderabad Urban Agglomeration (HUA) generates around 3800 tons of solid waste every day out of which MCH contributes 2040 tons and surrounding municipalities contribute 1139 tons at

a per capita generation rate of 600 gms/cap/day. The waste from different parts of the city are brought in trucks and dumped in irregular fashion. The major sources of solid waste generation in HUA are household domestic waste, commercial establishments, markets, hotels and restaurants, etc. the sources and quantity of solid waste generated in HUA is presented in Table-1.1.

Fig.1.3
Jawaharnagar Dump Yard and near by Polluted Pond



Table-1.1
Sources & Quantity of Solid Waste Generation in HUA (inTons)

S. No	Source of Generation	MCH		Surrounding ULBs	
		Quantity / day	%	Quantity / day	% to total
1	House Hold-Domestic	1482.00	66.18	690.45	60.60
2	Hotels and Restaurants	77.50	3.46	36.91	3.20
3	Markets	92.00	4.10	60.745	5.30
4	Shops. Commercial Establishments	347.10	15.51	112.25	9.90
5	Hospitals, Clinics	35.00	1.56	6.74	0.60
6	Construction Waste	20.00	0.90	22.725	2.00
7	Industrial Waste (Non-Hazardous)	12.00	0.53	60.7	5.30
Total		2240.00	100.00	1139	100.00

Source

1.5 Climate

Climate in the area is semi-arid with an average normal annual rainfall of 753mm. June to September is the period of rainy season (southwest monsoon) with occasional heavy rainfall

events. The contribution of southwest monsoon, northeast monsoon, winter and summer seasons are 547 mm (73%), 144 mm (19%), 12 mm (<1 %) and 50 mm (6.6 %) respectively. At Keesara, the year 2010 experienced high rainfall of 1080 mm, 2011 experienced low rainfall (422 mm). During 2012 the annual rainfall was 634 mm.

1.6 Methodology

1.6.1 Hydrochemical investigations

Following reconnaissance hydrogeological surveys, 19 sampling locations were selected in 2011 and depending upon the results, some additional locations were added during 2012. Ground water and surface water samples were collected during pre & post-monsoon seasons of 2011 & 2012. Random sampling method was employed to collect the groundwater samples from private sources and care has been taken to ensure that samples are collected in both affected and non-affected areas. More number of samples are collected in lower reaches (affected area) of study area. However, difficulty was experienced in locating wells just downstream of site, close to Madyala stream. The pH and EC were recorded on site at the time of sampling with digital pH meter and digital EC meter, respectively.

During 2011, a total of 19 water samples were collected during pre monsoon (2011) for analysis of major ions. These include 4 surface water samples (3 tank and 1 stream) and 15 ground water samples from shallow bore wells (<30 m depth). During post monsoon repeat sampling was done from 16 groundwater sampling locations (one sample extra) and 2 surface water samples. During 2012, 28 samples (25 ground water and 3 surface water) were collected during pre-monsoon and post monsoon seasons respectively for major constituents. In addition 15 samples were collected for analysis of TOC (Total Organic Carbon), BOD (Biological Oxygen Demand), COD (Chemical Oxygen Demand) and trace metals.

The samples were analyzed in Chemical laboratory of Central Ground Water Board, Southern Region, Hyderabad following standard procedures of APHA (1998). All the major constituents like pH, Electrical Conductivity (EC), Calcium (Ca^{2+}), Magnesium (Mg^{2+}), Sodium (Na^+), Potassium (K^+), Total hardness (TH), Bi-Carbonate (HCO_3^-), Chloride (Cl^-), Sulphate (SO_4^{2-}), fluoride (F^-), Nitrate (NO_3^-), were determined. The data was tested using the cations and anion balance method with samples lie with + or- 5 % error. BOD, COD and TOC were analysed following standard methods. Trace metals could not be analysed.

1.6.2 Geophysical investigations

A total of 110 VES were carried out in order to understand the weathering thickness and fracture pattern and quality of ground water in the area.

1.6.3 Infiltration tests

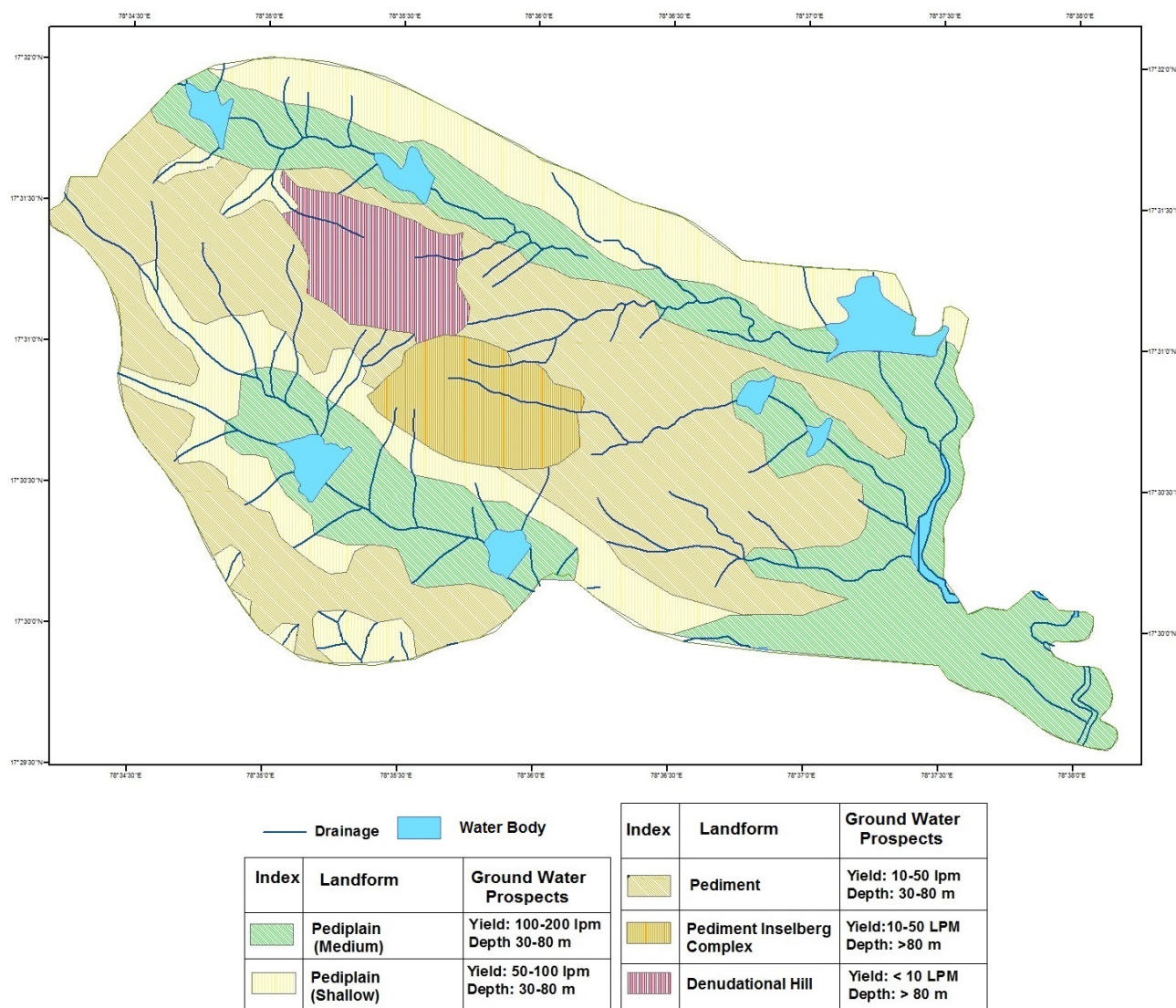
Three infiltration tests were carried out to know the soil infiltration rates.

2.0 GEOMORPHOLOGY & HYDROGEOLOGY

2.1 Landforms and soil

Pediment (shallow, moderate), pediment inselberg complex, denudational hills are the major landforms in the area (Fig.2.1). The major lineaments (5> km) mainly trend in NW-SE direction in northern and southern parts, while in east, lineaments trend in near N-S direction. The medium lineaments (>3-5 km) trend in NW-SE, NE-SW while minor lineaments(<3 km) mainly lie in N-S and near N-S directions. The soil is loamy in texture (2 m thick).

Fig.2.1
Geomorphology



2.2 Drainage

The study area falls in two mini watersheds viz: Madyala vagu and Dammaiguda watersheds. Madyala vagu stream, a 3rd order, originates west of Chimalaguda village about 5 km west of

MSW dumping site, flows in NW-SE direction and joins in Cherial tank, located 5 km SE of site, where it takes southern direction and joins Erimula vagu, which is a tributary of Musi river. Just south of MSW dumping site there is another micro watershed (Dammaiguda watershed). The major stream is of 4th order, which joins Dammaiguda tank, in southern side of study area. Major surface water bodies (tanks) are Irlagutta tank, Cherial tank in madyala vagu watershed and Dammaiguda tank in Dammaiguda watershed. The drainage is dendritic to sub-dendritic in nature.

2.3 Soil Infiltration Tests

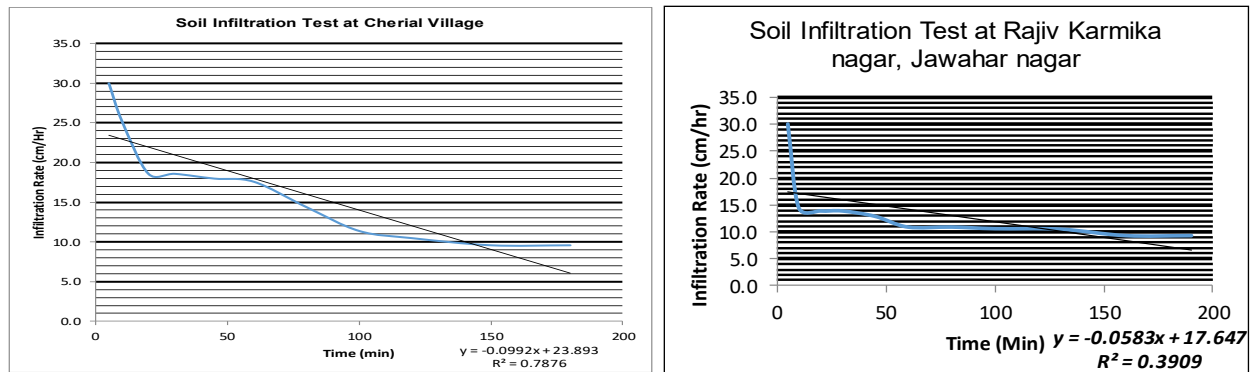
The water infiltration capacity depends upon soil characteristics. In order to know the infiltration capacity of soil, two infiltration tests are conducted using Double Ring Infiltrometer. The test results are given in the Table-2.1 & Fig.2.2. The infiltration rate is faster (i.e 29 cm/hr) at Madyala vagu (17 30 17: 78 36 16)), lower at Rajiv karmika Nagar (17 30 11: 78 35 06) (9.2 cm/hr) and Cherial village (17.5150:78 .61822) (9.6 cm/hr).

Table-2.1

Soil Infiltration Test at Cherial Village						
Date :	08.04.2013		Soil type :	Black sandy Soil		Zero level
Time	Depth (cm.)	Duration (min.)	Cumulative Duration (min)	Water Infiltrated (cm.)	Cumulative Infiltration (cm.)	Infiltration Rate (cm/hr.)
1125	9.5	0	0	0	0	0
1130	12	5	5	2.5	2.5	30.0
1135	11.6	5	10	2.1	4.6	25.2
1145	12.6	10	20	3.1	7.7	18.6
1155	12.6	10	30	3.1	10.8	18.6
1210	14	15	45	4.5	15.3	18.0
1225	13.9	15	60	4.4	19.7	17.6
1245	14.3	20	80	4.8	24.5	14.4
1305	13.3	20	100	3.8	28.3	11.4
1325	14.9	20	120	3.5	31.8	10.5
1355	14.3	30	150	4.8	36.6	9.6
1425	14.3	30	180	4.8	41.4	9.6

RK Nagar		District		Rangareddy	
Long 78°35'06" Lat 17°30'11"					
09.04.2013		Soil type :		Red Sandy Soil	
				Zero level 7	
Depth (cm.)	Duration (min.)	Cummilative Duration (min)	Water Infiltrated (cm.)	Cummilative Infiltration (cm.)	Infiltration Rate (cm/hr.)
7	0	0	0	0	0
9.5	5	5	2.5	2.5	30.0
8.2	5	10	1.2	3.7	14.4
9.3	10	20	2.3	6	13.8
9.3	10	30	2.3	8.3	13.8
10.2	15	45	3.2	11.5	12.8
9.7	15	60	2.7	14.2	10.8
10.6	20	80	3.6	17.8	10.8
10.5	20	100	3.5	21.3	10.5
12.2	30	130	5.2	26.5	10.4
11.6	30	160	4.6	31.1	9.2
11.6	30	190	4.6	35.7	9.2

Fig.2.2



2.4 Hydrogeology

The area is underlain by granitic rocks of Archaean age (Fig.2.3). These formations do not possess primary porosity and ground water occurrence is controlled by weathered and fracture zones. Ground water occurs under unconfined to semi-confined conditions. The development is through bore wells (depth of depth 50 to 150 mbgl), for drinking and irrigation purpose. The thickness of weathering ranges up to 18m, while the fractures are encountered down to a depth of 106 mbgl. The depth to water level ranges from 6.08 to 29.4 mbgl and 4.14 to 22.54 mbgl during pre and post-monsoon respectively. The seasonal water level fluctuation is to the tune of 1.94 to 6.86 m. Water table elevation varies from 500 to 560 m with gradient of 10 m/km. The flow of ground water is towards southeast (Fig.2.4 & 2.5).

Fig.2.3

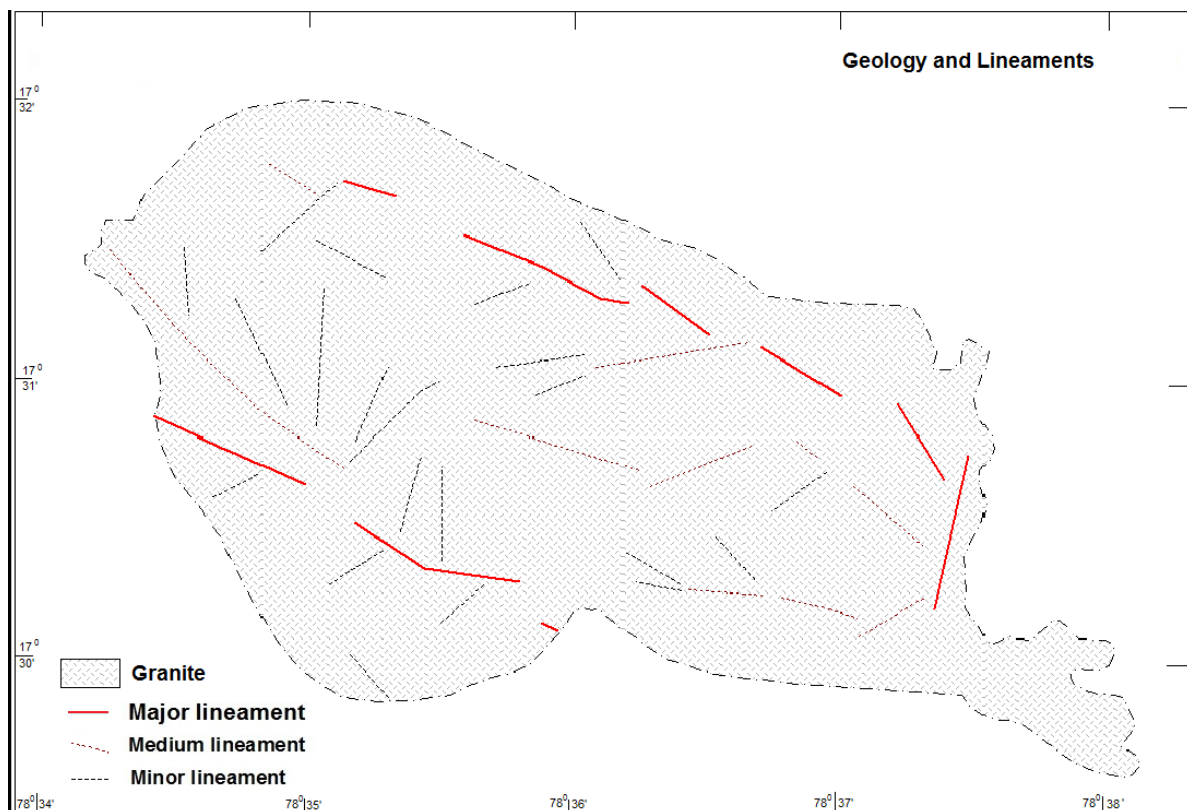


Fig.2.4

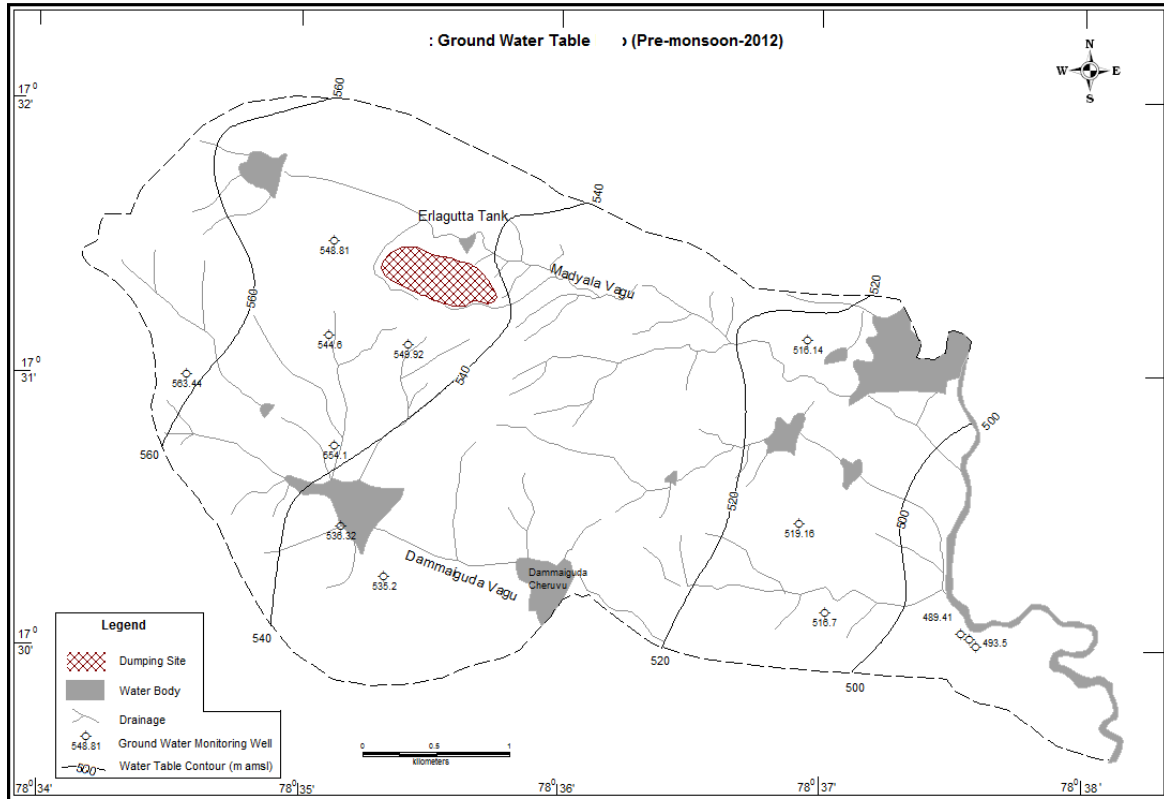
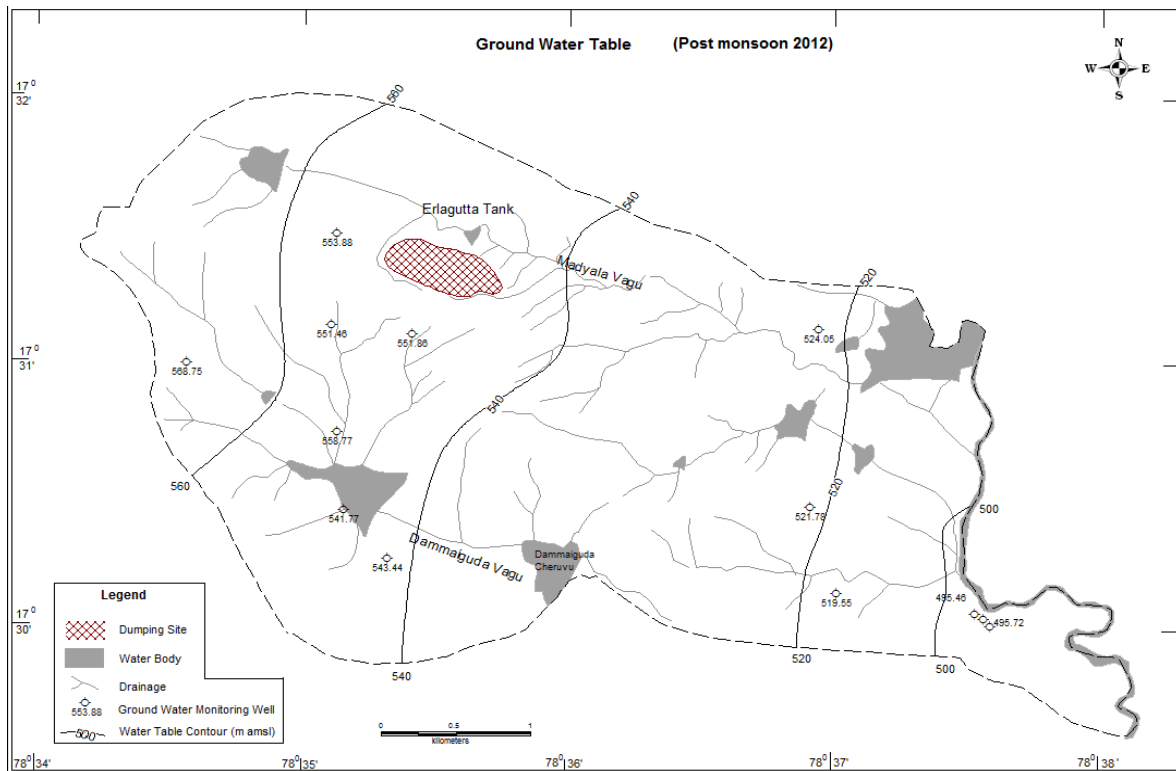


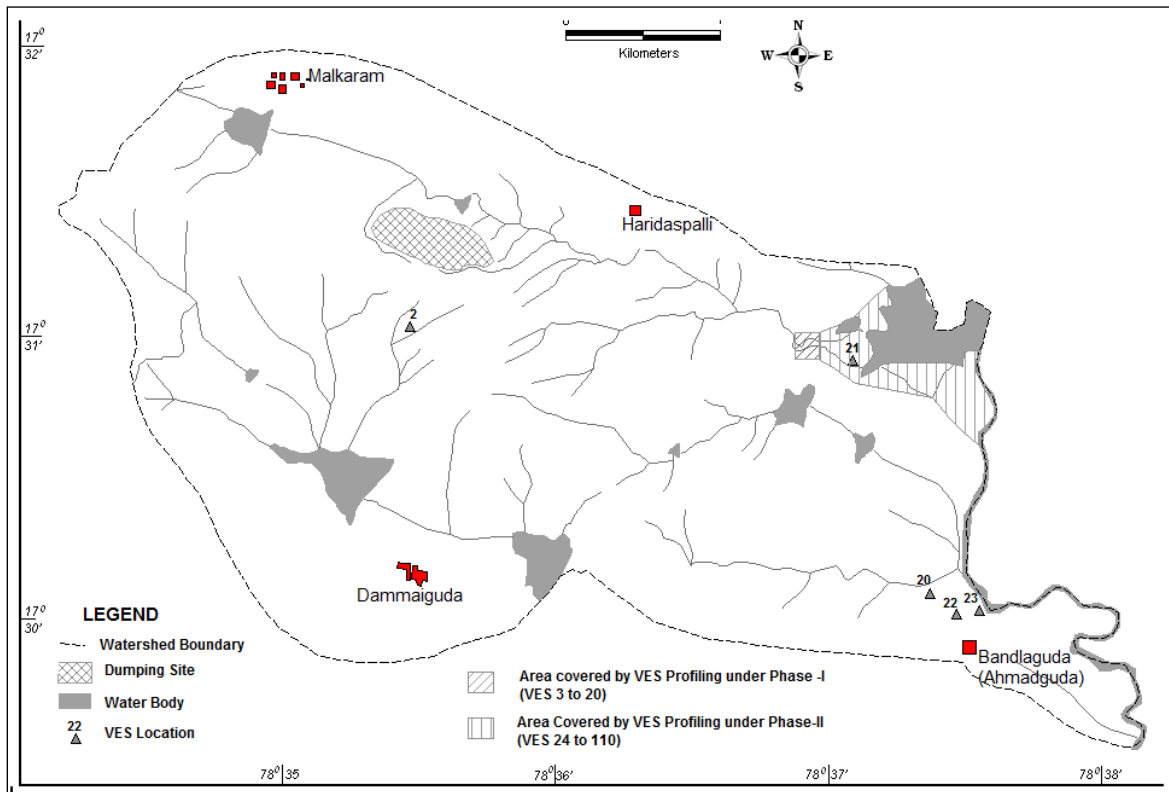
Fig.2.5



3.0 GEOPHYSICAL INVESTIGATIONS

Geophysical surveys were conducted to evaluate Geo– Electric characteristics and assess the extent of pollution. Altogether 110 resistivity soundings are conducted in two phases which include 23 VES during phase -I, (17 spread across the Madyala vagu, 2 spot soundings near the dump yard, 3 in Ahmedguda village, one at Cheryal village) and the remaining 87 VES are around cherial tank in phase II (Fig.3.1).

Fig.3.1
Location of VES, Phase – I & II



The field data is plotted on a double log sheet and the resultant field curves are interpreted manually using 3 layer master curves. Subsequently, the interpreted results are used for modelling employing IPI2WIN software and the best fits are considered for analysis. The field curves with the interpreted results of select resistivity soundings are given in Fig.3.2.

Fig.3.2
Interpreted results of select resistivity soundings

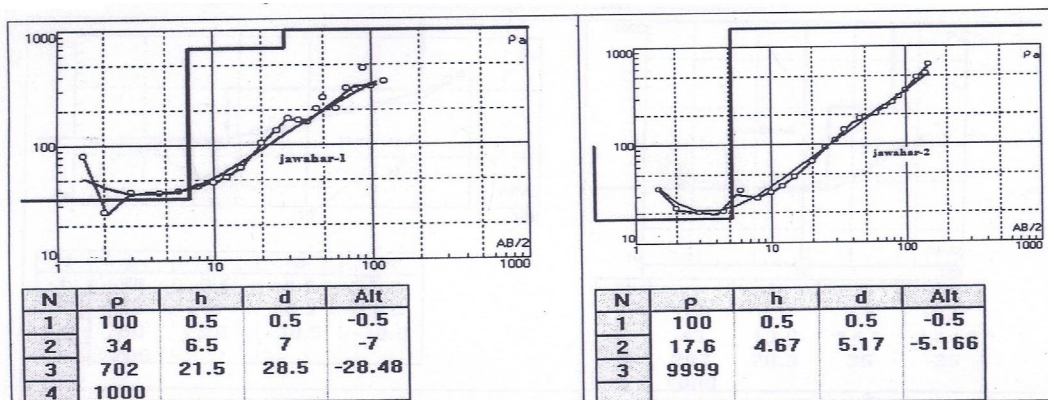


Fig.3.2
Interpreted results of select resistivity soundings

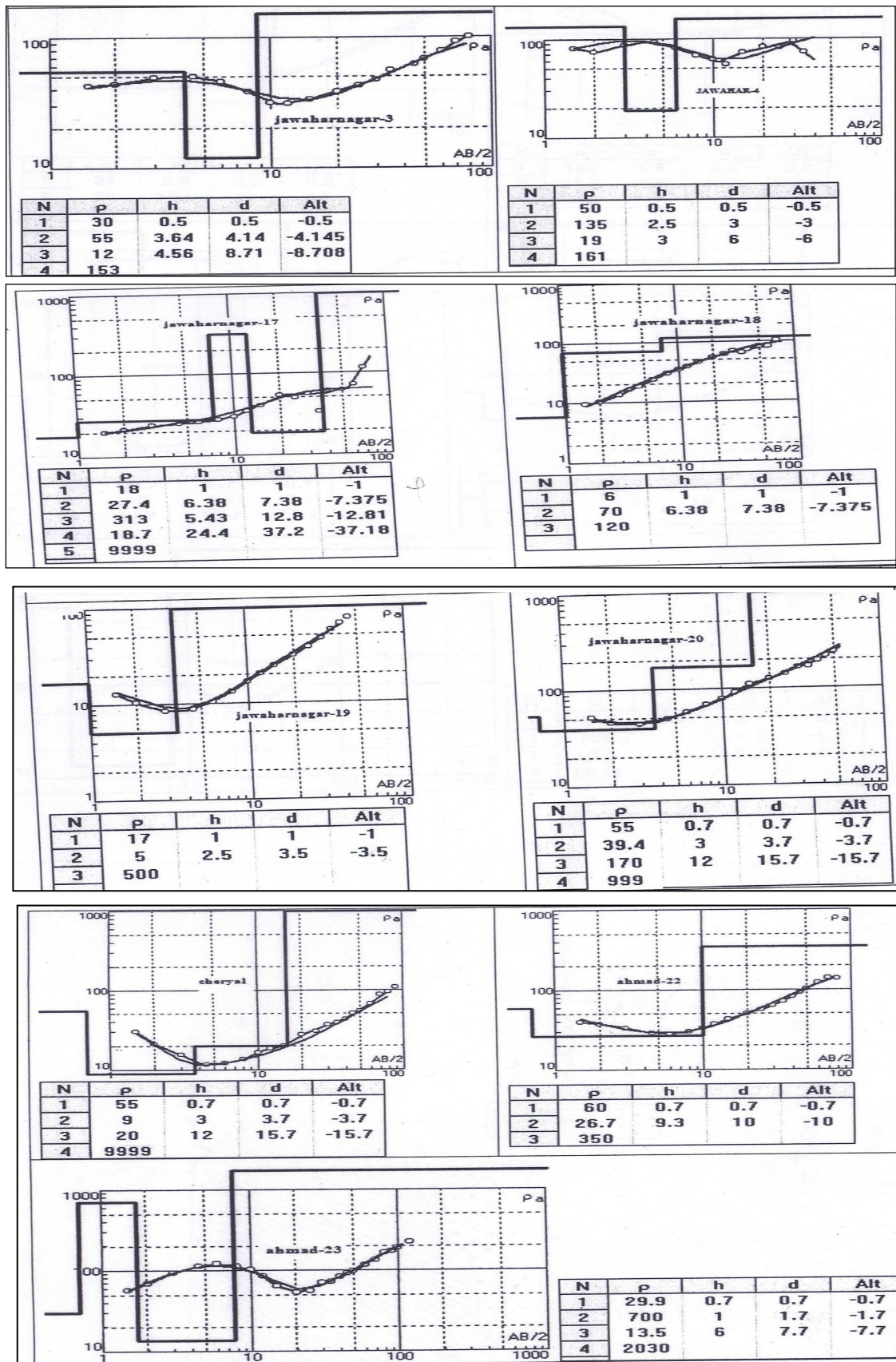


Fig.3.2
Interpreted results of select resistivity soundings

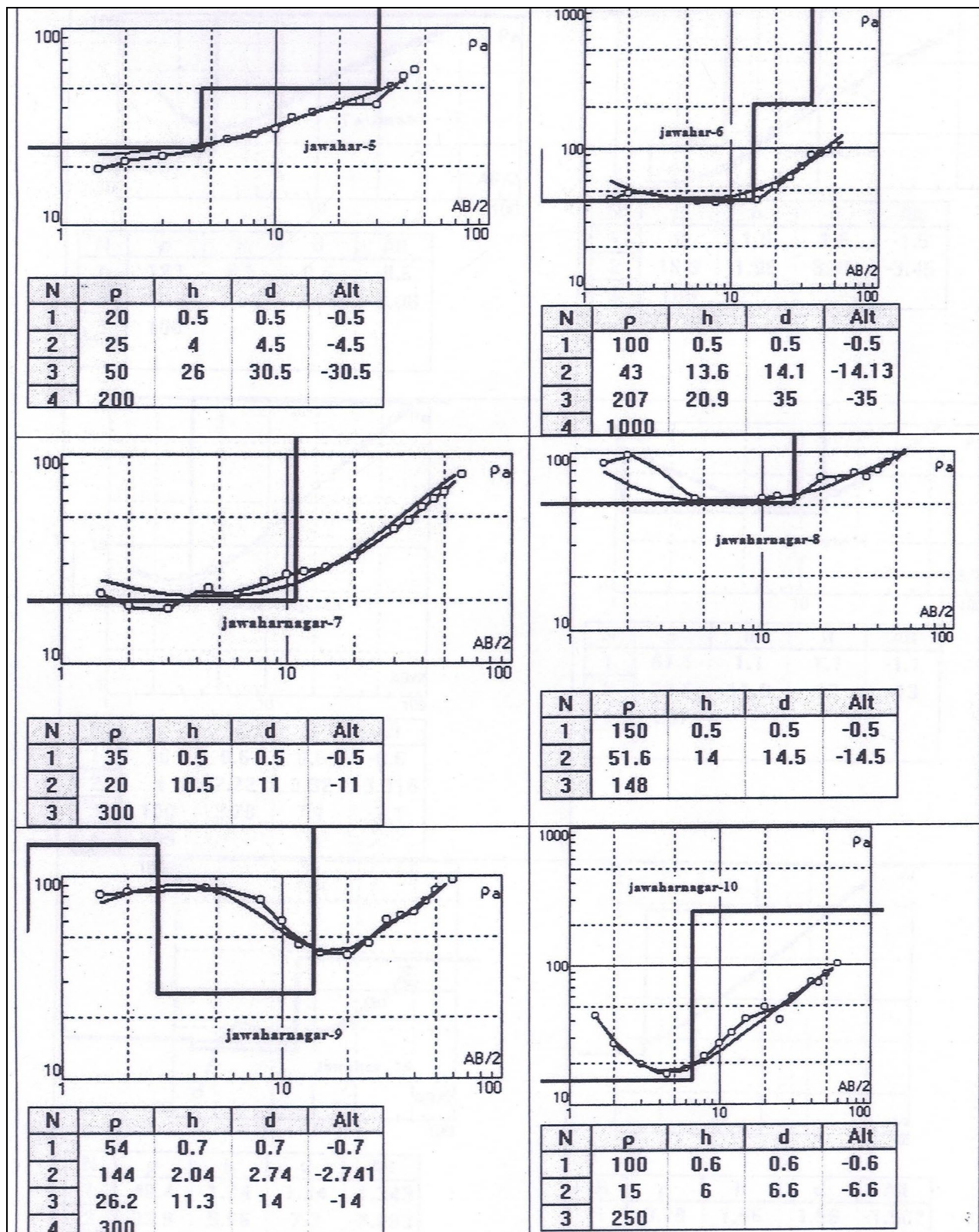
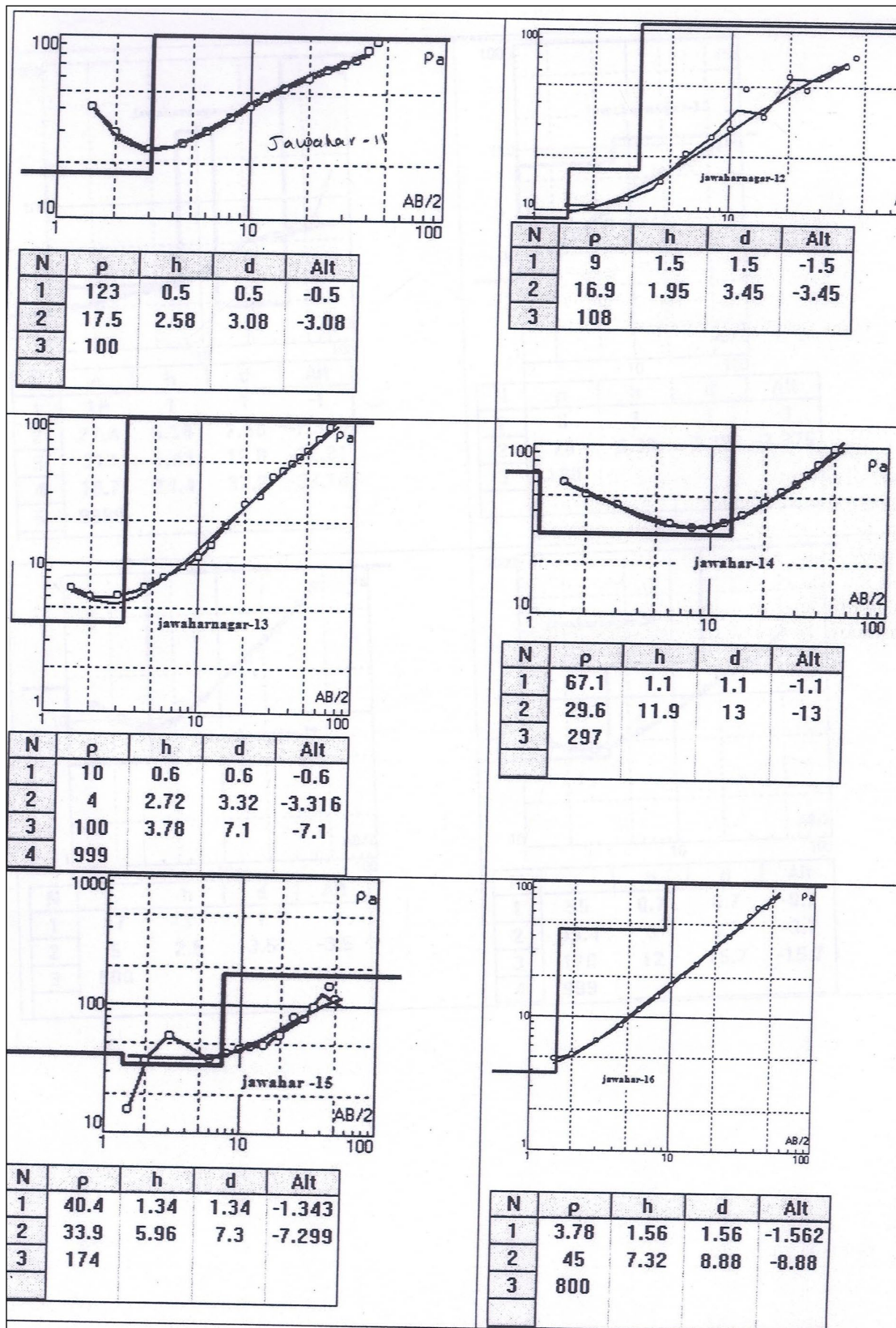


Fig.3.2
Interpreted results of select resistivity soundings



Results & Discussion

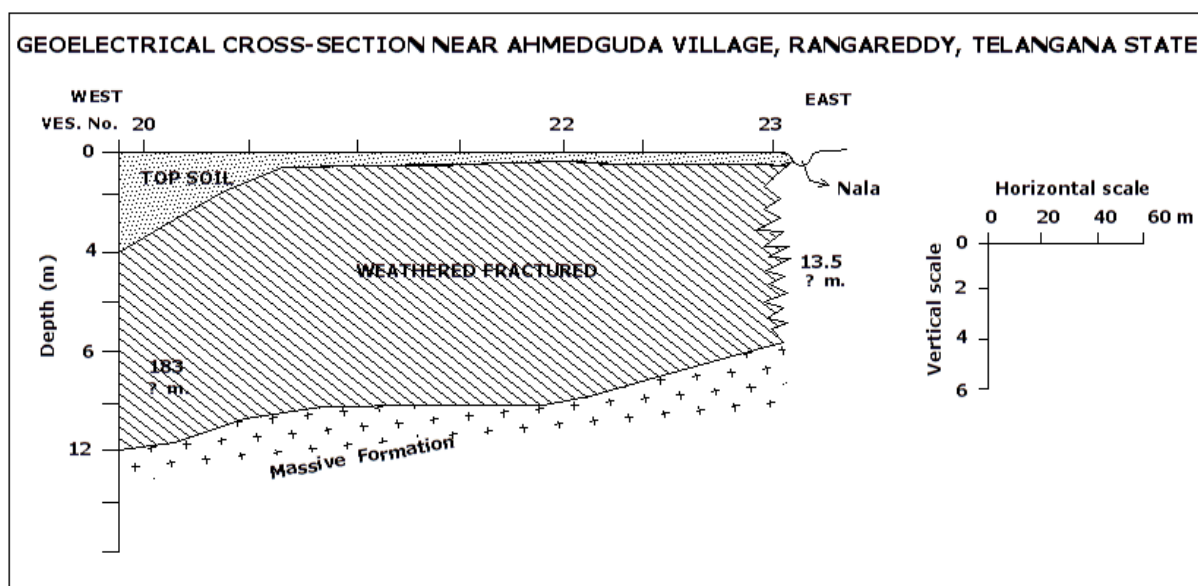
Near Dump yard

VES –1 and 2 were conducted in the near vicinity of dump yard where the surface is covered by sandy soil. The thickness of weathered zone at VES-1 (North of Dump yard) is 7 m with a resistivity of 34 Ohm m whereas at VES-2 (South of the Dump yard) the resistivity is 17 Ohm m with a depth extent of 5 m. the semi-weathered zone is extending up to 29 mbg at VES-1 followed by fractured zone. At VES-2 the weathered zone is followed by massive rock where minor fractures may encounter in deeper depths. The massive rock is showing a resistivity more than 1000 Ohm m.

Ahmdguda Village : VES –20, 22, 23

VES –20, 22, 23 were conducted near Ahmadguda village towards west of the nala. The distance from nalla to VES-23 is 15 m, VES-22 is 100 m and **VES-20** is around 300 m. The interpreted VES results are shown in the Geoelectrical Section (Fig.3.3). In VES –23 which is nearest to the nala, the weathered zone having a resistivity of 13.5 Ohm m with a thickness of 7 m appears to be completely polluted, whereas the resistivity of the same layer has increased to 26 Ohm m in VES-22 and 183 Ohm m in VES-20. This shows that the low resistivity near the nala is due to pollution from the nala water and the quality of formation water is improving away from the Nala.

Fig.3.3



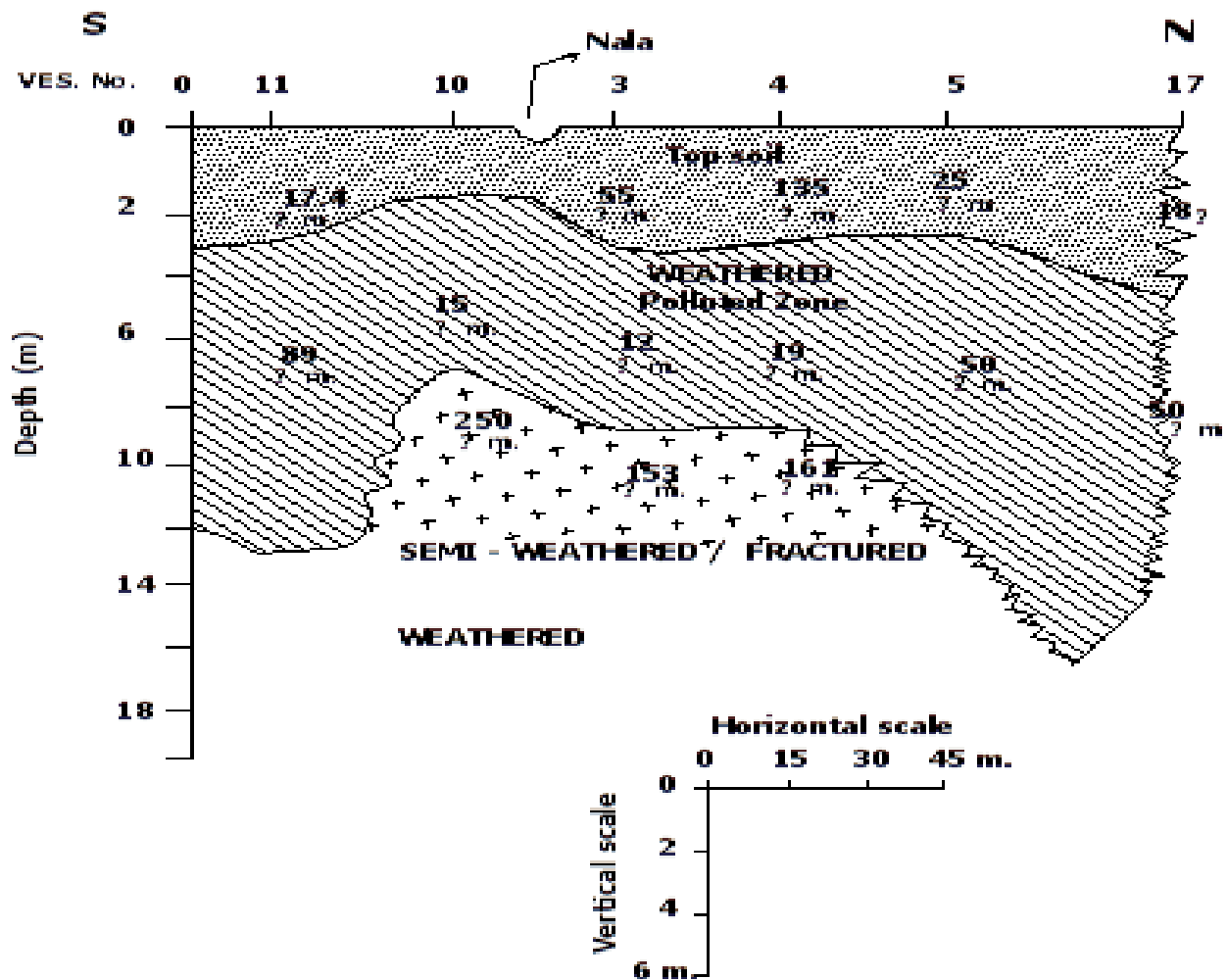
Cheryal Village: VES-21

The interpreted results of VES-21 conducted near the tank at Cheryal village, indicates that weathered zone is up to a depth of 16 m with resistivity of 20 ohm m. The resistivity shows the extent of deterioration of ground water quality around the tank, which is one of the main sources of water in the village.

VES PROFILES

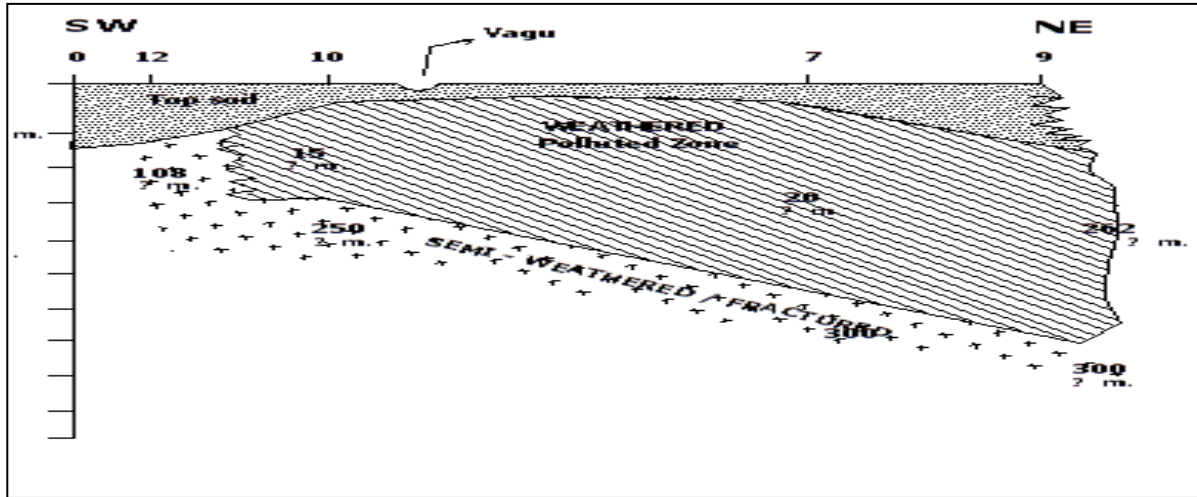
Geoelectrical cross sections and contour map (Fig.13,14,15) are generated from the interpreted results of resistivity soundings. The cross section (Fig.3.3) is drawn from the data obtained from VES Nos. 3, 4, 5, 11,10, & 17 in N-S direction, across the vagu between VES Nos.10 and 3. The resistivity of weathered layer vary from 12 to 89 ohmm. The resistivity of weathered layer vary from 12 to 19 ohm m in VES.10, 3, & 4 where as this has increased to 50 Ohm m in VES-5 and VES-17 in North and up to 89 ohm m in the south. Very low resistivity of 12 -19 ohm m is due to saturation of polluted water. The influence of vagu is around 60 m in the North where as it is 30 m in the southern side which may be due to higher elevation and less weathering. In this section the weathered zone is varying between 6-12m which gives the depth extent of pollution.

Fig.3.3
Geoelectrical Cross section across Vagu – N-S Direction



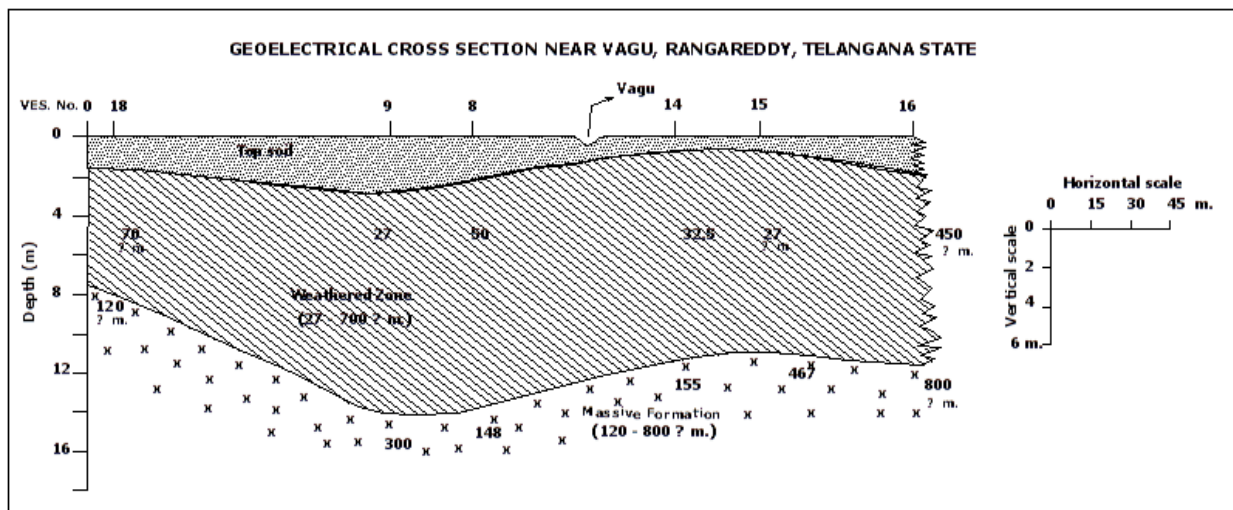
Another Geoelectrical cross section (Fig.3.4) is drawn with the data obtained from VES Nos. 12, 10, 7, 9 in NE-SW direction, with the Vagu flowing between VES-10 and VES-7. The effect of pollution can be seen at VES – 9 which is around 80 m away from the Vagu, as evident from the weathered layer resistivity of 26 Ohm m.

Fig.3.4
Geoelectrical Cross section across Vagu – SW-NE Direction



The Geoelectrical cross section depicted in the Fig.3.5 is generated using the data of VES Nos. 18, 9, 8, 14, 15 and 16. The resistivity of weathered zone is varying between 27 to 70 ohmm. Weathered zone resistivities are higher which may be due to less weathering nature as the sheet rock is seen as exposure. The resistivities below 35 Ohm m may be considered as polluted and above 35 ohm m is attributed to improved quality of saturated water. The second layer resistivity at VES-8 is 50 Ohm m and nearer to the Vagu, it is on the higher side. This may be due to the fact that the formation may be semi-weathered. The thickness of weathered layer is varying between 8-13m and leaching of pollutants is expected within this zone.

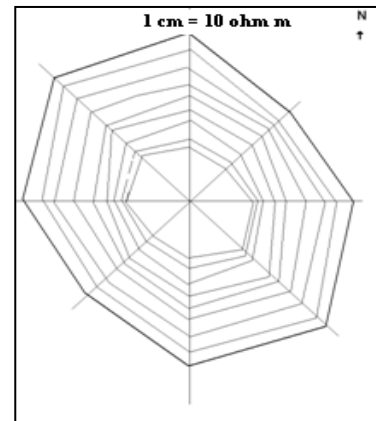
Fig.3.5



Polar diagram

To determine the electrical anisotropy of the area, four VES were conducted in four directions i.e., N-W, E-W, NE-SW and SE-NW at a select point, 300 m S 45 W degrees of Kattamaisamma temple, village Cheriya. The apparent resistivity values are plotted against AB/2 in each direction. Lines of resistivities of similarly placed AB/2 are joined to obtain consolidated polar diagram. It is inferred from the polar diagram that the major axis of the ellipse is obtained in N-W-SE direction, indicating the fracture (Fig.3.6). Based on the interpreted results of the VES data, thematic maps (Fig.3.6, 3.7 & 3.8) are generated to evaluate the extent of pollution.

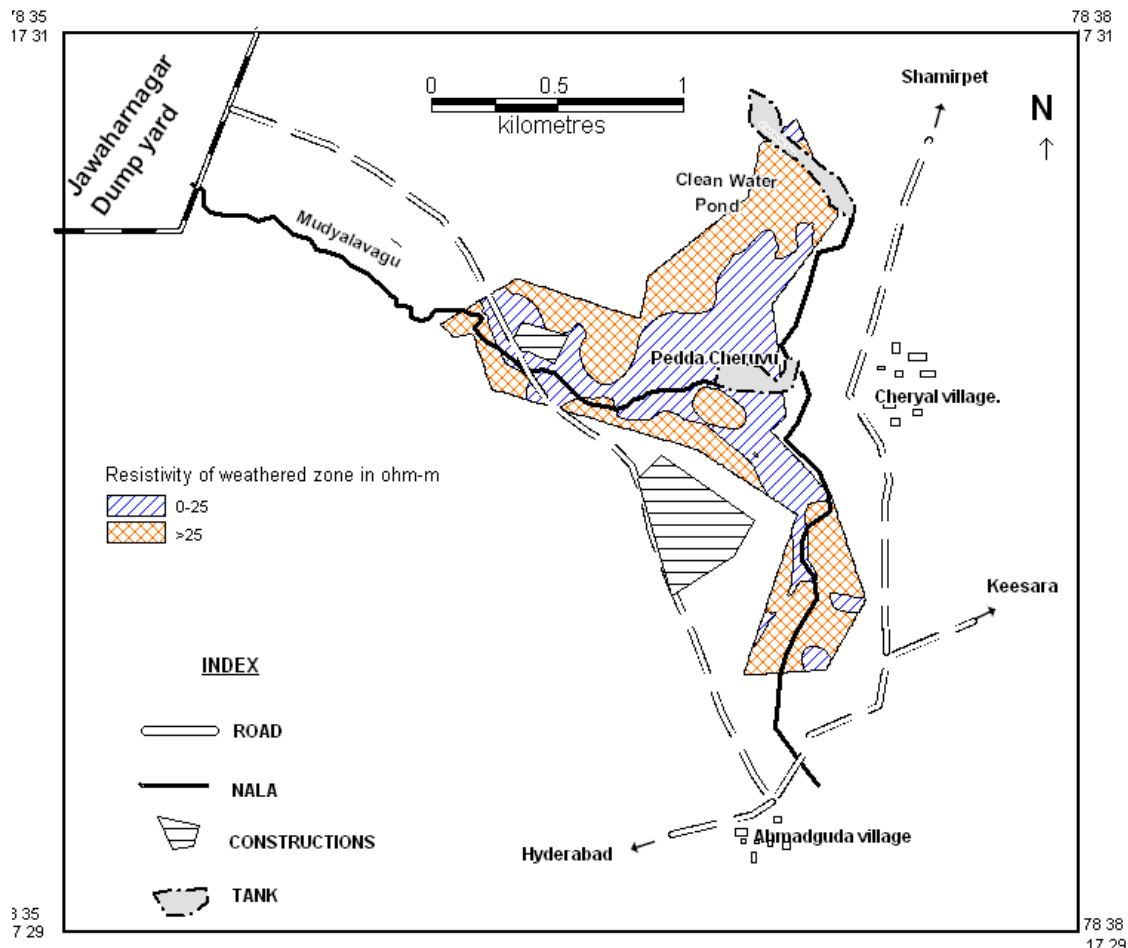
Fig.3.6
Polar diagram



1) Resistivity Map - Weathered formation

In order to understand the magnitude of pollution, resistivity contour map (Fig.3.7) in respect of weathered formation has been prepared. The weathered formation with resistivity between 5 to 25 ohm.m is attributed to polluted zone and quality of formation water is deteriorated. The formation with the resistivity >25 ohm.m classified as non-polluted and formation water is fresh. The area along Madiyala and Peddacheruvu villages is characterized by resistivity between 5 to 25 ohmm, and indicates their quality of water is deteriorated. However, the northern side with a resistivity >25 ohmm is devoid quality deterioration.

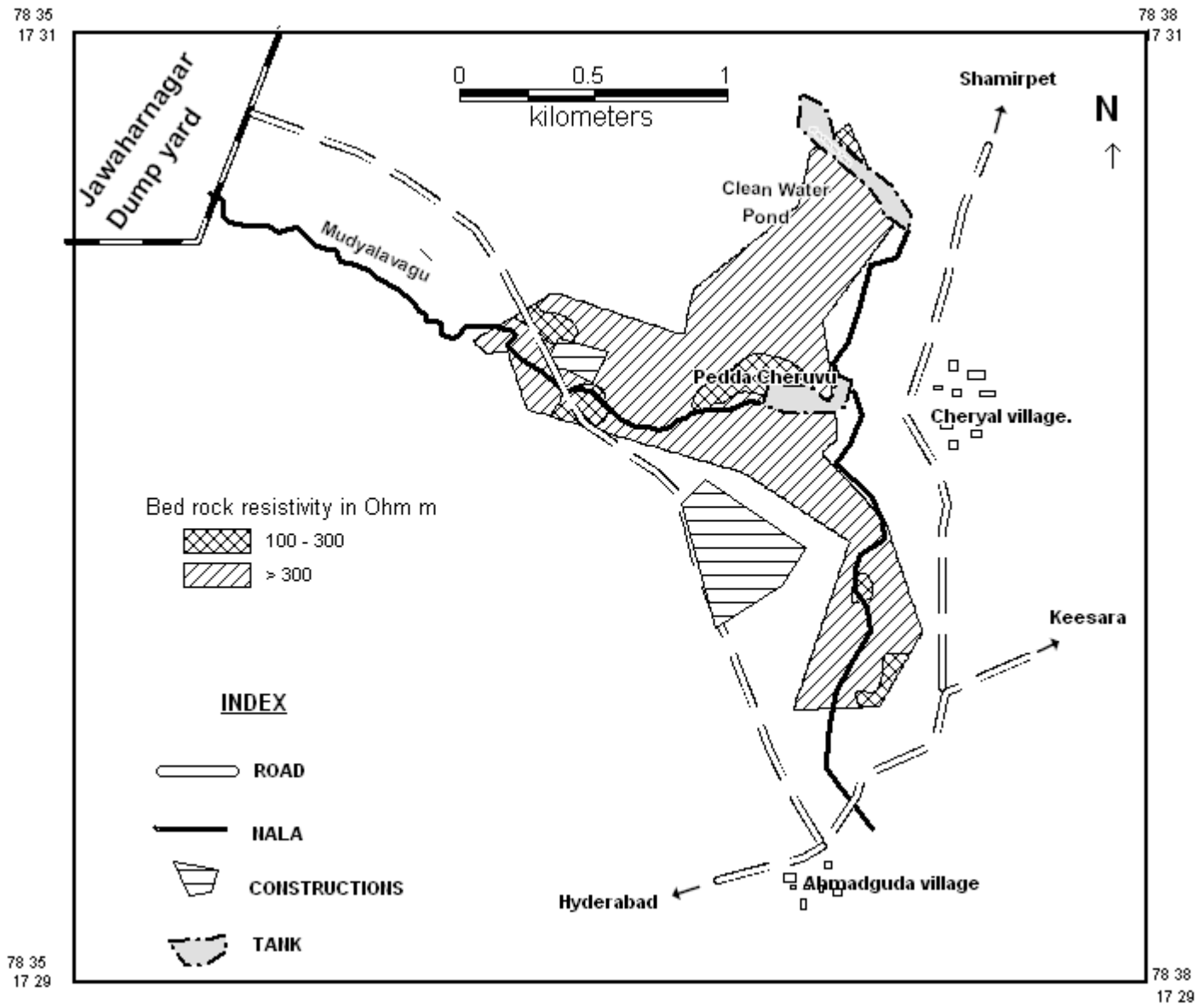
Fig.3.7
Resistivity Contour map - Bed Rock



2) Resistivity map - Bed Rock

Resistivity Contour map (Fig.3.8) is prepared to assess the nature of bed rock. It is observed that the formation with resistivity between 100-300 ohmm is fractured and more than 300 ohmm is massive. The fractures are existing in southern part of the investigated area and are not affected by pollution.

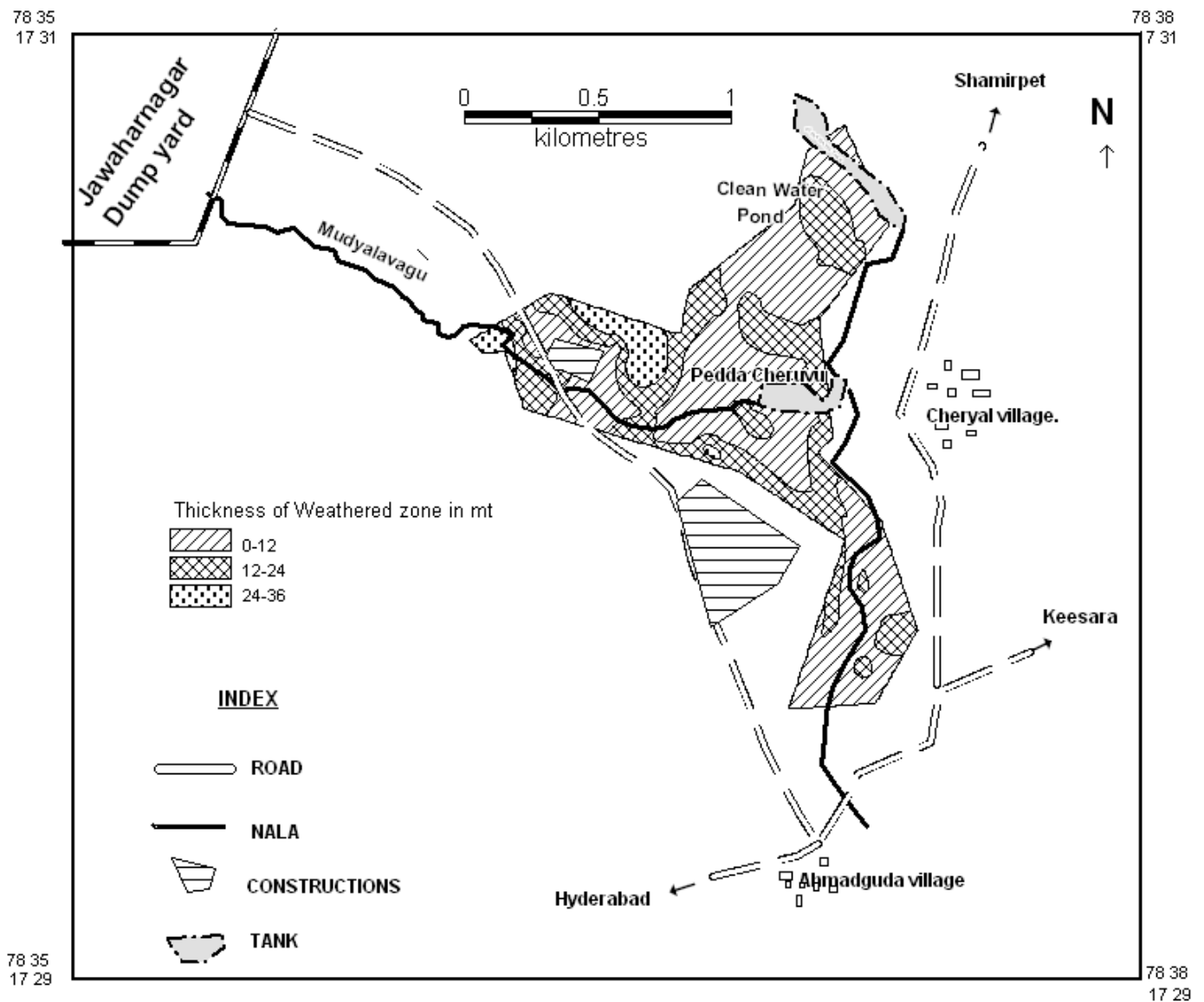
Fig.3.8
Resistivity Contour map - Bed Rock



3) Weathered layer thickness map

To ascertain the vertical extent of pollution in the weathered formation, a weathered layer thickness map (Fig.3.9) has been prepared. A perusal of the map reveals that about 70% of the area is covered by weathered layer of less than 12 m thickness where the resistivity is more than 25 ohmm. But in rest of the area where the thickness is more than 12 m and the resistivity values are less than 25 ohm, indicating the occurrence of pollution. The fracture zones in Peddacheruvu area are affected by pollution.

Fig.3.9
Thickness of Weathered layer



The following observations have been made based on resistivity surveys;

The studies have clearly brought out the geoelectrical characteristics of the formations in respect of ground water pollution. 3 to 4 geoelectrical layers are identified, where the first layer is taken as top soil with resistivities varying from 5 to 150 ohm m, the second layer resistivities are varying from 12 to 50 ohmm which can be attributed to the weathered formation. At places, this layer has high resistivity, 90 to 180 ohm m, which can be attributed to semi weathered/fractured formation, as seen at VES-11, 12 & 20. The last layer resistivities are in the range of 300 ohmm and more, which may be of massive nature.

The layer resistivities below water table (6 mbgl) vary between 12 to 50 ohmm. These are divided in to two groups.

- 1) **12 to 25 ohm m resistivity** : Formation saturated with polluted water from vagu which is evident from the results of VES in the vicinity of vagu.
- 2) **25 –50 ohm m resistivity** : Aquifer free from pollution.

The influence of pollution is more in the northern side of the vagu up to a distance of 60 m. whereas in the southern side it is up to 30m distance apart from nearby tanks. It reveals that the extent of deterioration of ground water quality along Madyala vagu, downstream of site and around the cherial tank.

4.0 HYDROCHEMICAL STUDIES

4.1 Physico-chemical characteristics of ground water

The locations of sampling sites, ground and surface water are shown in the Fig.4.1 and hydrochemical data during pre and post monsoon of 2011-12 are furnished in the Table-4.1A & 4.1B. The minimum, maximum, average and standard deviation of chemical parameters are given in the Table-4.2-A1 & 4.2-A2; 4.2-B1 & 4.2-B2.

Fig.4.1

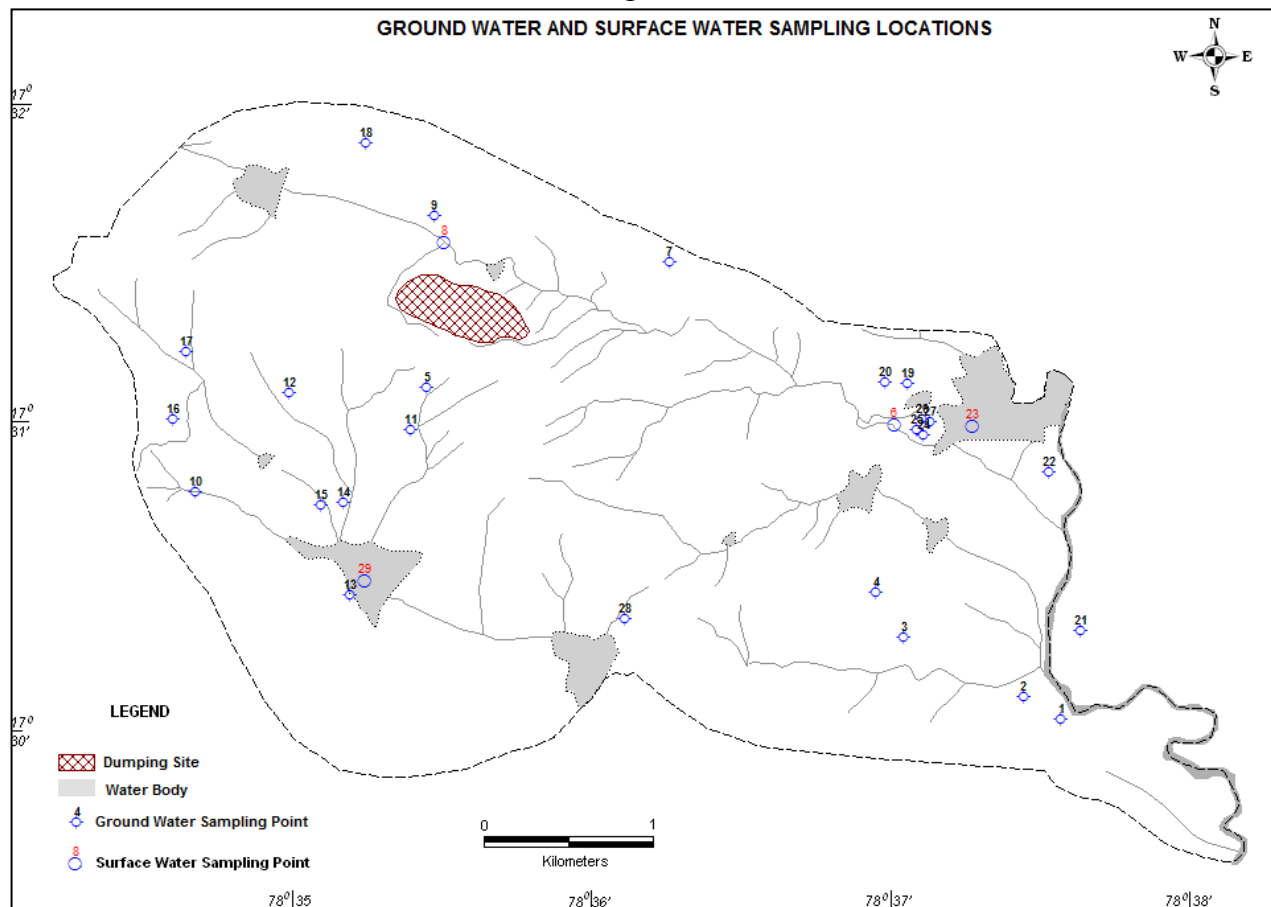


Table-4.1A-2011-12 (Pre monsoon)
Hydro chemical data of Ground Water & Surface Water around Jawaharnagar Dumping Site

S. No.	Location	pH	EC in μ S/cm	TH	Ca	Mg	Na	K	CO ₃	HCO ₃	Cl	SO ₄	NO ₃	F	TDS
mg/L															
1	JNNURAM Buildings	7.9	1491	470	156	19	120	0.8	0	543	142	77	8	1.10	855
2	HARIDASPALLI TANK	7.7	12220	1400	257	185	1840	860	0	2105	1999	1440	500	2.10	8367
3	HARIDASPALLI Village	7.5	2310	530	180	19	288	2	0	525	482	5	4	0.75	1301
4	IRLAGUTTA Tank	7.7	17640	1440	56	316	2128	2151	0	5368	1950	5	2000	1.30	11880
5	SANTHI NAGAR	7.3	3014	730	156	83	340	20	0	458	652	59	120	0.93	1710
6	NANDAMUI NAGAR	7.5	1101	410	144	12	46	1	0	183	145	24	160	0.92	645
7	ARMY COLLEGE	7.6	824	270	104	2.4	63	2	0	317	60	41	20	1.70	487
8	MALKARAM CROSS	7.4	1685	460	164	12	170	0.8	0	323	312	93	30	1.20	981
9	AHMEDGUDA SUBSTATION	7.5	756	260	96	4.9	59	0.8	0	372	32	19	20	1.30	460
10	BANDLAGUDA-AHMEDGUDA	7.5	1037	290	78	23	120	0.4	0	451	64	36	60	0.76	657
11	AHMEDGUDA(GP)/TEMPLE	7.4	1835	610	108	83	156	3.9	0	476	241	115	130	0.77	1128
12	KEESARA-BANDLAGUDA	7.4	2362	660	104	97	281	16	0	653	340	86	200	1.60	1525
13	PEDDA CHERUVU, CHERIAL	7.6	7094	660	120	87	943	860	0	1403	1773	19	150	1.60	4810
14	CHERIAL VILLAGE	7	3680	660	208	34	564	3.1	0	598	922	10	100	0.36	2205
15	KUNDANPALLI VAGU	7.6	4620	600	160	49	679	352	0	988	1134	10	100	1.40	3088
16	VENKATESWARA NAGAR	7.4	1434	410	152	7.3	140	0.8	0	348	184	84	100	0.56	882
17	DAMMALGUDA CHERUVU	7.6	2970	420	56	68	437	196	0	470	815	17	50	1.10	1926
18	NTR NAGAR	7.4	1570	570	116	68	115	0.8	0	415	241	93	50	1.10	938
19	RAJIV GANDHI KARMIK NAGAR	6.5	10540	1660	505	97	1725	8.6	0	1232	3049	19	100	0.27	6256

Table-4.1A-2011-12- post-monsoon
Hydro chemical data of Ground Water & Surface Water around Jawaharnagar Dumping Site

S. No.	Location	pH	EC in μ S/cm	TH	Ca	Mg	Na	K	CO ₃	HCO ₃	Cl	SO ₄	NO ₃	F
				←-----→ mg/L										
1	Dammaiguda Cheruvu	7.50	4510	580	88	87	575	313	0	226	1276	185	56	1.3
2	Ntr Nagar	7.40	1140	385	70	51	81	1.2	0	342	110	74	50	2.1
3	Rajiv Gandhi Karmik Nagar	6.49	3770	1200	417	39	322	1.2	0	500	1007	55	12	0.82
4	Rajiv Gandhi Karmik Nagar	7.18	1616	405	148	8.5	189	0.39	0	299	291	54	127	0.86
5	Venkateswara Nagar	7.33	1491	415	124	26	150	0.39	0	445	199	78	6.2	0.82
6	Ahmedguda Grave Yard	7.37	2082	780	136	107	117	1.2	0	519	326	130	14	
7	Cherial Village	6.75	3973	1020	393	9.7	460	3.5	0	567	1021	50	81	0.45
8	Pedda Cheruvu, Cherial	7.67	5958	720	88	122	690	665	0	1055	1446	101	68	1.2
9	Ahmedguda Substation	7.30	736	210	70	8.5	71	0.39	0	342	32	19	20	1.3
10	Jnnuram Buildings	7.42	1633	355	132	6.1	209	0.39	0	421	269	65	16	1.1
11	Haridaspalli Village	6.44	3479	1000	377	15	359	2.3	0	354	950	49	118	0.77
12	Irlagutta Tank	7.97	24170											
13	Malkaram Cross	8.10	1503	545	132	52	106	0.39	0	360	234	81	74	1.4
14	Santhi Nagar	6.65	3100	1140	409	29	198	2.3	0	390	780	102	20	1.0
15	Nandamsi Nagar	7.38	646	155	52	6.1	76	1.2	0	195	67	22	43	1.5
16	Army College	7.30	863	280	94	11	60	1.2	0	232	99	48	38	1.8
17	Bhagyanagar Colocy	7.17	576	220	68	12	28	0.39	0	201	32	35	35	1.5
18	Gabbilalpet	6.90	917	320	98	18	62	1.6	0	183	138	39	50	1.5
19	Ahmedguda(Gp)/Temple	7.13	1670	535	76	84	140	3.9	0	500	188	110	65	1.1

Table-4.1B - Pre monsoon - 2012-13
Hydro-chemical data of Ground Water & Surface Water around Jawaharnagar Dumping Site

S. No.	Location	pH	EC In $\mu\text{S/cm}$	Turbidity (NTU)	TH	Ca	Mg	Na	K	CO ₂	HCO ₃	Cl	SO ₄	NO ₃	F	TDS
										mg/l						
1	Ahmedguda kaman	7.96	1900	5	610	50	118	184	9.4	0	476	312	122	72	0.90	1158
2	Malsamma temple	8.15	1200	6	385	50	63	124	2.0	0	403	138	75	62	0.96	762
3	Ahmedguda/ Bandlaguda	8.17	744	5	270	30	47	71	0.8	0	366	35	28	40	0.97	477
4	Aqua house Iaxminagar colony	8.04	475	4	140	38	11	58	1.2	0	262	18	12	7	0.95	306
5	Masjid Rajivrukaipa JNNURM	7.10	9098	30	4000	401	729	262	2.0	0	122	3120	35	31	0.33	4654
6	Madyalavagu	7.79	1762	8	575	128	62	131	1.6	0	153	461	63	10	0.70	951
7	Haridaspaill	7.54	2510	6	860	253	56	184	3.9	0	85	737	123	28	0.70	1438
8	Iralagutta	8.34	90560				Highly viscous and coloured sample									
9	MalakaramXRoads Jami Masjid	7.48	3150	9	1240	236	158	179	1.2	0	220	922	136	17	0.68	1784
10	Bhagaya nagar col	8.06	859	7	340	56	49	46	0.8	0	275	78	50	59	1.90	508
11	E.Nandamuri colony	7.90	725	10	265	92	9	46	1.2	0	159	96	46	58	1.30	445
12	Gabbilapeta	7.97	1042	4	435	138	22	51	1.2	0	153	152	43	186	1.02	688
13	NTR colony ambedkarnagar	7.83	1200	7	445	68	67	97	1.2	0	287	174	94	89	1.02	765
14	Rajiv Karmika nagar	7.18	4864	20	1480	441	92	405	1.2	0	146	1489	110	28	0.41	2656
15	Rajiv Karmika nagar- Ven.brick	7.52	1944	5	705	200	50	106	0.8	0	98	521	59	67	0.85	1064
16	Indubhavanor	7.96	508	10	225	56	21	28	1.2	0	220	39	32	12	1.84	324
17	Rajiv swagrua,Ahmedguda	7.83	526	7	200	60	12	35	1.2	0	171	50	43	24	1.50	331
18	Malakaram	7.84	610	9	230	54	23	46	3.1	0	201	64	39	33	1.84	388
19	JNNURM Buildings	7.54	1447	10	505	106	58	108	1.2	0	250	326	66	4	0.62	823
20	Near JNNURM	8.01	578	12	200	34	28	55	1.2	0	275	35	24	21	1.36	368
21	Cherital XRoad	7.82	1946	6	325	50	49	322	1.2	0	348	404	144	14	1.36	1197
22	Cherital village	7.30	2332	7	890	208	90	133	2.7	0	134	695	53	43	0.36	1308
23	Cherital Tank	7.88	11390	40	800	100	134	1495	1212	0	299	2907	1008	229	1.41	7269
24	Near Cherital Tank	7.23	4278	9	1390	192	221	322	3.9	0	299	1276	22	25	0.12	2245
25	Near Cherital Tank	7.31	4358	8	1480	216	228	294	3.1	0	220	1347	31	11	0.41	2266
26	Near Cherital Tank	7.93	1560	5	370	50	60	189	2.0	0	348	312	53	3.7	1.41	882
27	Near Cherital Tank	7.65	2236	3	760	112	117	196	2.3	0	262	638	59	4	0.84	1289
28	Venkateswara nagar	7.58	1351	25	465	106	49	92	0.8	0	171	209	87	179	0.23	827

Table-4.1B- Post-monsoon-2012-13
Hydro chemical data of Ground & Surface Water around Jawaharnagar Dumping Site

S. No.	Lab. R.No.	Location	pH	EC in μ S/cm	Turbidity (NTU)	TH	Ca	Mg	Na	K	CO ₃	HCO ₃	Cl	SO ₄	NO ₃	F	TDS
mg/L																	
1	1448/12	Ahmedguda Kaman	7.47	2320	5	840	112	136	140	11	0	561	312	101	190	0.99	1346
2	1449	Maisamma temple, Ahmedguda	8.67	1360	7	430	24	90	113	2.3	72	98	199	129	78	0.70	738
3	1450	Ahmedguda/Bandlaguda	8.85	860	3	193	14	38	108	0.2	36	64	78	84	147	0.49	530
4	1451	Aqua House, Laxminagar Colony	8.94	440	5	108	19	15	51	0.8	33	101	25	30	20	0.92	241
5	1452	Masjid, Rajiv Grihakalpa, Ahmedguda	7.23	9920	40	4040	1174	270	421	2.1	0	73	3205	330	36	0.25	5483
6	1453	JNNURM Madyalavagu	8.50	1220	9	350	56	51	117	1.0	9	43	305	117	7	0.75	686
7	1454	Haridasalli	7.91	2100	7	640	168	53	184	4.6	0	85	567	160	12	0.55	1203
8	1455	Irlagutta tank	9.06	3230	54	460	56	78	440	153	120	85	695	279	85	0.74	1911
9	1456	Malkaram X roads	8.20	2070	6	800	128	117	107	0.8	0	98	567	125	28	0.92	1132
10	1457	Jama Masjid, Bhagya Nagar colony	8.66	1100	7	425	52	72	55	0.6	24	49	160	125	139	1.70	649
11	1458	E.Nandamuri Colony	8.48	900	5	268	72	21	82	0.6	18	64	151	92	72	0.78	541
12	1459	Gabbilalapeta	8.20	1100	9	445	100	47	46	0.8	0	79	170	82	196	0.68	692
13	1460	NTR Colony, Ambedkar nagar, Dammaiguda	8.87	1290	10	420	38	79	101	0.6	48	61	184	137	136	1.03	743
14	1461	Rajiv Karmika Nagar	8.11	2330	6	600	180	36	258	0.6	0	73	567	205	108	0.66	1401
15	1462	Rajiv Karmika Nagar-II	8.07	1420	7	485	152	26	102	0.6	0	49	277	117	193	0.64	897
16	1463	Venkateswara Brick Industry, Bhagya nagar Colony	8.83	420	8	165	31	21	19	1.0	24	61	43	39	22	1.43	230
17	1464	Rajiv Swagruha, Ahmedguda	8.66	510	5	180	33	24	32	0.8	12	92	53	65	19	0.88	291
18	1465	Malkaram	8.60	470	4	140	24	19	41	2.6	39	12	37	73	37	1.67	267
19	1466	Near JNNURM	8.01	610	7	205	35	29	44	0.8	0	275	43	1	25	1.13	345
20	1467	Cherial X Road	9.00	1680	6	230	20	44	278	1.0	48	134	337	159	8	1.25	958
21	1468	Cherial Village	7.95	3470	12	1080	240	117	299	2.6	0	73	978	244	44	0.28	1970
22	1469	Cherial Tank	8.77	1510	21	225	36	33	192	86	60	85	298	146	12	0.58	892
23	1470	Near Cherial Tank	8.02	4260	48	1220	144	209	415	4	0	317	1191	152	36	0.13	2345
24	1471	Near Cherial Tank	8.51	3430	32	1030	96	192	313	3.1	48	49	943	234	20	0.14	1860
25	1472	Near Cherial Tank	8.20	4620	10	1410	184	231	412	2.8	0	134	1390	218	10	0.32	2530
26	1473	Near Cherial Tank	9.04	1520	5	345	22	70	189	1.7	54	79	330	121	14.0	1.14	830
27	1474	Venkateswara Nagar	9.24	400	7	130	24	17	30	0.4	18	85	35	34	17	0.91	223
28	1475	Dammai Tank	8.79	4390	37	560	76	90	681	119	72	207	993	392	110	0.19	2630

Table-4.2-A1
Ground water quality around Jawaharnagar waste disposal site
Ranga Reddy District

Sl No	Parameter	Premonsoon 2011 (n=14)				Post-monsoon 2011(n=15)			
		Min	Max	Average	S.D	Min	Max	Average	S.D
1	pH	6.5	7.9	7.39	0.33	6.44	8.10	7.14	0.43
2	EC (in $\mu\text{s}/\text{cm}$)	756	10540	2550	2587	576	3973	1824	1839
3	TDS (mg/l)	484	6746	540	1655	369	2543	1177	754
4	TH (mg/l)	260	1660	564	361	155	1200	571	362
5	Ca ²⁺ (mg/l)	78	505.01	162.3	167	52	417	177	141
6	Mg ²⁺ (mg/l)	2.43	97.21	36	300	6.1	106.9	32	30
7	Na ⁺ (mg/l)	46	1725	300	451	27.6	460.0	163	126
8	K ⁺ (mg/l)	0	20	3	5	0	4	1	1
9	HCO ₃ ⁻ (mg/l)	183	1232	5480	252	183	567	370	125
10	Cl ⁻ (mg/l)	32	3049	502	807	32	1021	363	372
11	SO ₄ ⁻ (mg/l)	5	115	52	30	19	130	64	32
12	NO ₃ ⁻ (mg/l)	4	160	69	52	6	118	43	31
13	F ⁻ (mg/l)	0.27	2	1.0	0	0.45	2.1	1.2	0

Table-4.2-A2
Ground water quality around Jawaharnagar waste disposal site
Ranga Reddy District

Sl No	Parameter	Premonsoon 2012 (n=25)				Post-monsoon 2012(n=25)			
		Min	Max	Average	S.D	Min	Max	Average	S.D
1	pH	7.1	8.17	7.72	0.32	7.23	9.24	8.41	0.5
2	EC (in $\mu\text{s}/\text{cm}$)	475	9098	2074	1925	400	9920	1993	2035
3	TDS	306	4654	1163	976	223	5483	1125	1119
4	TH (mg/l)	140	4000	733	796	108	4040	647	796
5	Ca ²⁺ (mg/l)	30	441	133	112	14	1174	126	228
6	Mg ²⁺ (mg/l)	9	729	98	144	15	270	81	73
7	Na ⁺ (mg/l)	28	405	147	105	19	421	158	130
8	K ⁺ (mg/l)	1	9	2	2	0	11	2	2
9	HCO ₃ ⁻ (mg/l)	85	476	237	99	12	561	112	115
10	Cl ⁻ (mg/l)	18	3120	538	692	25	3205	486	683
11	SO ₄ ⁻ (mg/l)	12	144	62	38	1	330	127	76
12	NO ₃ ⁻ (mg/l)	4	186	38	39	7	196	65	64
13	F ⁻ (mg/l)	0.12	1.90	0.97	0.49	0.13	1.70	0.81	0.43

Table-4.2-B1
Surface water quality around Jawaharnagar waste disposal site
Ranga Reddy District

Sl No	Parameter	Premonsoon 2011				Post-monsoon 2011			Remarks
		Min	Max	Average	S.D	Min	Max	Average	
1	pH	7.6	7.77	7.65	0.06	7.5	7.97	7.71	EC recorded at Irlaguuta (24170) not considered, other parameters could not be analyse
2	EC (µs/cm)	2970	17640	9981	6355	4510	5958	5234	
3	TDS	1901	11290	6388	4067	3813	2886	3350	
4	TH	420	1440	980	518	580	720	650	
5	Ca	56.1	256.5	122.2	94	88.17	88.17	88.17	
6	Mg	68.1	316	164.1	113	87.49	122	104.5	
7	Na	437	2127.5	1336.9	784	575	690	632.5	
8	K	195.5	2150	1016.6	818	312	665	488.75	
9	HCO ₃	470	5368	2336	2129	225	1055	640	
10	CL	815	1999	1634	555	1276	1446	1361	
11	SO ₄	4.8	1440	370.2	713	101	184.8	55.8	
12	NO ₃	50	2000	675	904	55.8	68	62	
13	F	1.1	2.1	1.53		1.2	1.3	1.25	

Table-4.2-B2
Surface water quality around Jawaharnagar waste disposal site
Ranga Reddy District

Sl No	Parameter	Premonsoon 2012			Post-monsoon 2012			EC (90560) recorded at Irlagutta during pre-monsoon not considered, as other constituents could not be analysed.
		Min	Max	Average	Min	Max	Average	
1	pH	7.79	8.34	8.2	8.5	9.06	8.78	
2	EC (µs/cm)	1762	11390		1220	1510		
3	TDS	951	7269	4110	686	2630	1530	
4	TH	575	800	6875	225	580	399	
5	Ca	128	100	114.2	36	76	56	
6	Mg	62	134	97.8	33	90	63	
7	Na	131	1495	813	117	681	358	
8	K	1.6	1212	607	1	153	90	
9	HCO ₃	153	299	225.7	43	207	105	
10	CL	461	2907	1684	298	993	572	
11	SO ₄	63	1008	536	117	392	233	
12	NO ₃	70	229	120	7	110	54	
13	F	0.70	1.41	1.1	0.19	0.75	0.6	

pH, EC, TH

During 2011, pH of ground water during pre-monsoon ranges from 6.5 to 7.9 and 6.49 to 7.38 during post monsoon indicating neutral to alkaline nature. EC values ranges widely from 211 to 3329 $\mu\text{S/cm}$ with mean of 682 $\mu\text{S/cm}$ during pre-monsoon and from 576 to 3973 $\mu\text{S/cm}$ with average of 1824 $\mu\text{S/cm}$ during post-monsoon. TDS values also vary widely from 484 to 6746 mg/l with mean of 1540 mg/l during pre-monsoon and from 369 to 2543 mg/l average of 1177 mg/l during post-monsoon.

During 2012, pH of ground water ranges from 7.1 to 8.17 (pre-monsoon) and 7.23 to 9.24 (post monsoon) indicating neutral to alkaline nature. EC values ranged widely from 475 to 9098 with mean of 2074 during pre-monsoon and from 400 to 9920 with average of 1993 during post-monsoon. Higher values of TDS, EC during both the seasons are recorded in the downstream and close to valley areas in some wells demonstrating the effect of leachate on groundwater. Higher EC values during pre-monsoon possibly show the effect of evaporation as well as the impact of leachate. The same is true for TH values.

Major Cations

During pre-monsoon, 2011 the concentration of cations viz Ca, Mg, Na, K range from 96.19-505.01; 2.43-97.21; 46-1725; 0.39-351.9 mg/l respectively with mean values of 162.3, 40.7, 324.3, 27.5 mg/l. During post-monsoon, 2011 they range from 52.1-408.8; 6.1-106.9; 27.6-460; 0.39-3.51 mg/l respectively with average values 174.8, 30.2, 164.2, 1.37 mg/l.

Major Anions

During 2011, the anions HCO_3^- , Cl^- , SO_4 , NO_3^- , varied from 183-1232; 63.81-30.48; 4.8-115.2; 4-200; with mean values of 525.4, 533.4, 514 & 80.1 mg/l respectively during pre-monsoon. They range from 183-500.2; 31.9-1021; 21.6 -109.92; 6.2-127.1 mg/l with average values of 365.62; 358.9; 63.16; 48.12 mg/l during post-monsoon. High concentration of nitrate (>45 mg/l) is observed in 70 % of wells during pre-monsoon and 50 % of wells during post-monsoon.

Results (2012)

During 2012, pH of ground water ranges from 7.1-8.17 (pre-monsoon) and 7.23-9.24 (post monsoon) indicating neutral to alkaline nature. EC values ranged widely from 475 to 9098 with mean of 2074 during pre-monsoon and from 400 to 9920 average of 1993 during post-monsoon. TDS values also ranged widely from 306 to 4654 mg/l with mean of 1163 mg/l during pre-monsoon and from 223 to 5483 mg/l average of 1125 mg/l during post-monsoon.

The anions HCO_3^- , Cl^- , SO_4 , NO_3^- , varied from 85 to 476, 18 to 3120, 12- 144, 4 to 186 mg/l with mean values 237, 538, 62, 38 mg/l respectively during pre-monsoon. They range from 12 -561, 25-3205, 1-330, 7-196 mg/l with average values of 112, 486, 127, 65 mg/l during post-monsoon season. During pre-monsoon, the anion chemistry is dominated by chloride, constituting 9.58 to 89.04 % of total ions (average, 53.34%), followed bi-carbonate constituting 9.32 to 82.38 % of total ions (average, 32.45%), sulphate constituting 0.79 to 16.16 % of total ions (average, 8.60%). The data indicates that 17 samples (68 % samples) are of $\text{Cl}^- > \text{HCO}_3^- > \text{SO}_4$ type, while 8 (32 %) samples are of $\text{HCO}_3^- > \text{Cl}^- > \text{SO}_4$ type.

Cation chemistry

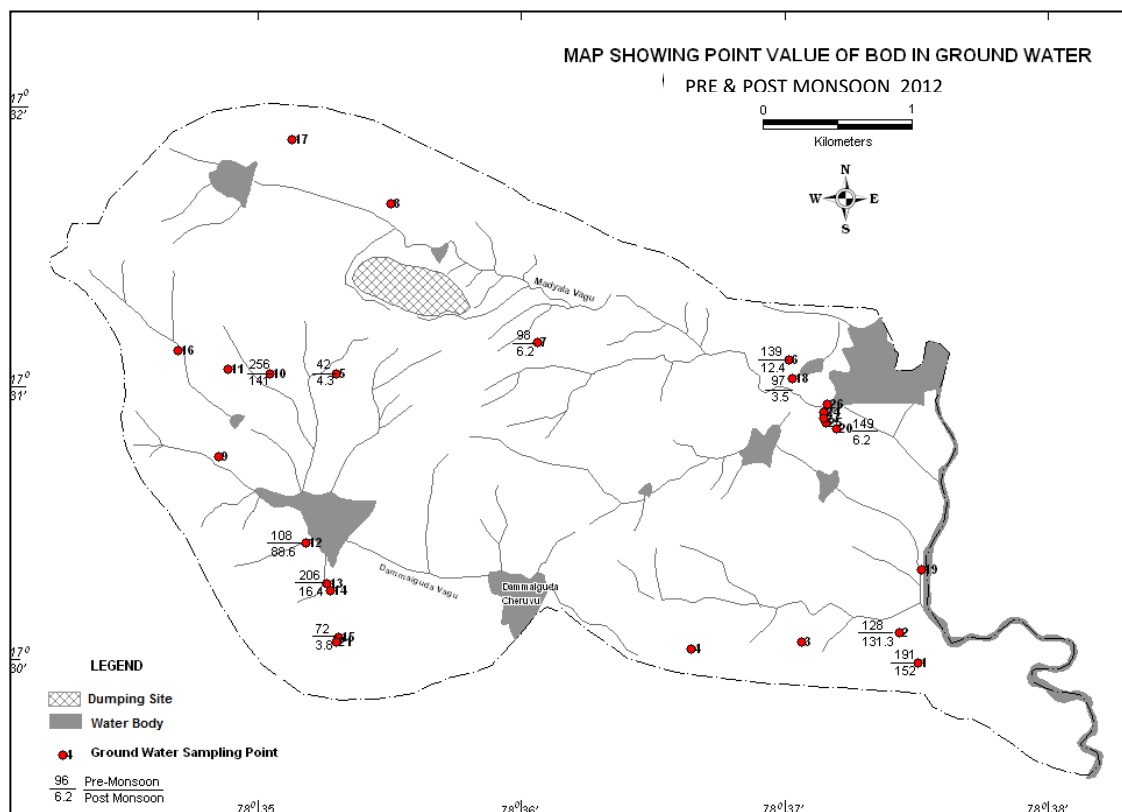
During pre-monsoon 2012, the concentrations of cations viz Ca, Mg, Na, K range from 30 to 441, 9 to 729, 28 to 405, 1 to 9 mg/l respectively with mean values of 133, 98, 147, 2 mg/l. During post-monsoon, 2012 they range from 14 to 1174, 15 to 270, 19 to 421, 0 to 11 mg/l respectively with average values 126, 81, 158, 2 mg/l. The high concentration for sodium around the landfill indicates impact of leachate. The other cations also depict similar patterns. The little high concentration of K⁺ is an indication of the leachate effect.

Total Organic Carbon

Total Organic Carbon (TOC) is a sum of the concentration of all organic carbon atoms covalently bonded in the organic molecules of a given sample of water. Total Organic Carbon does not identify specific organic contaminants. However, it detects the presence of all carbon-bearing molecules, thus identifying the presence of any organic contaminants. Worldwide reports indicate higher content of organic contaminants in groundwater near the landfills.

In unpolluted water, the TOC should be practically absent. The data shows that during pre-monsoon in all the three tanks TOC values are high (Dammai tank 48.75, Irlagutta tank, 380 and Cherial tank, 395 mg/l). In ground water (12 samples) samples also, TOC values are observed in significant amounts upto 345 mg/l (average, 153 (pre) & 55 (post) mg/l) indicating the presence of organic contamination (Table-4.3). The concentrations got diluted significantly during post-monsoon in both surface water and ground water to the extent of 90 %. However in two locations, one in surface water (Dammai tank, 48 to 108 mg/l) and in ground water sample (Maisamma temple, Ahmedguda, 128 to 131.3 mg/l) the concentrations increased.

Fig.4.2



4.2 Spatial Distribution of chemical constituents

Spatial distribution maps for TDS, Chloride, total hardness and nitrate are generated in GIS environment based on the data collected during 2012. Spatial distribution of TDS (Fig.4.4 & 4.4A) reveals that TDS concentrations is high (>2000 mg/l) around dumping site, north of Dammaiguda tank and around cherial tank. It is 500-2000 mg/l in the remaining lower reaches, while in upper reaches low TDS concentrations (<500 mg/l) are observed.

Fig.4.4

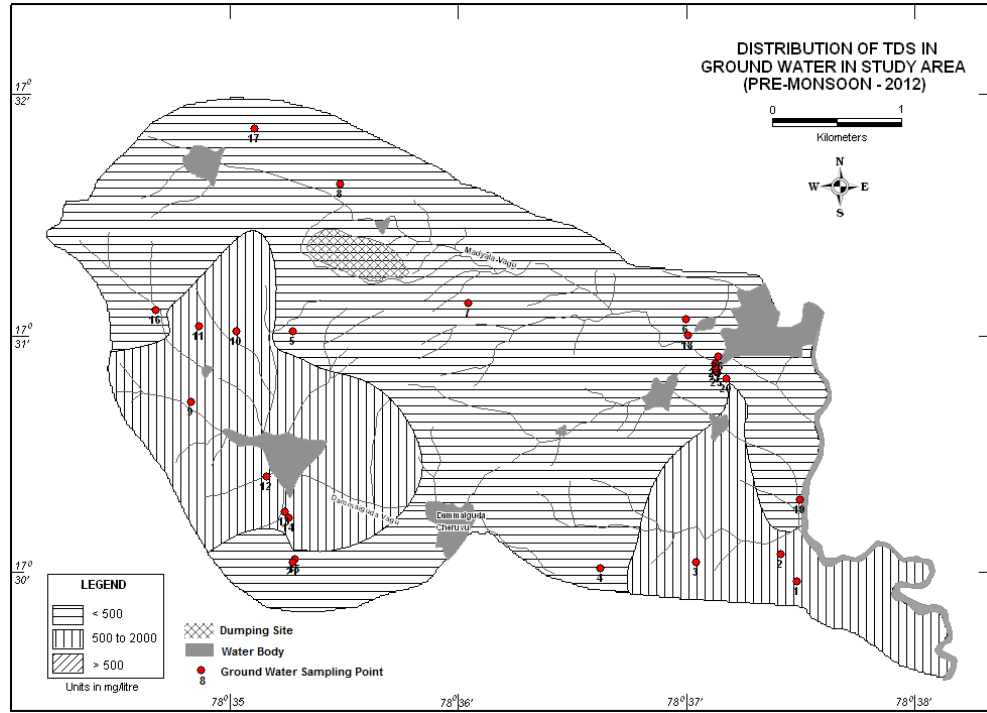
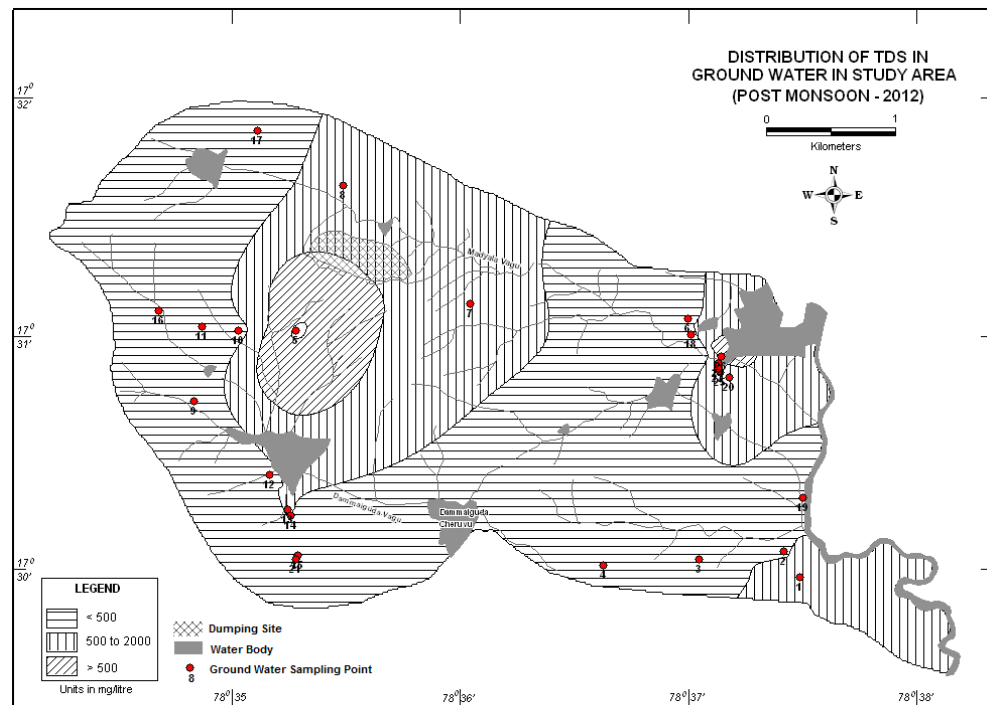
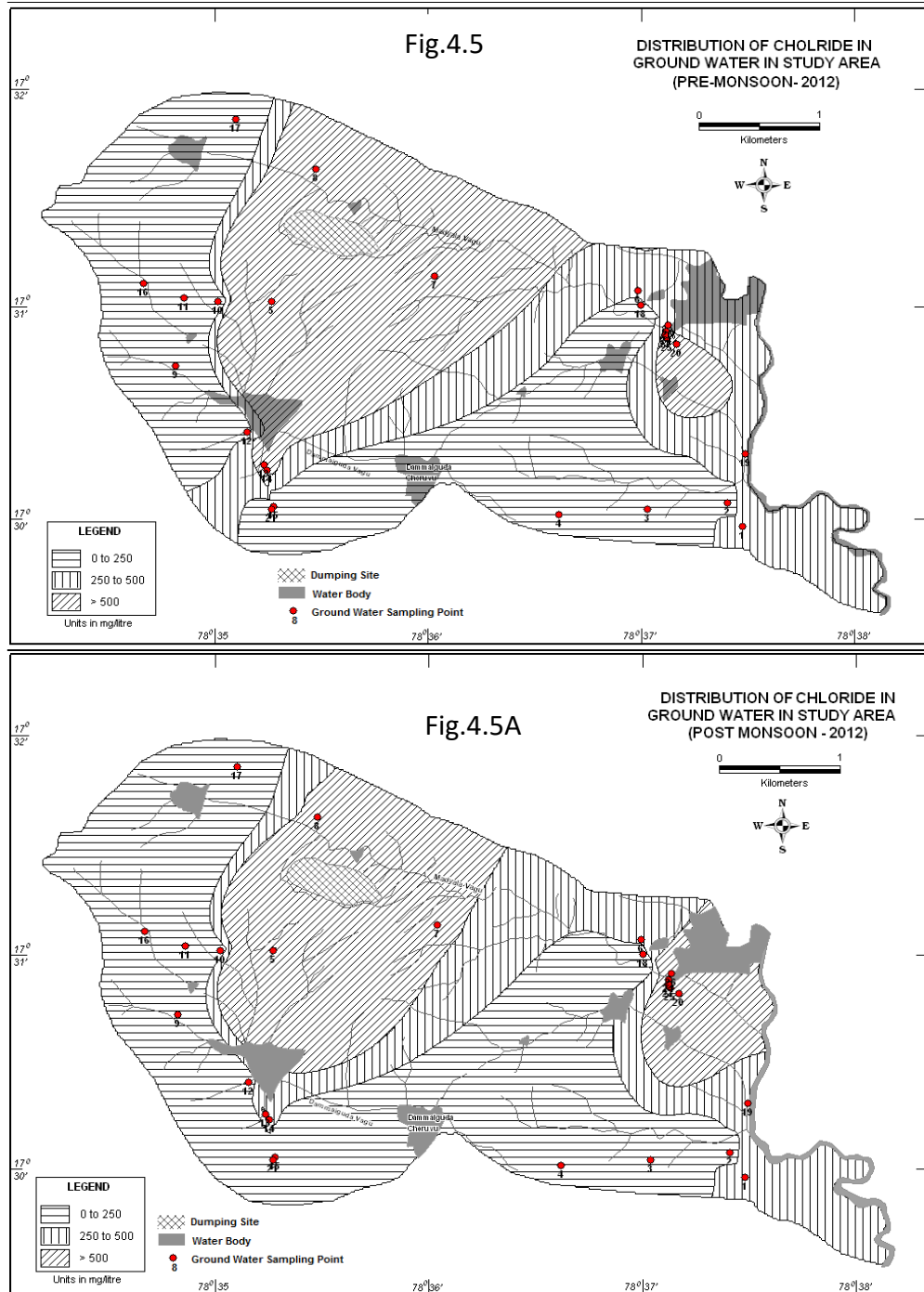


Fig.4.4A



Spatial distribution of Chloride (Fig.4.5 & 4.5A) shows the similar trend of TDS. Fig.4.6 & 4.6A depicts distribution of total hardness, which shows high values (> 600 mg/l) in areas where TDS and chloride values are high. During post-monsoon season, same trend is observed. Nitrate map (Fig.4.7 & 4.7A) depict quite contrasting and different trend from other constituents. In northern part i.e Madiyal Vagu catchment, Nitrate concentration is less (within <45 mg/l), whereas in southern part i.e, Dammaigudem catchment, nitrate is more (>45 mg/l) during pre and post-monsoon. This could be probably due to the dumping of waste containing nitrogenous compounds in southern part of dumping site, from where the leaching is more towards southern part.



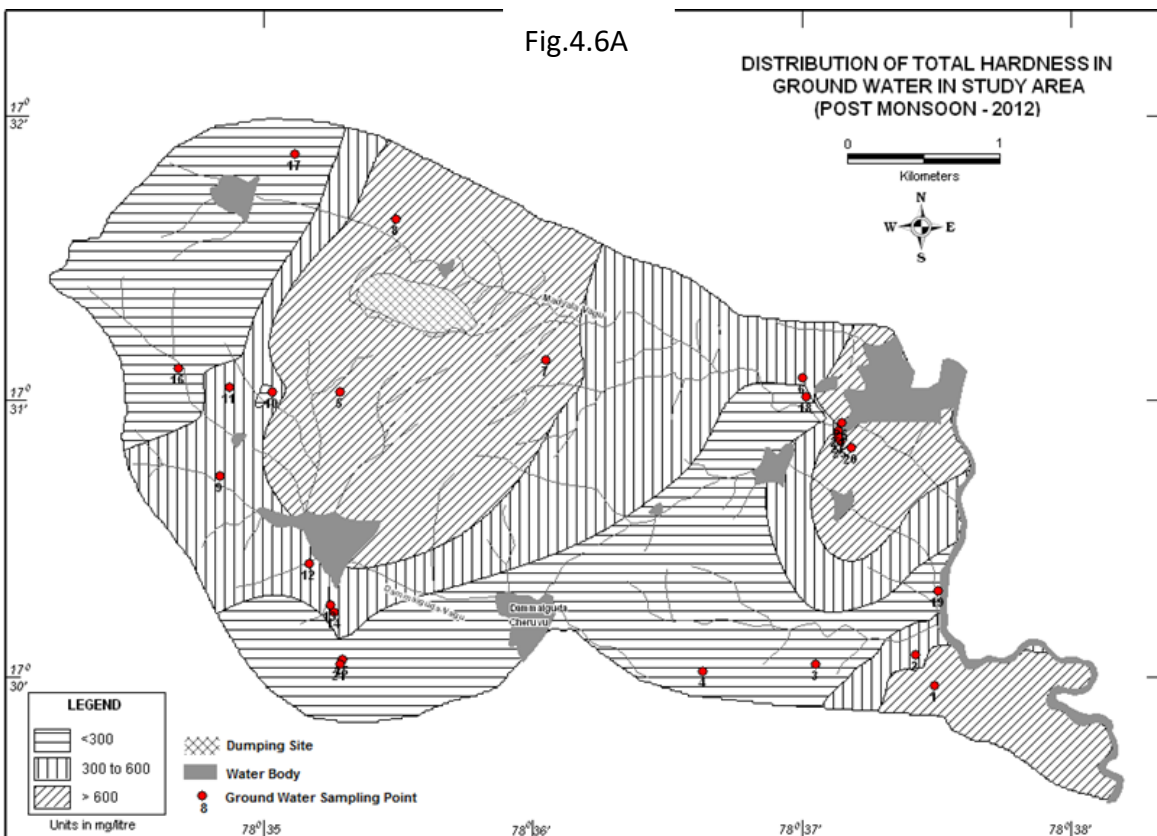
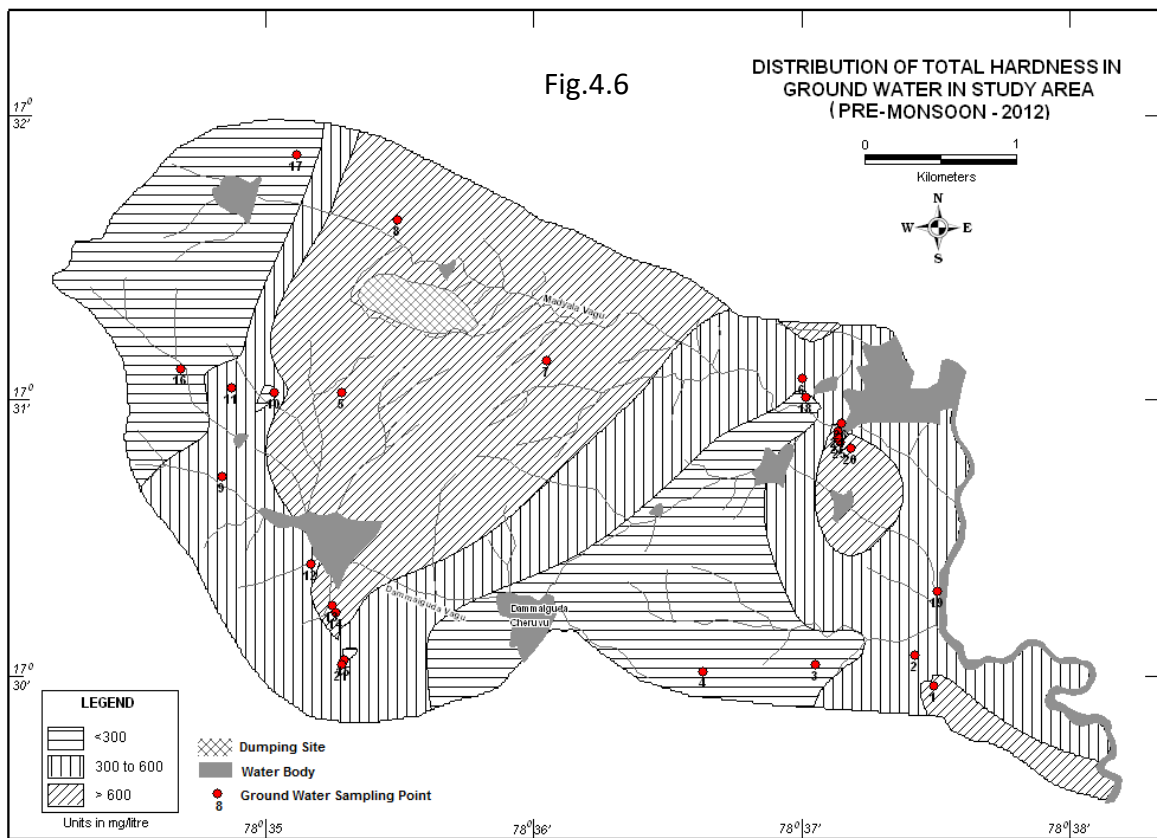


Fig.4.7

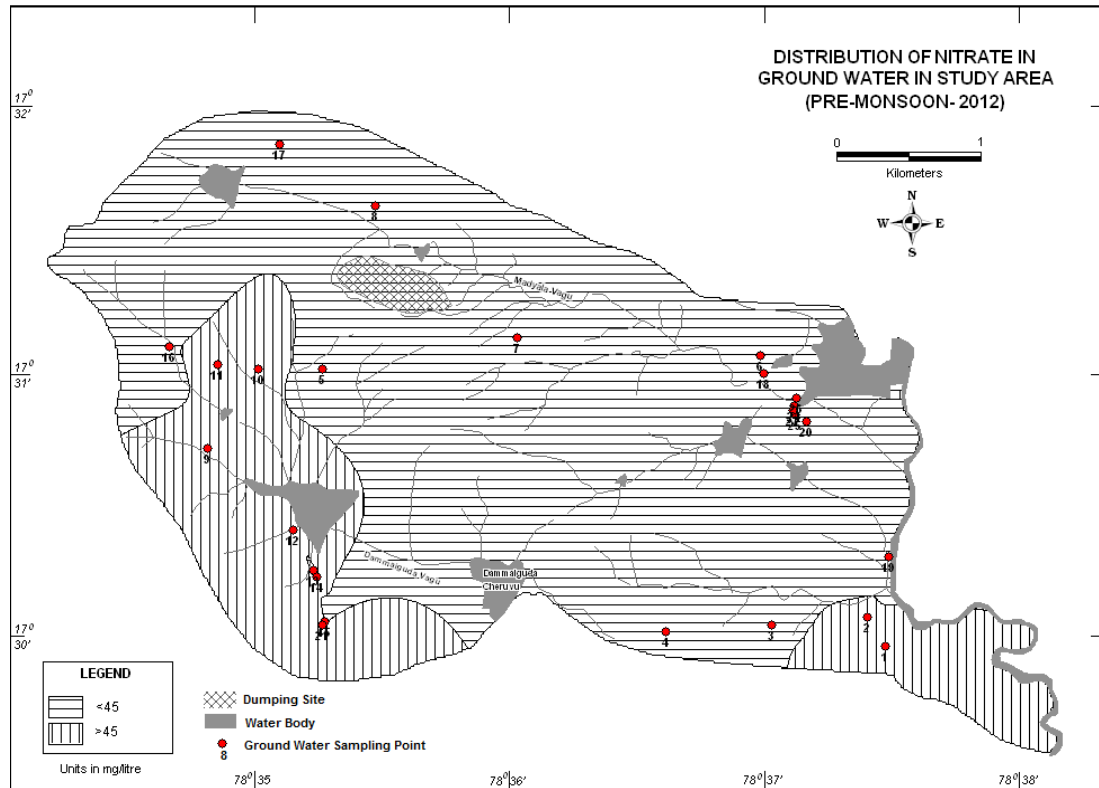
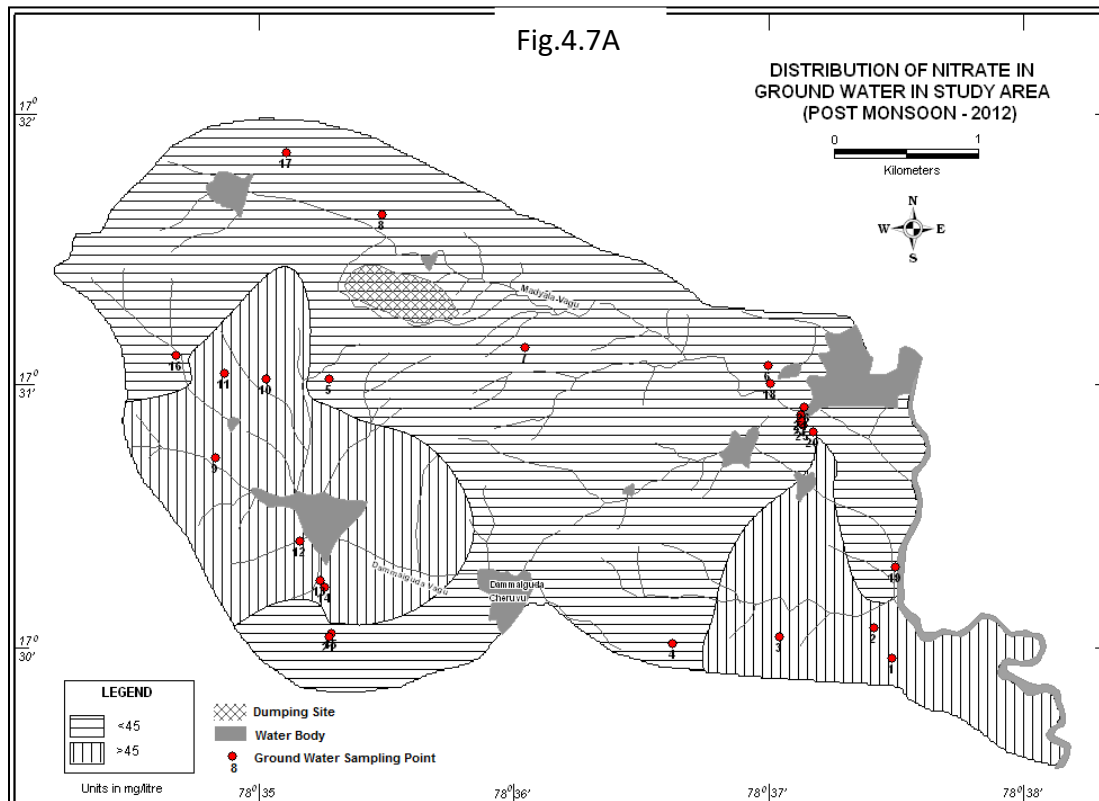


Fig.4.7A



4.3 Physico-chemical characteristics of Surface Water

The statistical parameters of chemical constituents during pre and post-monsoon, 2011& 2012 are given in the Table-4.2-B1,4.2-B2. It reveals that the surface water from the tanks (2011) are highly contaminated. EC varies from 2970-17640 with average of 9981 during pre-monsoon, 2011. Ca, Mg, Na, K ranges from 56-257, 68 -316, 437-2128, 196-215 mg/l respectively. Similarly, HCO₃, Cl, SO₄, NO₃ ranges from 470-5368, 815-1999, 5-1440, 50- 2000 mg/l respectively. The concentration of all constituents including TDS, EC, are decreased during post-monsoon. However, EC has increased in Irlagutta tank. Rain water infiltrating through dumping site, directly leaching into the Irlagutta tank, located below the hill, is elevating concentrations of EC (premonsoon;17640) and all other ions. Thus contaminated water flows downwards with attenuation in its contamination levels, as seen from reduced concentrations at Hardaspalli (12220), Peda cherial (7094). Dammalaguda cheruvu located south of dumping site is also affected (EC-2970) and all the ions are heavily loaded. EC value of 1762 & 1220 is observed in stream water collected near Kundanpalli during pre-monsoon and post- monsoon. EC values of tank water from Irlagutta and Cherial are very high during pre-monsoon, 2012, (90,560 at Irlagutta, 11390 at Cherial tank). Very high values (pre-monsoon) of total hardness (800), sodium (1495), Chloride (2907), sulphate (1008), nitrate (229) and turbidity (40) in Cherial tank water indicating the high pollution load. During post-monsoon season, dilution of all (EC upto 90 %) constituents is observed. Cl is the dominant anion, while, Na is the dominant cation in all the tank water.

5.0 HYDRCHEMICAL CHARACTERISTICS

5.1 Ion Dominance

The cation chemistry indicates that during pre-monsoon (2011), calcium is the dominant ion, constituting 12.18 to 62.75 % with average of 34.51%, closely followed by sodium constituting 12.48 to 68.22 (average, 32.82 %) of total ions followed by magnesium (16.07 to 65.58, average 32.82 %). During post-monsoon, sodium constituting 20.18 to 72.34 % (average, 36.82 %), closely followed by magnesium constituting 21 to 54.53 % (average, 35.34 %), calcium constituting 7.27 - 59.10 % with average of 27.50 %, In all, during pre-monsoon, 11 (44 %) samples are Ca>Mg>Na>K type, while 9 samples are of Mg>Na>Ca>K type, and 5 samples belong to Na> Mg>Ca type. During post-monsoon, 11 samples are of Mg>Na>Ca>K type, 9 samples (36 %) belong to Na> Mg>Ca, 5 samples (20 %) are Ca>Mg>Na or Ca>Mg>Na type.

During 2011, the anion chemistry is dominated by chloride, constituting 15.80 to 91.25 % of total ions (average, 51.79%), followed bi-carbonate constituting 3.47 to 72.86 % of total ions (average, 15.22%), sulphate constituting 0.17 to 32.15 % of total ions (average, 16.58%). The data indicates that 18 samples (72 % samples) are of $\text{Cl}^- > \text{HCO}_3^- > \text{SO}_4$ type, while 4 (16 %) samples are of $\text{HCO}_3^- > \text{Cl}^- > \text{SO}_4$ type, 1 sample is of $\text{SO}_4 > \text{HCO}_3^- > \text{Cl}^-$.

During post-monsoon 2012, the anion chemistry is dominated by chloride, constituting 15.80 to 91.25 % of total ions (average, 51.79%), followed bi-carbonate constituting 3.47 to 72.86 % of total ions (average, 15.22%), sulphate constituting 0.17 to 32.15 % of total ions (average, 16.58%). The data indicates that 18 samples (72 % samples) are of $\text{Cl}^- > \text{HCO}_3^- > \text{SO}_4$ type, while 4 (16 %) samples are of $\text{HCO}_3^- > \text{Cl}^- > \text{SO}_4$ type, 1 sample is of $\text{SO}_4 > \text{HCO}_3^- > \text{Cl}^-$. The cation chemistry shows that during pre-monsoon, calcium is the dominant ion, constituting 12.18 to 62.75 % with average of 34.51 %, closely followed by sodium constituting 12.48 to 68.22 (average, 32.82 %), of total ions followed by magnesium (16.07 to 65.58, average 32.82 %). During post-monsoon, sodium constituting 20.18 to 72.34 % (average, 36.82 %), closely followed by magnesium constituting 21 to 54.53 % (average, 35.34 %), calcium constituting 7.27 - 59.10 % with average of 27.50 %, In all, during pre-monsoon, 11 (44 %) samples are Ca>Mg>Na>K type, while 9 samples are of Mg>Na>Ca>K type, and 5 samples belong to Na> Mg>Ca type. In all, during post-monsoon, 11 samples are of Mg>Na>Ca>K type, 9 samples belong to Na> Mg>Ca, 5 samples are Ca>Mg>Na or Ca>Mg>Na type.

In tanks, during 2011 pre-monsoon, in all the four tanks, Na^+ is the dominant anion contributing >50 % to total anions. The order of abundance of cations is Na>K>Mg in 3 samples and Na>Mg>K in one sample. The order of abundance of anions is $\text{Cl}^- > \text{HCO}_3^- > \text{NO}_3^-$ in 3 samples and $\text{HCO}_3^- > \text{Cl}^- > \text{SO}_4 > \text{NO}_3^-$ in one sample. The chloride contribution to total anions range from 24 to 50 %. During post monsoon the anion abundance remains unchanged (Na>K>Mg) in 2 samples with Na contribution of 49 and 56 %. There is slight change in anion abundance, with $\text{Cl}^- > \text{HCO}_3^- > \text{SO}_4 > \text{NO}_3^-$ and $\text{Cl}^- > \text{SO}_4 > \text{HCO}_3^-$. The ion dominance of surface and ground waters is shown in Table-5.1.

Table-5.1.

Source	Ion dominance in Waters around Jawahar waste disposal site			
	Cations		Anions	
	Pre-monsoon	Post-monsoon	Pre-monsoon	Post-monsoon
Ground water (2012)	Ca > Na > Mg & Ca > Mg > Na (44 % of samples)	Ca > Na > Mg & Ca > Mg > Na (20 %)	Cl > HCO ₃ > SO ₄ (68 %) HCO ₃ > Cl (32 %)	Cl > SO ₄ > HCO ₃ (72 %) HCO ₃ > Cl > SO ₄ (16 %) SO ₄ > Cl > HCO ₃ (4 %) NO ₃ > Cl > SO ₄ (4 %)
	Mg > Na > Ca &	Mg > Na > Ca &		
	Mg > Ca > Na (36 %)	Mg > Ca > Na (44 %)		
	Na > Ca > Mg &	Na > Mg > Ca &		
	Na > Ca > Mg (20 %)	Na > Ca > Mg (36 %)		
Surface water (2012 & 2011)	Na > K > Mg	Na > K > Mg > Ca	Cl > HCO ₃ > NO ₃	Cl > HCO ₃ > SO ₄

5.2 Hydrochemical facies

Modified Piper Diagram

Chadha diagram (Fig.5.1A & 5.1B) depicting geochemical facies of ground water has been generated using chemical analysis data during pre and post monsoon (2012).

Fig.5.1A

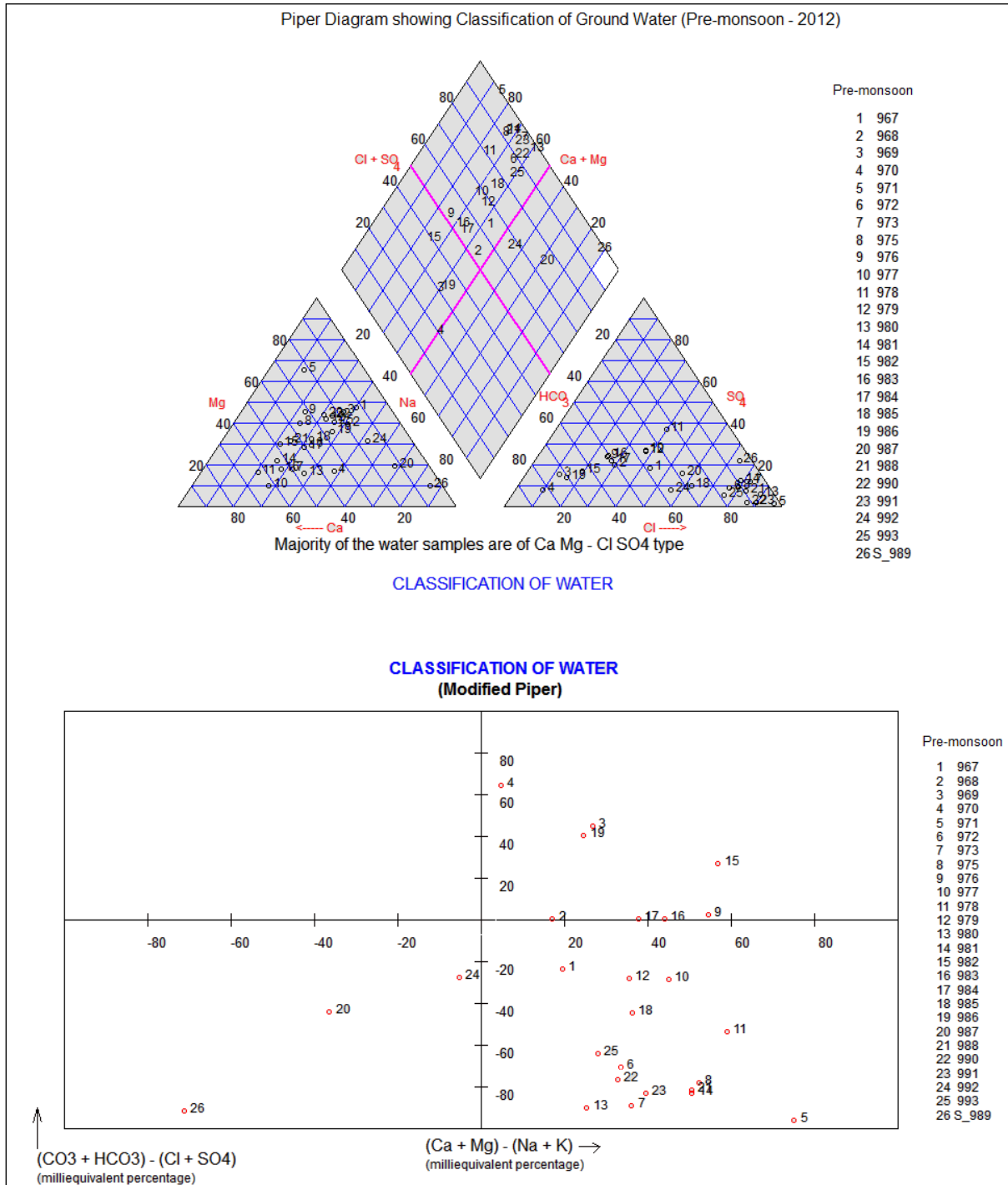
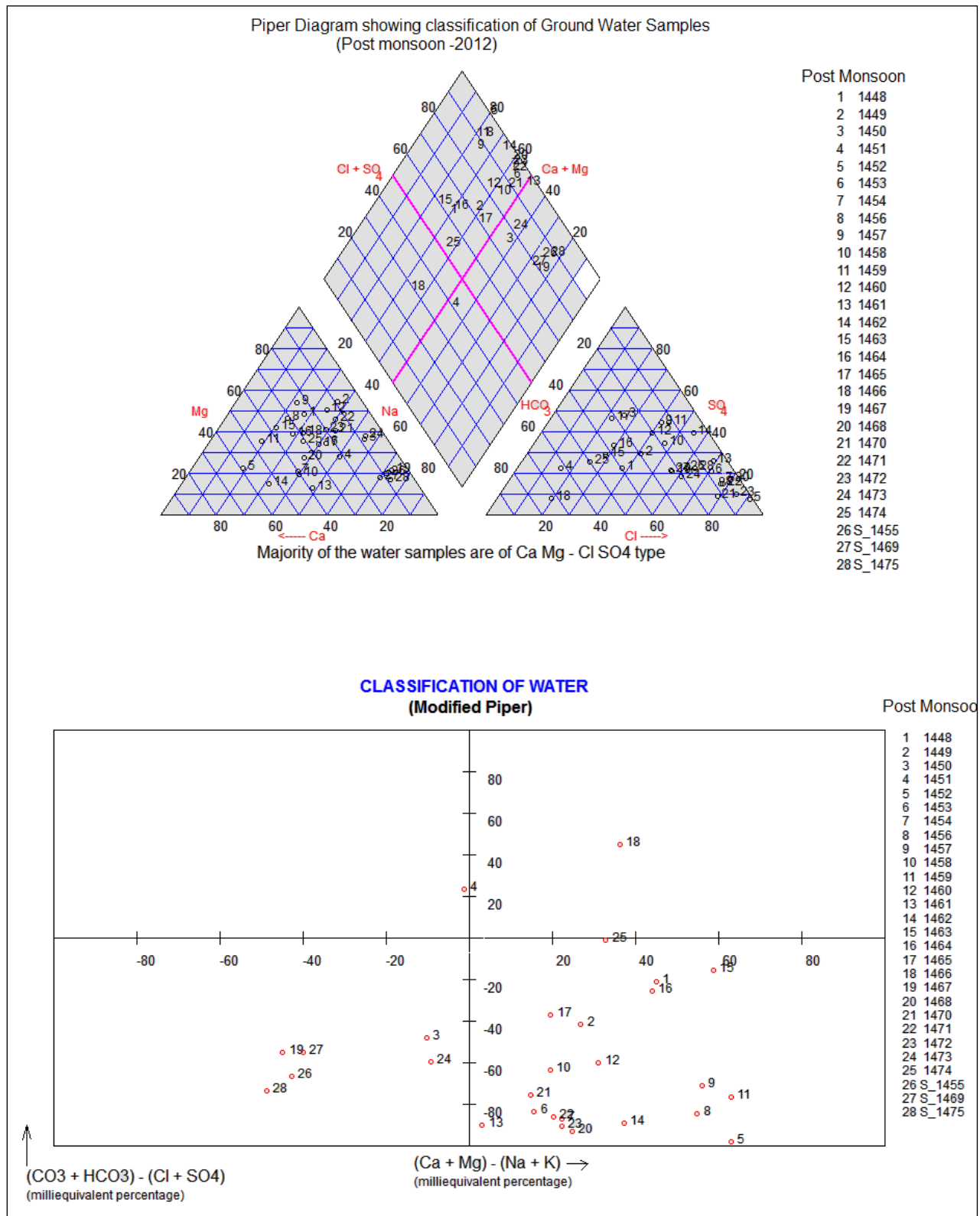


Fig.5.1B



During pre-monsoon, 13 samples (52%) and 17 samples (68%) during post monsoon comes under the subfield 6; such waters are Ca-Mg-Cl type with permanent hardness, while 3 samples of pre-monsoon (12 %) and 6 of post monsoon (24 %) fall under the subfield 7; they are Na-Cl type with salinity problem; 8 samples (32 %) during pre-monsoon and 1 (4 %) during post monsoon fall under subfield 5 (Ca-Mg-HCO₃ type with temporary hardness), while 1 sample (4 %) during post monsoon fall under sub field 8 (Na-HCO₃ type) causing foaming effect in domestic use. Facies-wise distribution of ground water is furnished in the Table-5.2.

Table-5.2
Hydrochemical facies – Sample wise Distribution

Based on Piper Diagram

Sl. No.	Facies	Pre-monsoon (Sample No.) (Total)
1.	CaHco ₃	15,3,19, (3)
2.	Nacl	24,20,26 (3)
3.	Mixed CaHco ₃	-
4.	Mixed CaMgcl	25,18,10,12,9,16,17,1,2, (9)
5.	Cacl	5,11,21,22,23,6,8,14,13, (9)
6.	NaHco ₃	-

Pre-monsoon

Based on Modified Piper Diagram

Sl. No.	Facies	Pre-monsoon (Sample No.) (Total)
1.	CaHco ₃	2,7,16, (3)
2.	Nacl	-
3.	Mixed CaHco ₃	-
4.	Mixed CaMgcl	-
5.	Cacl	4,3,19,15, (4)
6.	NaHco ₃	1,12,10,18,11,25,6,22,23,8,44,7,13,5, (14)
7.		20,24,26, (3)
8.		-

Based on Piper Diagram

Sl. No.	Facies	Post-monsoon (Sample No.) (Total)
1.	CaHco ₃	18 (1)
2.	Nacl	2,13,19,8,24,3,26, (7)
3.	Mixed CaHco ₃	4 (1)
4.	Mixed CaMgcl	2,15,16,17,25,10,12,21, (9)
5.	Cacl	6,23,1,18,9,14,22,29 (8)
6.	NaHco ₃	-

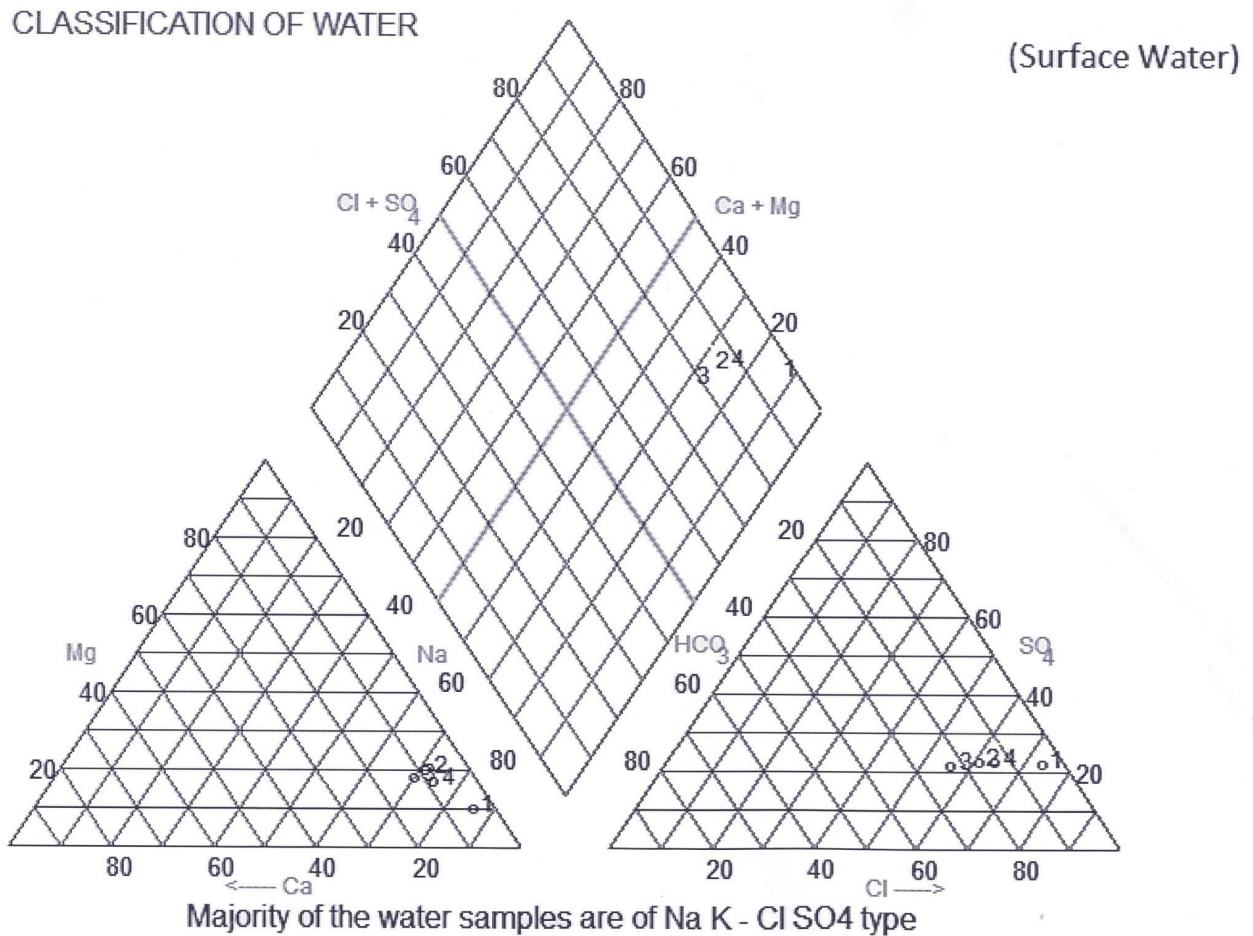
Post-monsoon

Based on Modified Piper diagram

Sl. No.	Facies	Post-monsoon (Sample No.) (Total)
1.	CaHco ₃	25 (1)
2.	Nacl	-
3.	Mixed CaHco ₃	-
4.	Mixed CaMgcl	-
5.	Cacl	18, (1)
6.	NaHco ₃	15,1,16,17,2,10,12,21,6,13,22,23,20,14,9,8,11,5,(18)
7.		-
8.		19,28,26,3,24 (5)

Piper (1994) Trilinear diagram is presented in the Fig.5.1A & 5.1B. Majority of samples falling in 4 and 5 sub divisions during pre and post monsoon, indicating Ca-Mg-Cl-SO₄ type, followed by Ca-Cl type. The samples in sub-division 5 have permanent hardness, 1 have temporary hardness and 1 is saline. Piper diagram pertaining to surface waters is presented in the Fig.5.2A & 5.2B. It shows that the hydrochemical facies is Na-Cl type.

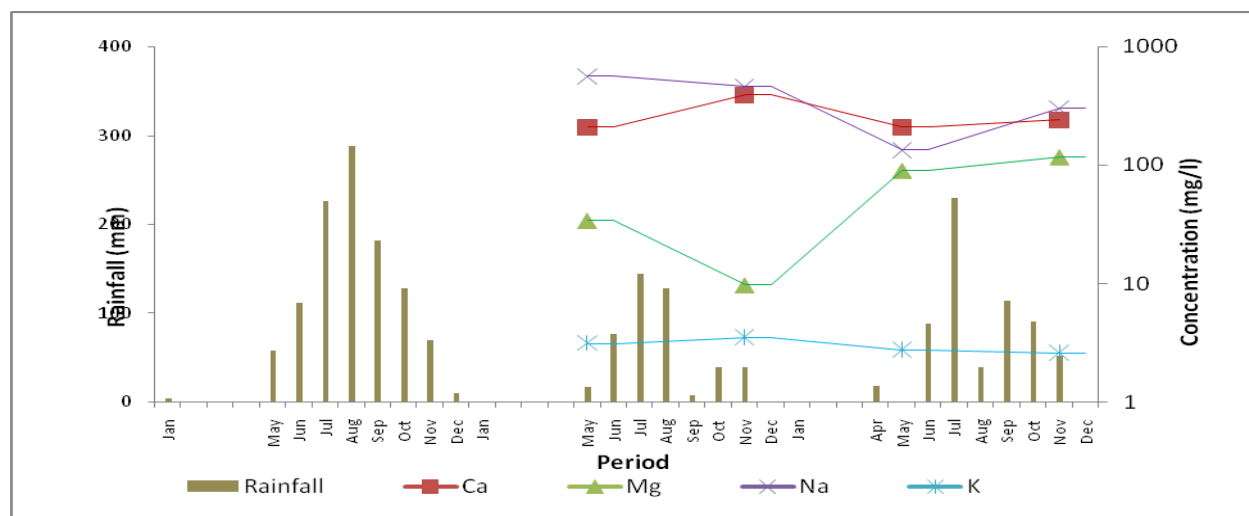
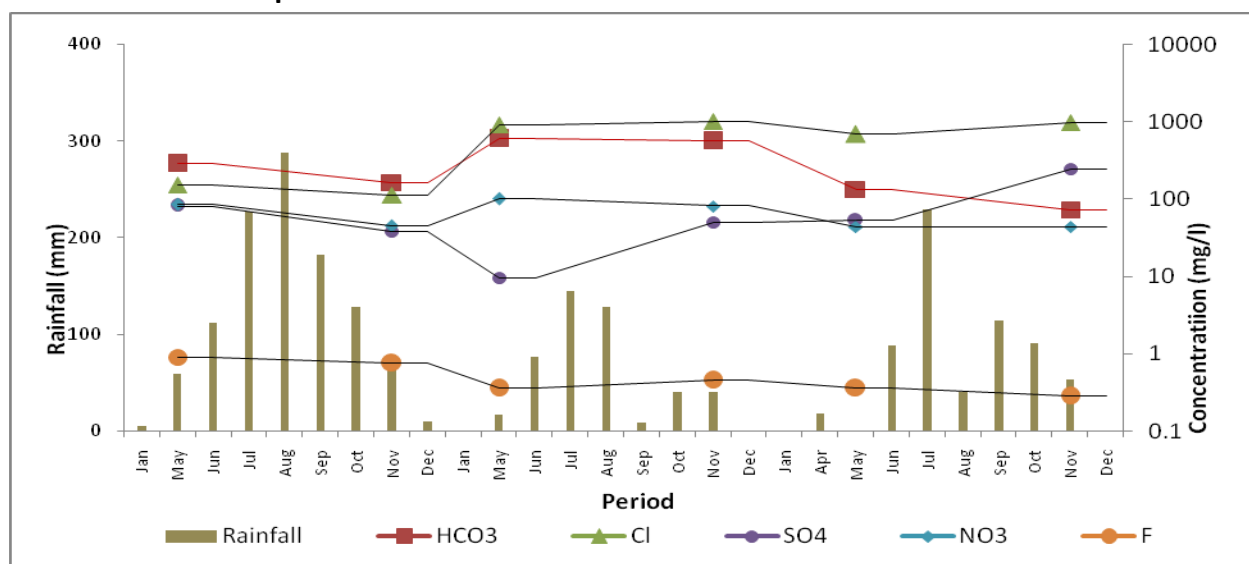
Fig.5.2
Piper Trilinear diagram - surface water



Temporal Variations

Temporal variations of cations, anions and TDS during pre and post monsoon (2010 & 2011, 2012) are shown in the Fig.5.3 to 5.8. Considerable variations; season-wise, year-wise and location-wise are observed. The increase in concentrations of pollutants is prominent at Cherial between 2010-12, as evident from chloride concentrations from 152 (pre, 2010) to 695 (pre, 2012) and 113(post 2010) to 1021 mg/l(post, 2012), TDS from 744 (pre, 2010) to 1308(pre,2012), 1182(post 2010) to 1970 (post, 2012). Similarly significant increase in concentration of chemical constituents in Cherial tank water between 2010 and 2012 are noticed as seen the increase of Na concentration from 844 to 2701, Cl from 957 to 2907, TDS from 2854 to 7269 mg/l(pre-monsoon, 2010 to premonsoon, 2012) respectively.

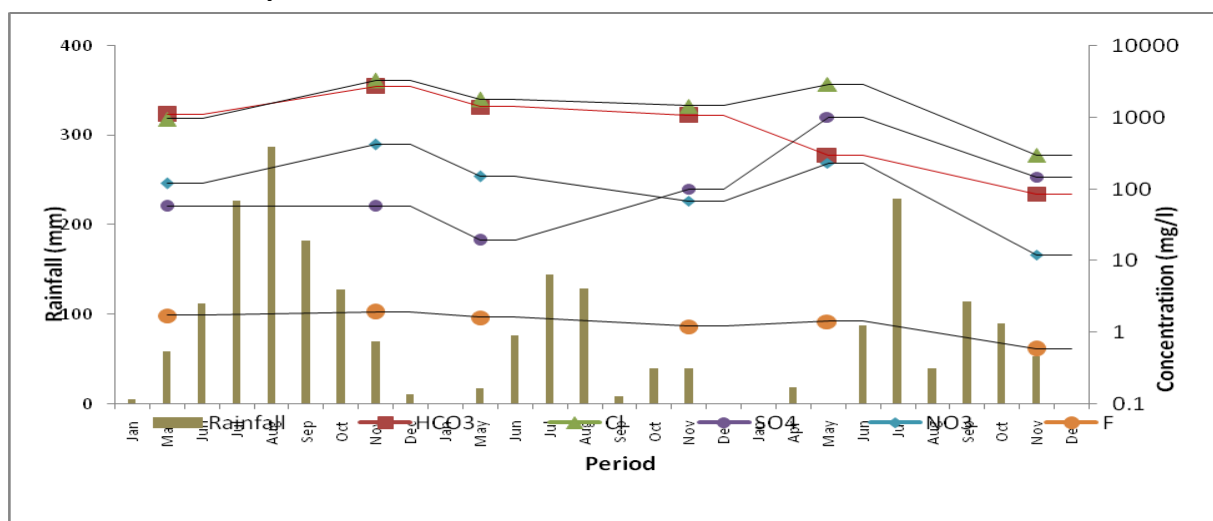
Fig.5.3
Temporal Variations of Chemical Constituents - CHERIAL VILLAGE



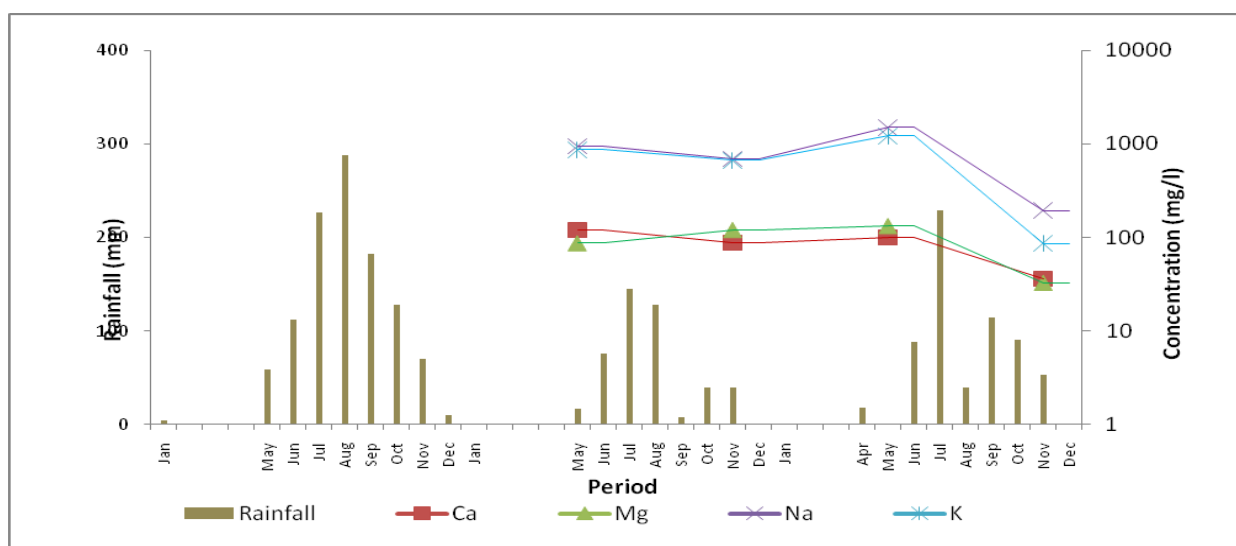
Elevated concentrations of contaminant ions Cl (922 Pre, 1021 post), NO₃ (100 pre, 81 post), Na (563, 460) are observed during the low rainfall year (2011) in Cherial village, compared to 2010 & 2012. However F concentration has decreased during 2011, compared to 2010. In E Nandamuri colony, during post monsoon, the concentrations of Cl, NO₃, SO₄ have increased during 2010 and 2012 and decreased during 2011. In Venkateswara nagar colony, all concentrations decreased (except fluoride) during post-monsoon, 2012 and during 2010 & 2012, there is no significant change in concentration. Concentration of chemical constituents have decreased during post monsoon in Cherial tank water during 2012, while during 2010 they are increased.

The variability in concentrations could be due to variations in rainfall, quantum and nature of waste and fracture pattern. Compared to 2010, there is marginal rise in pollutants like Na and Cl, though it is not uniform in all the samples and seasons.

Fig.5.4
Temporal Variations of Chemical Constituents - CHERIAL TANK

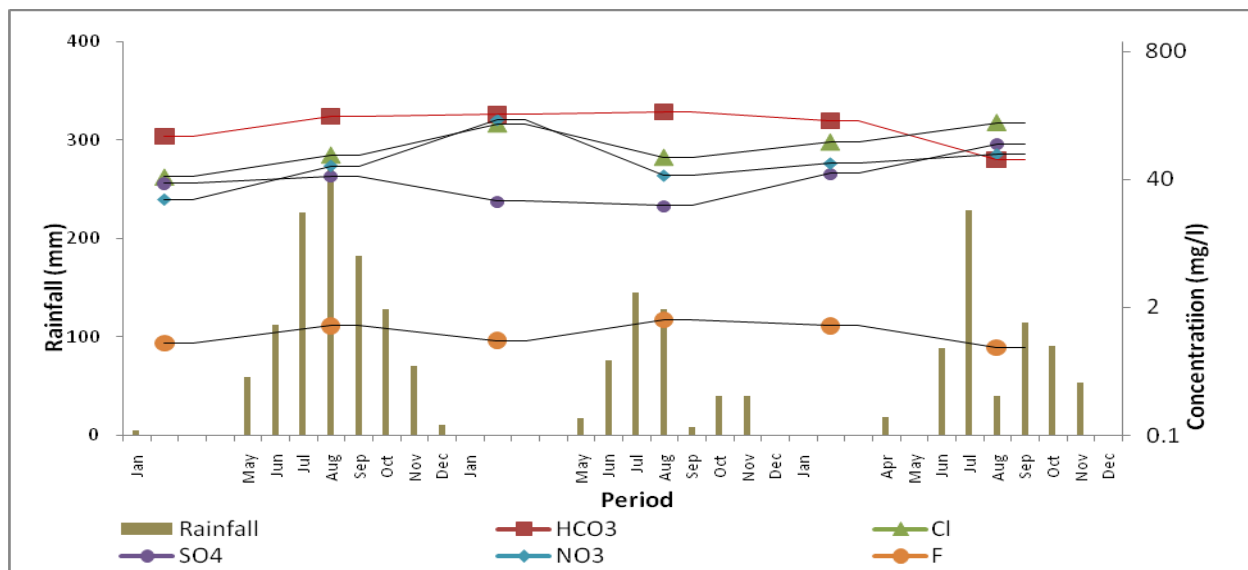


ANIONS

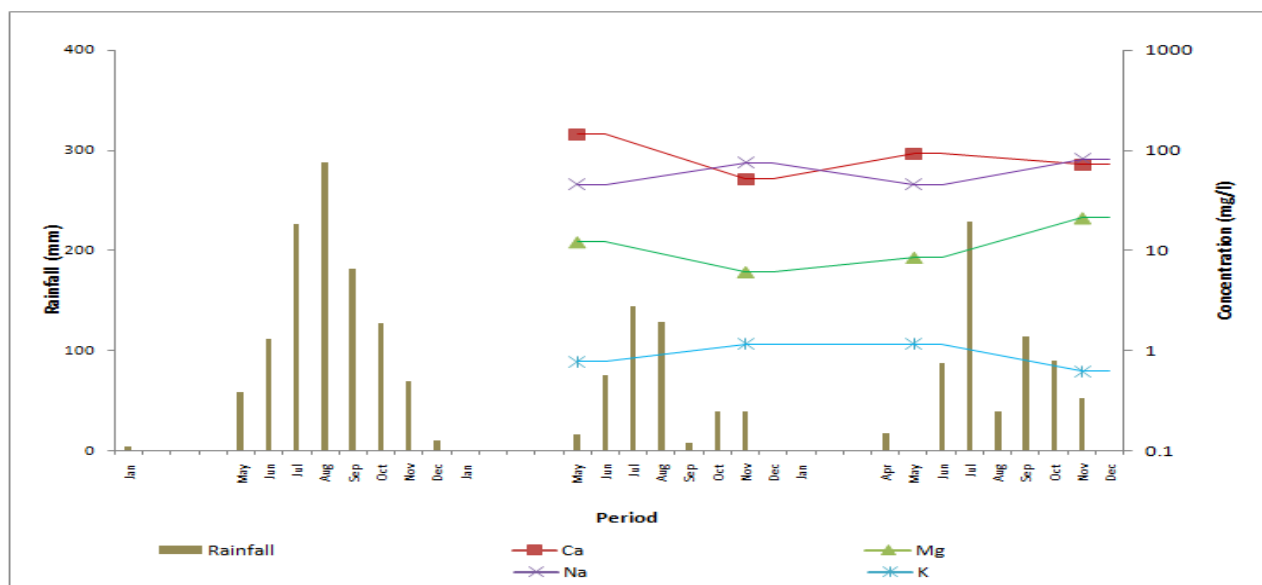


CATIONS

Fig.5.5
Temporal Variations of Chemical Constituents - E. Nandamuri Colony

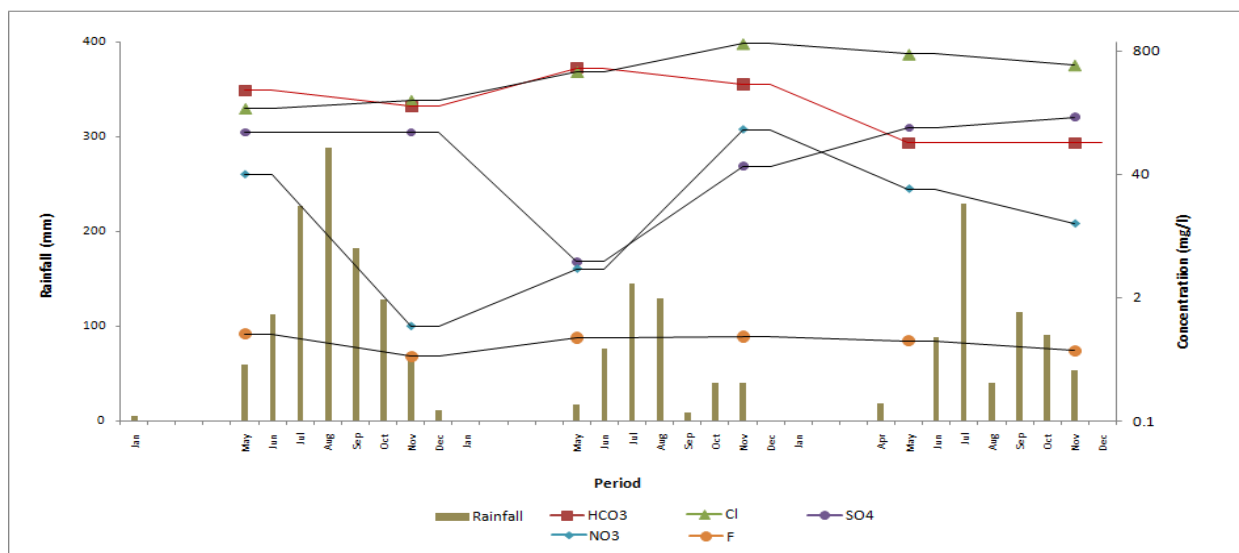


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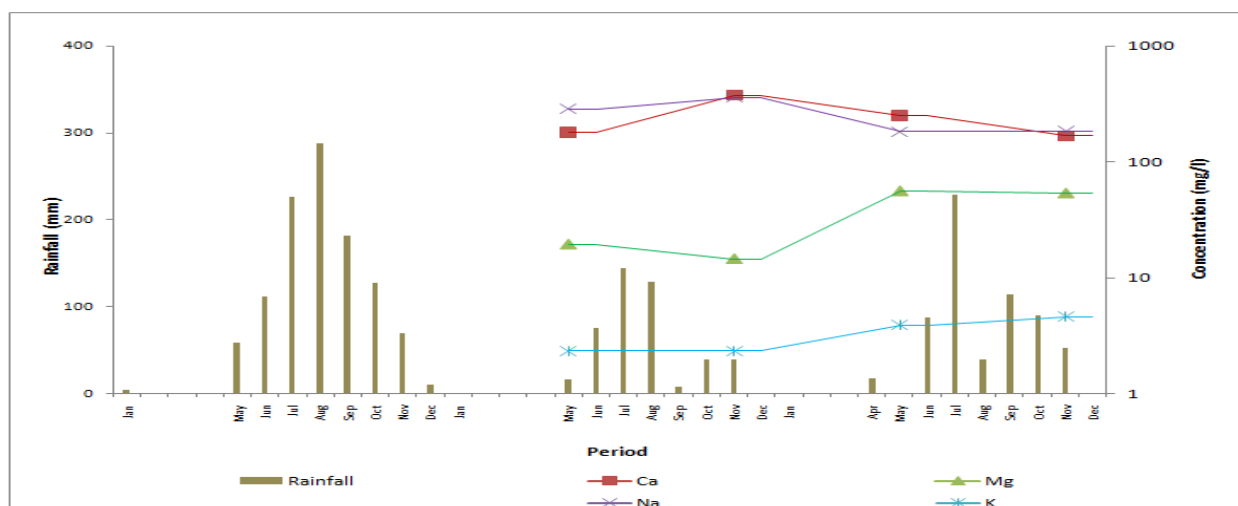


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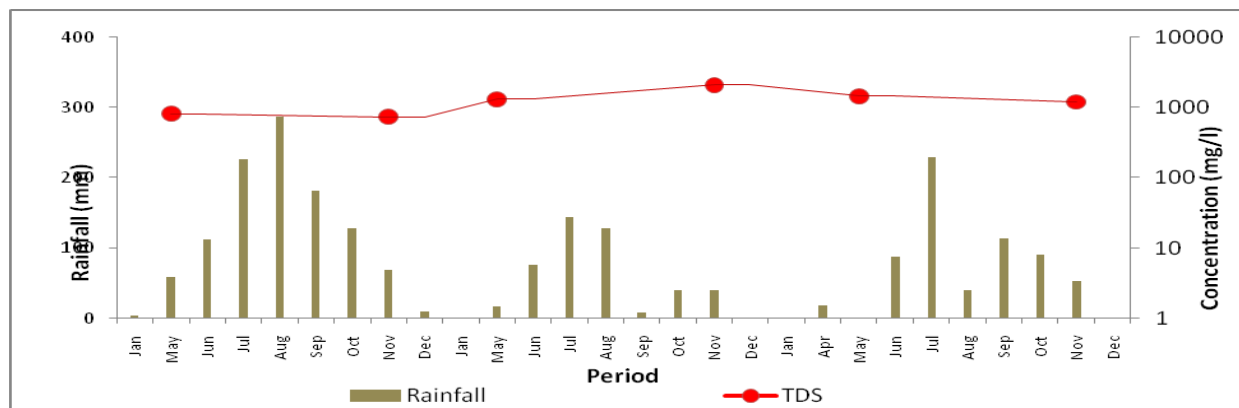
Fig.5.6
Temporal Variations of Chemical Constituents - Hardaspalli Village



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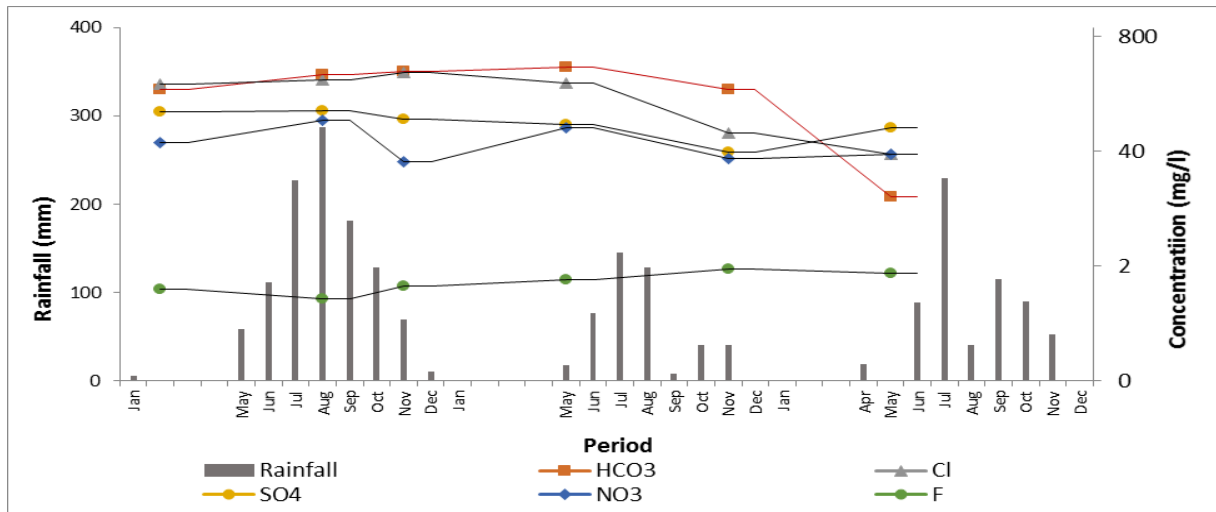


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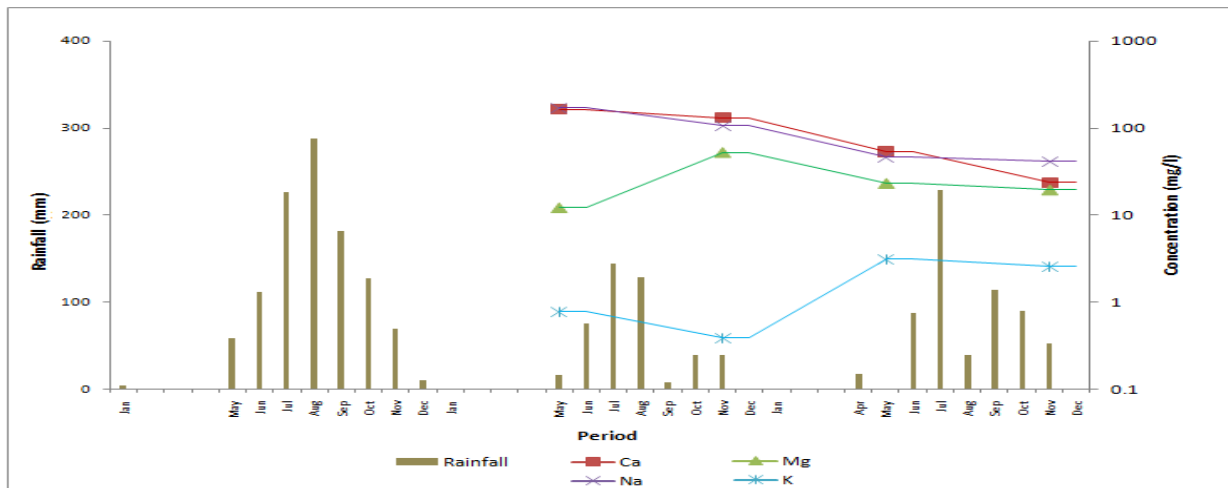


TDS

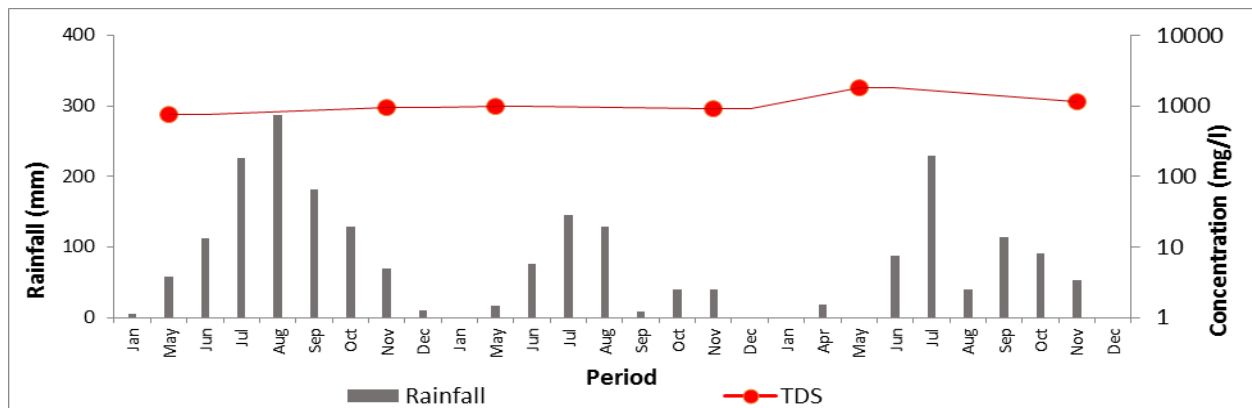
Fig.5.7
Temporal Variations of Chemical Constituents - Malkaram Cross Road



ANIONS

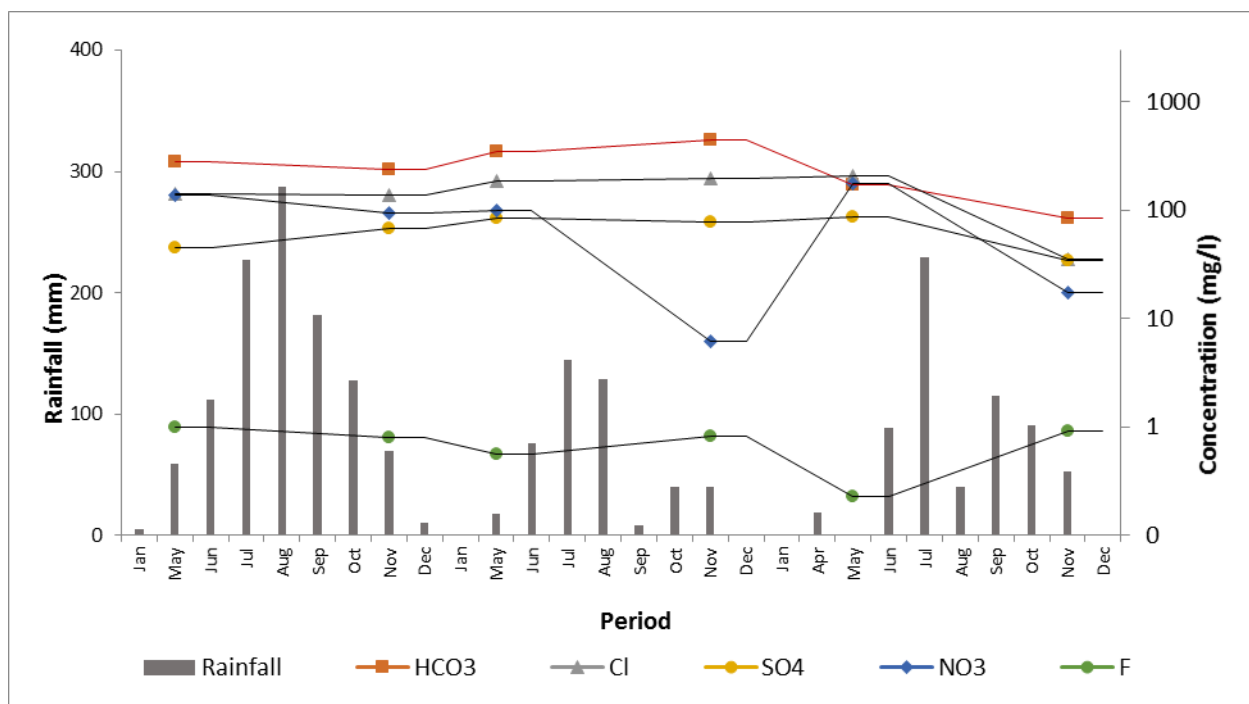


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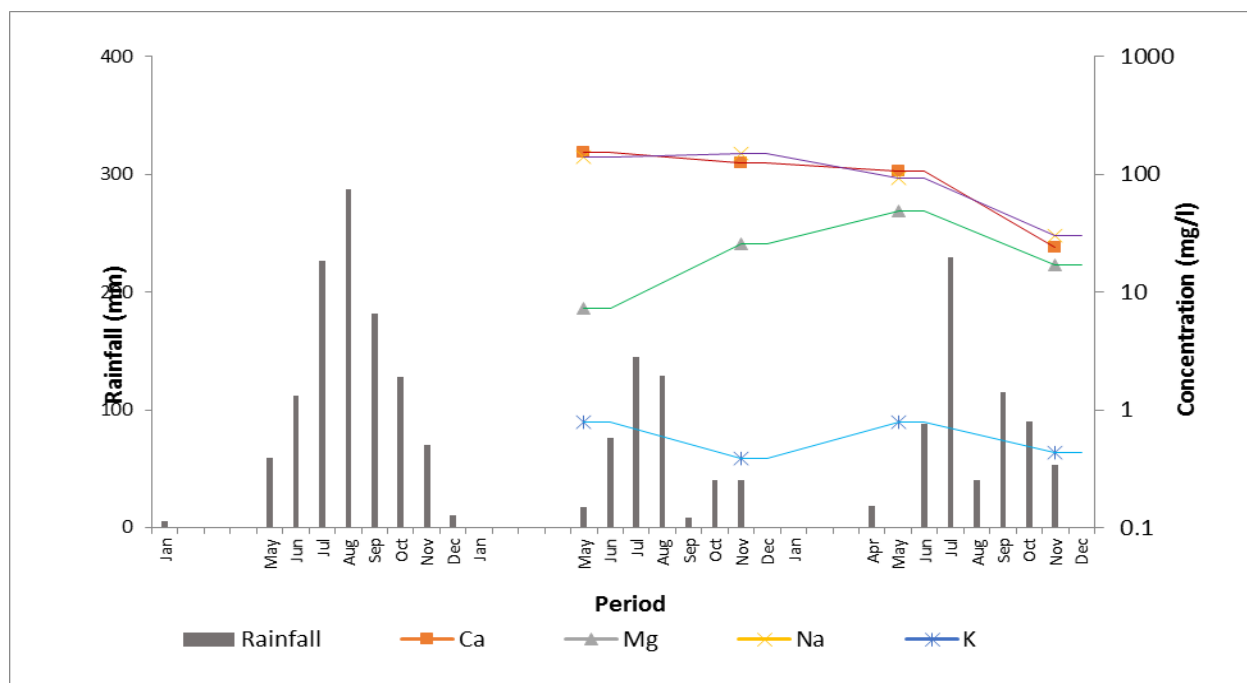


TDS

Fig.5.8
Temporal Variations of Chemical Constituents - Venkateswara Nagar Colony



ANIONS



CATIONS

Inter relationship of chemical constituents

The interrelationship among chemical parameters are evaluated through correlation coefficients to assess the source of dissolved salts in ground water (Table-5.3). A high correlation coefficient (near 1 or -1) means a good relationship between two variables and a correlation efficient around zero means no relationship. Good correlation is observed between TDS-EC, Ca-Mg, Na-Cl, Mg-Cl, Ca-Cl, etc shows all of them have same origin. EC has strong positive correlation with Ca ($r=0.848$ & 0.904), Mg ($r=0.915$ & 0.883), Na^+ ($r=0.741$ & 0.0839), Cl^- ($r=0.996$ & 0.0994), ions in pre and post monsoon respectively. It is pertinent to note that though low correlation exists between EC and sulphate ($r=0.101$), significant positive correlation is seen during post-monsoon ($r=0.854$).

Table- 5.3
Correlation coefficient of Chemical Constituents - Pre-monsoon

	EC	TH	Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	F	TDS
EC	1.000	0.978	0.848	0.915	0.741	0.161	-	-0.277	0.996	0.101	-0.160	-0.680	0.999
TH		1.000	0.812	0.962	0.587	0.122		-0.325	0.984	0.013	-0.104	-0.624	0.972
Ca			1.000	0.621	0.649	0.007		-0.598	0.858	0.212	-0.043	-0.687	0.853
Mg				1.000	0.484	0.160		-0.155	0.918	-0.083	-0.119	-0.515	0.904
Na					1.000	0.264		0.044	0.704	0.417	-0.288	-0.628	0.760
K						1.000		0.364	0.122	0.257	0.047	-0.228	0.175
CO_3							-	-	-	-	-	-	-
HCO_3								1.000	-	0.127	-0.053	0.201	-0.262
Cl									1.000	0.058	-0.182	-0.671	0.992
SO_4										1.000	0.026	-0.120	0.146
NO_3											1.000	0.067	-0.145
F												1.000	-0.687
TDS													1.000

Post-monsoon season

	EC	TH	Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	F	TDS
EC	1.000	0.981	0.904	0.883	0.839	0.267	-0.311	0.112	0.994	0.854	-0.138	-0.605	0.999
TH		1.000	0.956	0.835	0.718	0.238	-0.333	0.086	0.980	0.789	-0.089	-0.534	0.981
Ca			1.000	0.637	0.565	0.110	-0.364	-	0.917	0.700	-0.055	-0.429	0.909
Mg				1.000	0.830	0.421	-0.192	0.279	0.857	0.761	-0.129	-0.600	0.874
Na					1.000	0.285	-0.183	0.158	0.820	0.856	-0.252	-0.675	0.838
K						1.000	-0.187	0.769	0.191	0.189	0.151	-0.155	0.269
CO_3							1.000	-	-0.321	-	-0.111	0.313	-
HCO_3								1.000	0.033	-	0.195	-0.064	0.114
Cl									1.000	0.841	-0.208	-0.597	0.992
SO_4										1.000	-0.084	-0.593	0.859
NO_3											1.000	0.045	-
F												1.000	-
TDS													1.000

In natural environment, a negative relationship between dissolved Ca^{2+} and Na^+ is expected. Good relationship exists between Ca^{2+} & Na^+ ($r=0.649$ & 0.637) indicates anthropogenic source. F shows positive correlation with HCO_3 only ($r=0.21$), as it is an important factor responsible for F enrichment during pre-monsoon season. However during post-monsoon negative relationship is observed. A positive correlation with Ca ($r=0.848$ & 0.904), Mg ($r=0.915$ & 0.883), Na^+ ($r=0.741$ & 0.0839), Cl^- ($r=0.996$ & 0.0994) suggests that aquifer chemistry is mainly controlled by Ca, Mg, Na^+ and Cl^- .

Chloroalkaline indices

The chemical reactions in which ion exchange between ground water and aquifer environment occur during the period of travel is understood from the study of Chloroalkaline indices.

During pre-monsoon (2011), the Chloroalkaline indices range from negative (-0.076) to positive (0.507). 45 % of samples show negative ratio (reverse exchange) indicating the Base Exchange (exchange of Na and K from rock with Ca & Mg in water) while the remaining 55 % of samples indicate positive ratios (direct exchange) suggesting exchange between Na and K in water with Ca & Mg in rocks. During post monsoon, the Chloroalkaline indices range from negative (- 0.07) to positive (-1.505), exception being 23.78. In all 50% of samples show negative ratio indicating the base exchange (exchange of Na and K from rock with Ca & Mg in water and vice versa) while the remaining 50 % of samples indicate positive ratios.

During pre-monsoon (2012), the Chloroalkaline indices range from negative (-4.106) to positive (0.80). 35% of samples show negative ratio (reverse exchange) indicating the base exchange (exchange of Na and K from rock with Ca & Mg in water) while the remaining 65% of samples indicate positive ratios (direct exchange) suggesting exchange between Na and K in water with Ca & Mg in rocks. During post monsoon (2012), the Chloroalkaline indices varies from negative (- 2.017) to positive (0.80). In all 21% of samples show negative ratio indicating the base exchange (exchange of Na and K from rock with Ca & Mg in water and vice versa) while the remaining 79 % of samples indicate positive ratios.

In Tank waters, during pre-monsoon season (2011), the Chloroalkaline indices of four tank waters show negative (-0.044 to 1.684) (0.80) values, indicating the base exchange (exchange of Na and K from rock with Ca & Mg in water). During post monsoon out of 2 samples monitored, one sample indicate positive ratio of 0.35 (direct exchange) suggesting exchange between Na and K in water with Ca & Mg in rocks, while one sample show negative ratio of -0.354 base exchange (exchange of Na and K from rock with Ca & Mg in water).

Gibbs Diagram

Gibbs ratio of $Cl/(Cl+HCO_3)$ and $Na+K/(Na+K+Ca)$ suggest that considerable samples fall in rock dominance while other samples tend towards evaporation field

5.3 SUITABILITY OF WATER FOR DIFFERENT PURPOSES

Drinking purpose

During 2012, according to BIS, 2012, 73 - 77 % of samples have TDS values exceeding the safe limit of drinking water standards (500 mg/L) while 15 and 19 % of samples exceed permissible limit (2000 mg/l) during pre and post-monsoon respectively (Table-5.4). Hardness is very important property of water from its domestic application point of view. Based on the chemical data 27 and 36 % of samples, have total hardness within desirable limit for drinking water while 38 and 32% of samples are beyond permissible limit (600 mg/l) in the absence of alternate source during pre and post-monsoon respectively. As per hardness classification of Sawyer & McCarty (1967) 4 and 2 % of samples are moderate soft (75-150 mg/l), 24 and 32 %_samples are hard (150-300 mg/L) and 72 and 60 % of samples are very hard (>300 mg/L) during pre and post-monsoon respectively (Table-5.4).

Table-5.4
Percentage of samples exceeding BIS standards - Drinking Purpose

B.I.S.Standards	2011		2011	
	Pre-Monsoon		Post-Monsoon	
TDS	GW (%)	TANK	GW	TANK
< 500	4(27)	0	4(23)	0
500 - 2000	8(53)	1(25)	8(47)	0
> 2000	3(20)	3(75)	5(30)	2
TH				
< 75	0	0	0	0
75 - 150	0	0	0	0
> 150	15(100)	4(100)	16(100)	4(100)
TH				
< 300	3(20)	0	0	0
300 - 600	7(46)	1(25)	5(31)	0
> 600	5(34)	3(75)	11(69)	2(100)
Cl				
< 250	8(54)	0	9(56)	0
250 - 1000	5(34)	1(25)	5(31)	0
> 1000	2(12)	3(75)	2(13)	2(100)
No ₃				
< 45	5(34)	0	9(56)	0
> 45	10(66)	4(100)	7(44)	2(100)
Ca				
< 75	0	2(50)	3(19)	0
> 75	15(100)	2(50)	13(81)	2(100)
Na				
< 200	9(60)	0	12(75)	0
> 200	6(40)	4(100)	4(25)	2(100)

B.I.S.Standards	2012		2012	
	Pre-Monsoon		Post-Monsoon	
TDS	GW	TANK	GW	TANK
< 500	7(27)	0	6(23)	0
500 - 2000	15(58)	0	15(58)	1(50)
> 2000	4(15)	1(100)	5(19)	1(50)
TH				
< 75	0	0	0	0
75 - 150	1(4)	0	2	0
150 - 300	6(24)	0	8(32)	0
> 300	18(72)	1(100)	15(60)	3(100)
TH				
< 300	7(27)	0	9(36)	1(33)
300 - 600	9(35)	0	8(32)	2(67)
> 600	10(38)	1(100)	8(32)	0
Cl				
< 250	12(46)	0	12(48)	0
250 - 1000	10(38)	0	10(40)	3
> 1000	4(16)	1(100)	3(12)	0
No ₃				
< 45	17(65)	0	16(61)	1(33)
> 45	9(35)	1(100)	10(38)	2(67)
Ca				
< 75	12(46)	0	14(54)	2(67)
> 75	14(54)	1(100)	11(46)	1(33)
Na				
< 200	21(81)	0	18(72)	1(33)
> 200	5(19)	1(100)	7(28)	2(67)
F				
< 1	15(60)		18(72)	
1 - 1.5	7(28)		5(20)	
> 1.5	3(12)		2(8)	
Mg				
< 100	19(76)		18(72)	
> 100	6(24)		7(28)	

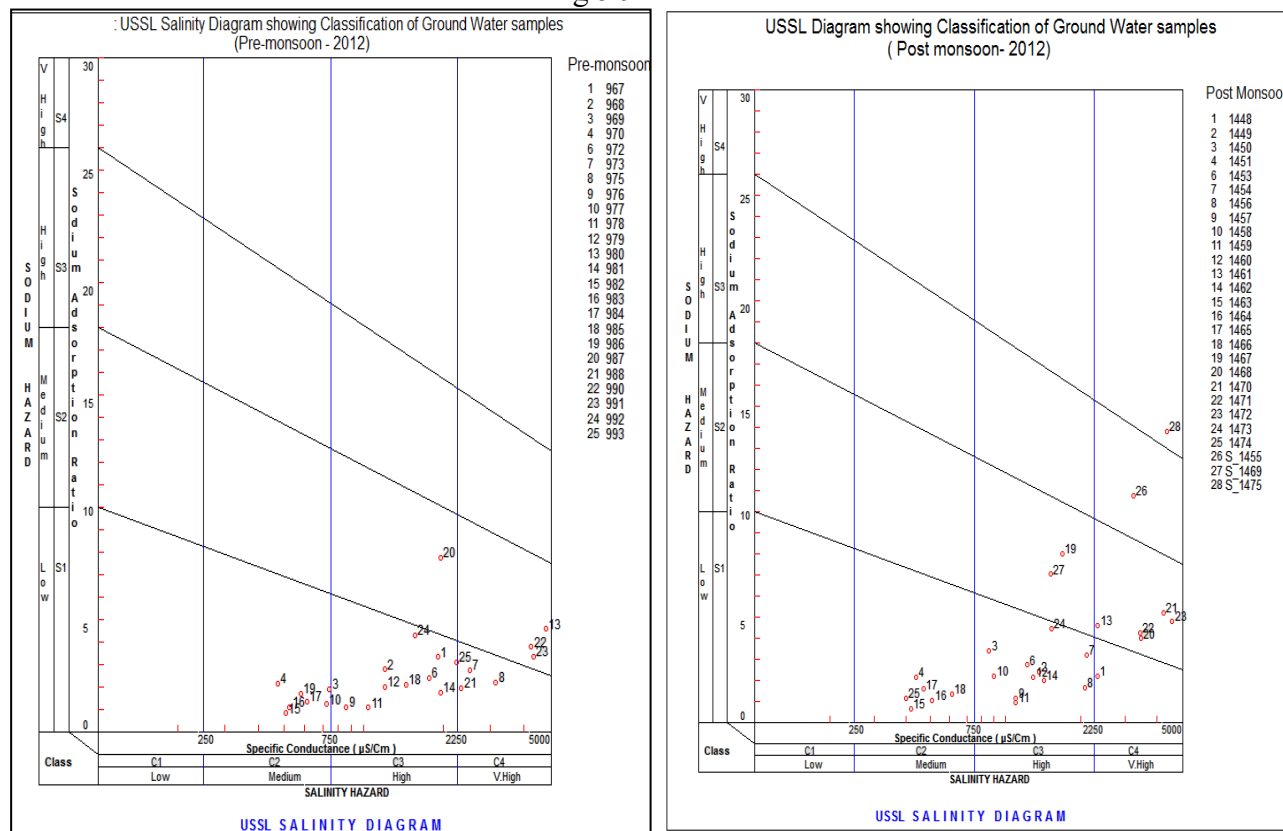
Ca²⁺ concentration is within permissible limit (75 mg/l) in 46 and 54% of samples, during pre and post-monsoon respectively. The maximum admissible limit of Na⁺ is 200 mg/l, according to this, 19 and 28 % of samples have concentration above admissible limit during pre and post-monsoon seasons respectively. The desirable limit for Cl⁻ in potable water is 250 mg/l which can be permitted up to 1000 mg/l in Indian conditions (BIS 2012). In the study area 46 and 48 % of samples are within desirable limit while 16 and 3% of samples exceed permissible limit (>1000 mg/l). In all 35 and 38 % of samples have nitrate concentration higher than the recommended levels of 45 mg/l (BIS 2012). The concentration of fluoride is beyond permissible limits of drinking water standards in 12 and 8 % of samples.

5.4 Suitability of water for Irrigation Use

The Wilcox plot (USSL 1954) is used to find out suitability of groundwater for irrigation (Fig.5.9). During pre-monsoon, the groundwater falls in C₂S₁, C₃S₁, C₄S₁, C₄S₂, C₃S₂ class (28%, 40%, 12%, 12 % and 4 % respectively) indicating salinity hazard is 'Medium to Very High' and sodium hazard is 'Low to Medium'. During post-monsoon, the groundwater falls in C₂S₁, C₃S₁, C₄S₁, C₄S₂, C₃S₂, C₄S₃, C₄S₄ class (24%, 44%, 4%, 20 %, 8 %, 4 %, 4 % respectively)

indicating salinity hazard 'Medium to Very High' category and sodium hazard 'Low to very high category'. Salinity hazard 'Medium' to 'High' requires treatment before irrigation applications, lest it reduces the soil nutrition capacity for plant growth. The low sodium (alkali) hazard and high salinity (conductivity) hazard represents the suitability for salt tolerant plants but restricts its suitability for irrigation, particularly in soils with restricted drainage (Karanth 1987). During post monsoon samples in medium to high sodium hazard have increased.

Fig.5.9



5.5 Industrial purpose

The standards of water quality requirements vary depending upon the nature of industrial unit. The more common problems faced by industries in any area are incrustation and corrosion. Water with HCO_3^- more than 400 mg/l or TH more than 300 mg/l or SO_4^{2-} more than 100 mg/l, may cause incrustation, and Water, with p^{H} less than 7 or TDS more than 1000 mg/l or Cl^- more than 500 mg/l may cause corrosion (Johnson, 1983).

The content of HCO_3^- exceeds the limit of 400 mg/l in 8 and 4 % of groundwater samples, the concentration of SO_4^{2-} exceeds > 100 mg/l in 20 and 52 % of samples, while TH is more than 300 mg/l in 76 and 64 % of samples during pre and post monsoon respectively. These waters can develop incrustation on metal surfaces and hence are not recommended for industrial purpose. The water having p^{H} more than 7 is free from corrosion. However TDS with more than 1000 mg/l is observed in 44 and 36 % of samples, while the concentration of Cl^- exceeds more than 500 mg/l in 36 and 32 % of samples during pre and post monsoon seasons respectively. These waters have potential to develop corrosion on metal surfaces, hence not suitable for industrial use.

6.0 IMPACT OF DUMP YARD ON GROUND WATER AND STATUS OF CONTAMINATION

6.1 Criteria for selection of dumping site

Government of India in its Gazette(2013) has given criteria for selection of landfills, some relevant points are

- Selection of landfill sites shall take into consideration the relevant environmental issue.
- The landfill site shall be away from habitation clusters, forest areas, water bodies, monuments, National Parks, Wetlands and places of important cultural, historical or religious interest and the distance to be maintained, as prescribed by the State Environment Impact Assessment Authority (SEIAA) on a case to case basis.
- The hazardous waste shall be managed in accordance with the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008, as amended, from time to time. The E-waste shall be managed in accordance with the e-Waste.
- Prevention of runoff from landfill area entering any stream, river or pond.
- Ground Water in and around landfill shall not be used for drinking or other use, unless it meets specified standards.
- Diversion of stream water drains promote pollution of surface water.
- Construction of non-permeable lining system at the base and walls of waste disposal area.

Prevailing conditions around dumping site

In the study area it can be seen that water bodies are present both on northern and southern part of dumping site (Fig.2). The garbage dumped on hill slopes slowly goes down as sheet flow (photographs), and mingle with water body on the north within short time. Part of garbage slowly move south and may seep into subsurface and join groundwater. The contaminated water thus moves down towards its down gradient through surface water bodies and contaminate tanks located downstream or also through sub-surface water i.e ground water enroute its journey towards downstream. It is pertinent to note that the prevalence of lineaments towards north and south of dumping site is high. These lineaments are weak zones along which movement of pollutants likely to be high. Integrated hydrogeological study reveal the fracture zone in NW-SE direction, similar to major lineament zone and thickness of weathering zone as high as 27 m near Irlagutta. This support that the site is not environmentally safe and is vulnerable to contamination.

6.2 Status of Contamination

Comparison of ions in upstream and downstream

Impact of dumping site on ground water is nil in upper part of the watershed. Hence, the chemical analysis data of ground water in up stream of watershed i.e at higher topographic elevation may be taken as background values. For comparative study, water samples are collected during pre and post-monsoon, 2012; In all 5 samples (Table-6.1) from up stream area, non contaminated zone, (Zone-1), 20 samples from lower part of watershed i.e contaminated zone (Zone-2), while 4 samples from surface water tanks (Zone-3) in contaminated zone. It can be seen that in Zone-1 ground water is fresh with TDS <500 mg/l, low Cl (76 premonsoon; 92, post-monsoon), Na (41,39 mg/l), SO₄ (41,77 mg/l). In contrary Zone-II samples have high TDS <500 mg/l (average 1335 mg/l, pre; 1332 mg/l, post), high Cl (641, 599 mg/l), Na (172, 192 mg/l), Mg (115, 94 mg/l), SO₄

Table – 6.1
Average concentrations in ground water and surface water
Jawaharnagar waste disposal site (2012-13)

Parameter	Affected area (n=25)		Tanks (n=4)		Unaffected (n=5)	
	Pre	Post	Pre	Post	Pre	Post
pH	7.66	8.36	8.0	8.78	7.93	8.59
EC (in us/cm)	2395	2368	34570	2588	7.09	720
TDS (mg/l)	1336	1332	4110	1530	448	425
TH (mg/l)	839	762	688	399	286	271
Ca ²⁺ (mg/l)	147	150	114	56	73	48
Mg ²⁺ (mg/l)	115	94	98	63	26	37
Na ⁺ (mg/l)	171	191	813	358	41	39
K ⁺ (mg/l)	2.15	2.14	607	90	2	1
HCO ₃ ⁻ (mg/l)	247	130	226	105	204	59
Cl ⁻ (mg/l)	640	599	1684	573	77	93
SO ₄ ⁻ (mg/l)	69	141	536	233	42	77
NO ₃ ⁻ (mg/l)	40	63	120	54	63	83
F ⁻ (mg/l)	0.79	0.70	1.1	0.6	1.62	1.27

Table- 6.2
Ionic Ratios in Ground Water Polluted/Non Polluted areas
Jawahar Nagar waste Dumping Site
Affected area

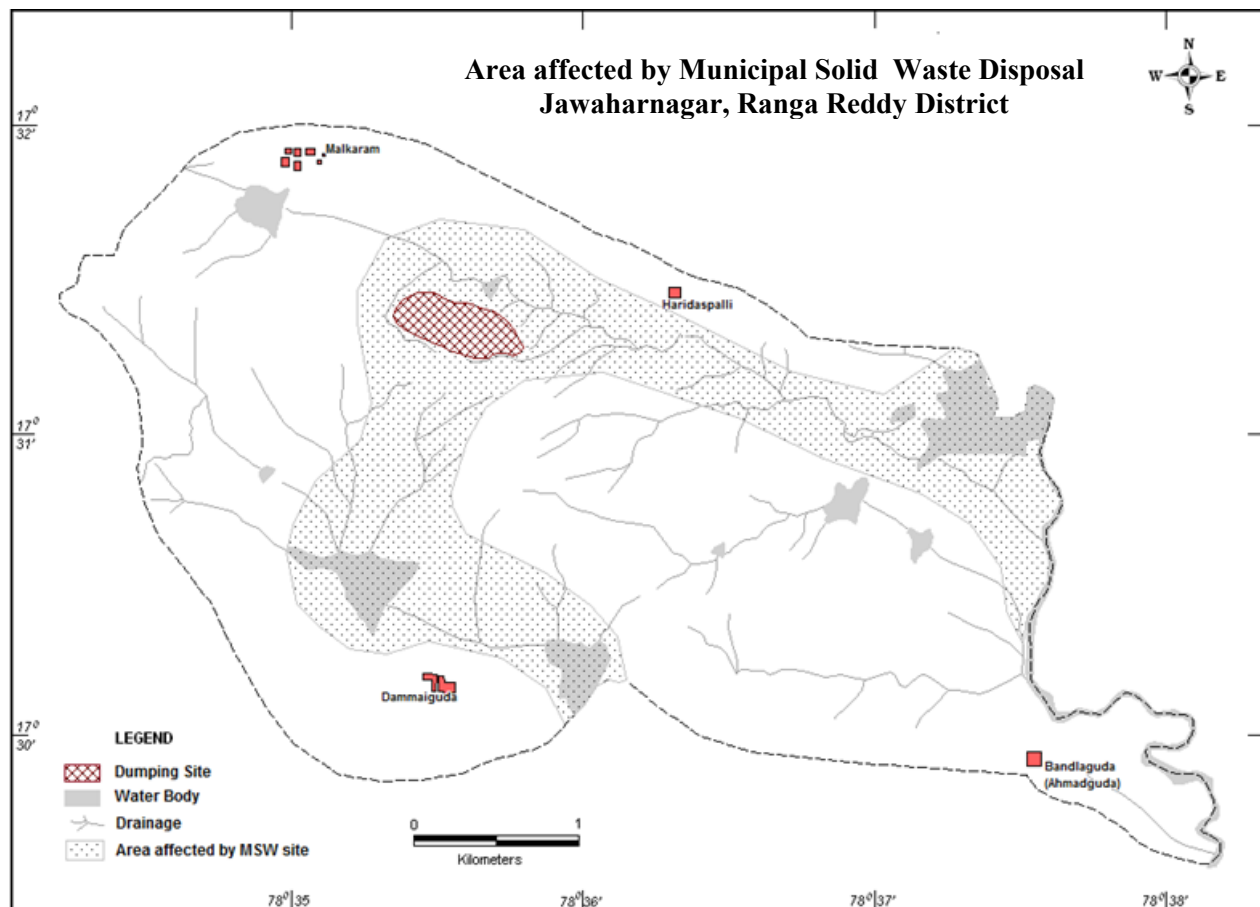
Sl No	Pre-Monsoon			Post-Monsoon		
	HCO ₃ /Cl	SO ₄ /HCO ₃	TA/H	HCO ₃ /Cl	SO ₄ /HCO ₃	TA/TH
1	0.89	0.33	0.20	1.046	0.23	0.31
2	1.69	0.24	0.32	0.286	1.67	0.46
3	6.00	0.10	0.28	0.477	1.66	1.07
4	8.60	0.06	0.68	2.357	0.37	0.43
5	0.02	0.36	0.25	0.013	5.73	0.09
7	0.07	1.83	0.73	0.088	2.39	0.28
9	0.14	0.79	0.48	0.100	1.62	0.19
11	0.96	0.37	0.87	0.247	1.82	0.57
13	0.96	0.41	0.38	0.192	2.84	0.60
14	0.06	0.96	0.74	0.075	3.56	0.50
15	0.11	0.77	0.71	0.103	3.04	0.57
19	0.45	0.33	0.52	3.750	0.00	0.10
20	4.50	0.11	0.42	0.232	1.50	0.75
21	0.50	0.53	0.38	0.043	4.24	0.27
22	0.11	0.50	0.58	0.155	0.61	0.15
24	0.14	0.09	0.35	0.030	6.09	0.25
25	0.09	0.18	0.36	0.056	2.07	0.17
26	0.65	0.19	0.34	0.140	1.94	0.40
27	0.24	0.29	0.37	1.400	0.51	0.38
Min	0.02	0.06	0.20	0.01	0.00	0.09
Max	8.60	1.83	0.87	3.75	6.09	1.07
Average	1.38	0.44	0.47	0.57	2.20	0.40

Unaffected area

Sl No	PRE-MONSOON			POST-MONSOON		
	HCO ₃ /Cl	SO ₄ /HCO ₃	TA/H	HCO ₃ /Cl	SO ₄ /HCO ₃	TA/TH
10	2.05	0.23	0.41	0.178	3.25	0.57
12	0.58	0.36	0.79	0.271	1.31	0.55
16	3.27	0.18	0.62	0.833	0.82	0.36
17	2.00	0.32	0.75	1.000	0.91	0.46
18	1.83	0.25	0.59	0.190	7.65	0.76
Min	0.58	0.18	0.41	0.18	0.28	0.36
Max	3.27	0.36	0.79	1.00	7.65	0.76
Average	1.95	0.27	0.63	0.49	2.79	0.54

(69,14 mg/l) concentrations. Similarly, the samples in Zone –III have very high load of pollutants with TDS (average, 4110 and 1530 mg/l), Cl (average 1683 mg/l), Na (average, 813 mg/l) etc., High HCO_3/Cl , low SO_4/HCO_3 , high TA/TH represent fresh water type. Contrary, it can be seen from Table- 6.2, downstream area samples are characterized by low HCO_3/Cl , high SO_4/HCO_3 , low TA/TH values, which suggests that ground water is affected by contamination (Fig.6.1).

Fig.6.1



It is clearly evident from water quality monitoring that uncontrolled dumping of waste affected the surface and ground water quality as seen from high concentrations of TDS, cations and anions in surface water and also TDS, Mg, Cl^- , SO_4^{2-} , NO_3^- , Na^+ in majority of groundwater samples, TOC, BOD, COD and low HCO_3/Cl , high SO_4/HCO_3 , low TA/TH ionic ratios. As there is no natural or other possible reason for such high concentrations of these pollutants, it can be concluded that leachate has significant adverse impact on waters particularly surface water quality near the MSW site. Geophysical investigations also corroborates the impact of leachate. The influence of pollution is more up to a distance of 60 m in the northern side of the Madyala vagu, whereas in the southern side it is up to 30m distance apart from nearby tanks. The results obtained from the sounding carried out near the tank at Cheriya village show that weathered zone is up to a depth of 16 m with resistivity of 20 Ohm m. The resistivity shows the extent of deterioration of the quality of the ground water around the tank, which is one of the main sources of water in the villages.

The fact that the Cherial tank located about 3-4 km, downstream of site contains pollutants like TOC, COD, BOD shows the effect of contamination. The presence of contaminants in ground water even at a distance of 5 km near Ahmedguda, **amply** support the observation that ground water too is adversely affected by dumping site. Groundwater which is fresh little upstream of site can not be expected to contain such high load of constituents within short distances.

The ill effects of ground water contamination due to dumping site has also been covered by press and electronic media.

The lateral and vertical flow of water in hard rock terrain is slow and complex due to heterogenous fracture pattern. This, to a certain extent, restricts the movement of contaminants from source to receptors, which could be the one reason for spatial variations of constituents. The influence of leachate percolation is much evident on the surface water bodies and some vulnerable locations. The leachates are the prime sources of all ions in the groundwater, though meagre lithogenic inputs from rock–water interactions contribute. Various factors like soils, topography, and flow dynamics have largely controlled the migration of leachate to the groundwater system. The study has brought to light the vulnerability of site to the contamination of waters to leachate effect. The present study warrants for a proper solid waste management as a long-term policy in the city, which should focus on identification of proper sites where the vulnerability to pollution could be minimal and proper collection, disposal and treatment facilities.

7.0 SUGGESTIONS

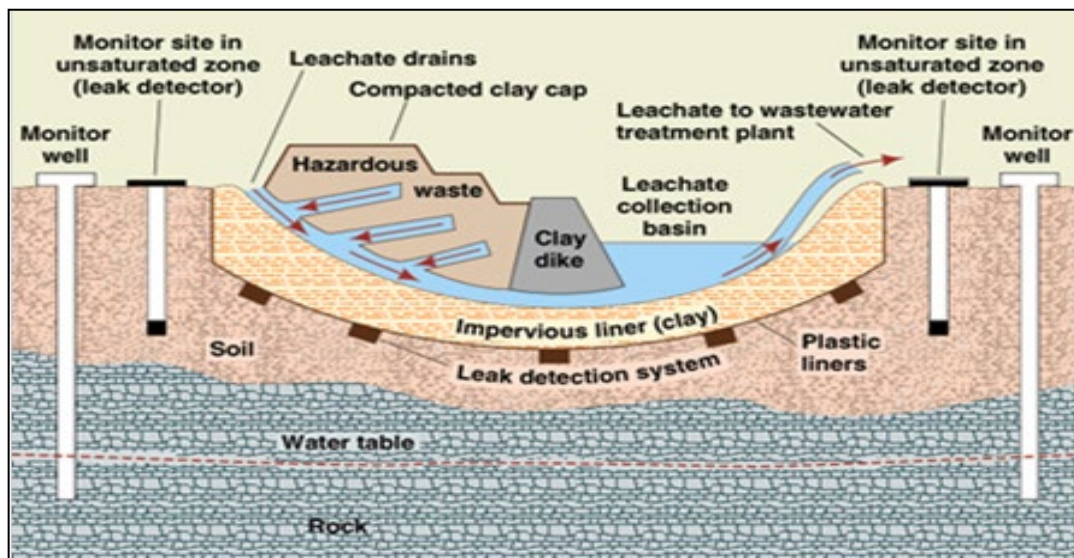
There is need to monitor ground water and surface water quality on continuous basis, in order to assess the impact of dump yard spatially and depth-wise. It is suggested to construct purpose built piezometers (phreatic-30 m & fractured aquifer -100 m) at three locations (17° 35' 56":78° 37' 02"; 17° 30' 22" ; 78° 35' 47") third one can be little downstream of study area) at vulnerable locations for long term water quality monitoring of all parameters specified by BIS, 2012 including organic contaminants. Quality of Water from all the wells should be taken up and contaminated wells must be sealed. All measures are to be taken to protect human health and environment.

It is felt necessary to continue groundwater and surface water quality monitoring for three years during pre and post monsoon from select key wells for complete basic, trace metals, BOD/COD, TOC to study temporal variations and mass transport modeling studies. The sampling area needs to be extended further downstream to know the effect of contamination. Similarly geophysical surveys are to be continued so as to cover the complete area.

As per Government of India gazette (2013), safe collection and proper segregation of compostable waste at the level of waste generation and collection is required to be done. This would lead to better options and opportunities for scientific disposal of waste, which may reduce contamination in future. Hazardous waste should be separated and landfilling should be restricted to non-biodegradable, inert waste and other waste that are not suitable either for recycling or for biological processes

As the present site is **non-engineered** site, to arrest further damage, it is advisable to close site in a phased manner and move to engineered landfill site which needs to be selected after considering hydrogeological and environmental considerations where there is minimal infiltration and minimal possible damage. Engineered landfill sites are provided with impermeable liner and drainage systems at the base of the landfill (Fig.7.2), which will not allow leachate to percolate into the sub-soil.

Fig.7.2
Model of Engineered landfill site



Acknowledgements

The author thank Sri A.D.Rao, Regional Director for his guidance in preparation of the report and Sri G.Sudarshan, the then Regional Director (I/c) for providing logistics and guidance provided during investigation. Thanks are due to S/Sri G.Ravi Kumar, K.Maruti Prasad, P. Satya Kumar for carrying out sampling, chemical analysis and inputs for preparation of report. The assistance rendered by Sri. B.J.Madhusudhan and Dr.V.S.R.Krishna in preparation of maps is highly acknowledged.

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केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार.
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA.
Date: 1.09.2024

File No. CM-13013/19/2021-TECH-RD-CHENNAI-RD (Chennai)

To,

1. The Expert members
(As per list)

2. The Commissioner

Greater Hyderabad Municipal Corporation CC Complex,
Tank Bund Road, Lower Tank Band, Hyderabad, 500063

3. The Member Secretary

Telangana State Pollution Control Board
A-3, Paryavaran Bhavan, Sanath Nagar Rd,
Sanath Nagar Industrial Estate, Sanath Nagar,
Hyderabad, Telangana 500018

Subject: Minutes of the second meeting held on Aug 27, 2024 in O A No 199/2021 (SZ) in the matter of Sri Shankar Narayana Bala Krishna Telangana and Ors. Vs State of Telangana Rep by its Chief Secretary Hyderabad and Ors.

Sir,

This is in reference to the second meeting of expert group held on 27th August 2024 at 4.30 PM through VC on above captioned subject.

The minutes of the meeting is enclosed herewith for kind perusal and necessary action in the matter.

Yours faithfully,


(Divya Sinha)

Director & DH, UPC-II, CPCB

Encl.: As above

Copy to:

1. PS to CCB: For Kind information, Please.
2. PS to MS: For Kind information, Please.
3. Regional Director, CPCB RD Chennai: For Information, Please
4. DH, Law Div.: For information, Please.



(Divya Sinha)

‘परिवेश भवन’ पूर्वी अर्जुन नगर, दिल्ली - 110032.

Parivesh Bhawan, East Arjun Nagar, Delhi - 110 032.

दूरभाष / Tel : 43102030, 22305792, वेबसाइट / Website: www.cpcb.nic.in



Central Pollution Control Board

Parivesh Bhavan, East Arjun Nagar, Delhi-110032

Minutes of the meeting held on Aug 27, 2024 in O A No 199/2021 (SZ) & I A NO 96/2022 (SZ) in the matter of Sri Shankar Narayana Bala Krishna Telangana and Ors. Vs State of Telangana Rep by its Chief Secretary Hyderabad and Ors.

In continuation to the Meeting held on 23.08.2024, a Meeting was held on August 27, 2024 at 4:30 P.M. via video conferencing, under the chairmanship of Member Secretary, CPCB, with experts to deliberate on draft action plan prepared by GHMC. Representatives from the Greater Hyderabad Municipal Corporation (GHMC), Telangana State Pollution Control Board and officials from the CPCB Regional Directorate, Chennai as well as the CPCB Head Office, also participated in the meeting. The list of participants is attached as **Annexure I**.

Divisional Head UPC-II, CPCB, welcomed the participants & intimated that draft action plan prepared by GHMC to be presented today and shall be reviewed by the experts for their inputs.

Subsequently, GHMC presented the Action plan for managing of fresh and stored RDF on its premises. However, it was observed that all issues raised in CPCB report dated 14.07.2024 had not been addressed. Presentation is attached as **Annexure-II**.

CPCB inquired about the observations related to processing capacity of the SWM facilities made by GHMC on the CPCB report dated 14.07.2024. However, Telangana PCB could not comment on the same.

CGWB informed that a more comprehensive monitoring network would be required to assess the extent of impact of the dumpsite on the ground water. CGWB has shared the Study conducted by it during 2012 around Jawahar Nagar dumpsite. (**Annexure-III**)

Expert from MoHUA suggested to provide the list of 33 cement plants identified by GHMC within a periphery of 300 KM & to check the willingness of those plants for offtake of RDF generated at the site. She also inquired about preventive measures taken for prevention of fire as there is huge quantity of RDF stored in the premise.

In response GHMC responded that sufficient measures have been taken for fire prevention at the site where the RDF is stored.

It was further informed by the experts that assistance from three organizations – NIH, CGWB and NGRI would be required for remediation of contamination in ground water and surface water bodies (ponds) in and around the HIMSWM Project.

Based on deliberations held, following actions were decided:

1. GHMC to present a comprehensive Action Plan addressing the recommendations made in in the CPCB report dated 14.07.2024. (**Action: GHMC**)
2. TGPCB & CPCB, RD Chennai to jointly verify the observation on data as submitted by GHMC vide letter dated 24.08.2024. ((**Action: TGPCB, CPCB, RD Chennai**)
3. The next meeting shall be held on 28.08.2024 at 10 A.M. under the chairmanship of Chairman, CPCB.
The meeting ended with vote of thanks to the chair.

List of participants.

SN	Name of participants	Designation	Organization
1.	Sh. Bharat Kumar Sharma	Member Secretary	Central Pollution Control Board
2.	Mrs. Divya Sinha	Director & DH, UPC-II	Central Pollution Control Board
3.	Mrs. H.D. Varalaxmi	Regional Director	RD Chennai, Central Pollution Control Board
4.	Dr. Y.R.S. Rao	Scientist 'G'	National Institute Hydrology (NIH) Roorkee
5.	Dr. Suresh Kumar	Assist. Chemist	Central Ground Water Board (CGWB)
6.	Dr. M.J. Nandan	Chief Scientist	National Geo Physical Research Institute (NGRI) , Hyderabad
7.	Ms. K. Sravanthi Jeevan	Assistant Adviser	Ministry of Housing and Urban Affairs
8.	Dr. M.P. Patil	Chief Scientist	CSIR - NEERI,
9.	Mrs. Bineesha Payattati	Executive Director	International Institute of Waste Management, Bangalore
10.	Ms. Rani V.R.	Scientist 'D'	Central Ground Water Board (CGWB)
11.	Mrs. Nigam Aggarwal	Director	Dept. of Env., GNCTD
12.	Sh. Koteswar Rao	Chief Executive Engineer	Greater Hyderabad Municipal Corporation
13.	Sh. Srinivasa Reddy	Executive Engineer	Greater Hyderabad Municipal Corporation
14.	Mrs. Srujana Shree	SEE	Telangana State Pollution Control board
15.	Mrs. Poornima B.M.	Scientist 'D'	RD, Chennai, Central Pollution control Board
16.	Mrs. Suniti Parashar	Scientist 'C'	Central Pollution Control Board
17.	Sh Madnesh Kumar Dubey	Scientist 'B'	Central Pollution Control Board
18..	Sh. Amit Kumar	Scientist 'B'	Central Pollution Control Board



GHMC Action Plan on CPCB Recommendations

CPCB Recommendations	GHMC Action Plan
• 2.2.1 i. M/s Hyderabad Integrated Municipal Solid Waste Management Project is the only facility to manage the entire solid waste generated from entire GHMC. The premises of the facility including the capped dumpsite, is spread over an area of 339 acres. The site receives about 8,100 Metric Ton (MT) of solid waste per day. ii. The M/s Hyderabad Integrated Municipal Solid Waste Management Project is operated by M/s Re Sustainability Ltd., on the behest of Greater Hyderabad Municipal Corporation (GHMC) since the year 2012. iii. After commencement of operation by M/s Re Sustainability Ltd., scattered and unscientific open dump of about 12 lakh MT of solid waste, spread across 313 acres of land was shifted to an area of 125 acres of land and about 214 acres of land was reclaimed for other solid waste management facilities. iv. As per information provided by GHMC, 8,100 TPD of solid waste generated from GHMC area and other urban local bodies (ULBs) is received at HIMSWM Project. The site comprises of the following features/operations; a. Capped landfill of size 125 acres b. Compost plants of capacity 3 x 680 TPD (~ 2000 TPD) c. Trommels capacity for solid waste processing – 19x35 TPH & 2x50 TPH with total capacity of 15300 TPD (as informed 20 hrs operation time) d. Waste segregation facility (called as RDF unit of 5000 TPD)	iii. ...unscientific open dump of about 120 Lakh Mt of solid waste iv. b. Compost plant of capacity 4,000 TPD (Note: i. as per Readiness Certificate issued by EPTRI, the I.E for the project. ii. This shall be validated by TGPCB Slide 2

CPCB Recommendations	GHMC Action Plan
2.2.1 iv. e. Land-fill gas collection system in capped area (155 bore-holes and flare stacks) – Gas handling, concentration and bottling unit of 750 KL of methane per day. f. Waste to Energy (WTE) Plant – 24 MW capacity; another unit of 24 MW capacity is under construction. g. Leachate collection and treatment systems (1nos- 01 MLD capacity) for 533 KL per day of leachate generation h. Plastic Waste recycling facility (capacity – 1000 TPD) i. Active dumping of semi-processed solid waste (un-utilized RDF) j. Sanitary landfill (27 acres) for rejects/inert materials	e. ...Gas handling, concentration and bottling unit of 5 MT of methane per day. f. Waste to Energy (WTE) Plant – 24 MW capacity; 14.5 MW capacity WTE commissioned in March 2024 at Dundigal. Another unit of 24 MW capacity is under construction.

- 2.2.1
- vi. The incoming waste to the facility is not segregated, thus unit receives mixed waste, which is passed through Trommels to separate larger fractions (+70 mm) (4300 TPD) of solid waste called as RDF. **A fraction of said RDF or semi-processed solid waste is being utilized in 24 MW capacity WTE Plant (about 1200 TPD) for electricity generation and 340 TPD of RDF is being sent to cement industry. Hence, the total utilization of RDF per day at present is about 1540 TPD and remaining 2760 TPD is stored in temporary covered dumps within the premises.**
- vii. It is observed that excess (un-utilizable) semi-processed solid-waste was initially stored at one identified location within the premises, which is 11 lakh MT stored in 61 acres of land near to RDF processing facility, located in west direction of processing plant and a total height of this is about 60m. It was observed that an active storage of semi-processed solid waste has taken place between the capped sites and also above the capped areas. It was also observed that a temporary cap of 1.5mm HDPE sheet is laid over the levelled mounds of solid waste. At present 68,17,487 MT of un-utilized semi processed waste is stored in the processing facility.
- viii. Accumulated semi-processed waste (RDF) in last 12 years is given in below Table 1:

vi. A fraction of said RDF or semi-processed solid waste is being utilized in 24 MW capacity WTE Plant (about 1200 TPD) **& 14.5 MW capacity WTE Plant (about 800 TPD)** for electricity generation and 340 TPD of RDF is being sent to cement industry. Hence, the total utilization of RDF per day at present is about **2340 TPD and remaining 1960 TPD** is stored in temporary covered dumps within the premises.

The data in the above table is clearly indicating inadequacy of solid waste treatment facility to process the entire quantity of waste being disposed at the said site.

CPCB Recommendations	GHMC Action Plan
2.2.1 Viii. The processing capacity of trommels is 15300 TPD, considering 20 hrs operation time. The existing trommels can hence process 8100 TPD of waste in 11-12 hrs. 4300 TPD of +70mm size fraction (Refused derived fuel (RDF)) and 3800 TPD of -70mm fraction is generated upon processing of 8100 TPD of mixed waste in the trommels. The HIMSWM Project has capacity to process 1200 TPD of RDF in the WTE Plant. Additional 340 of RDF is being sent to Cement industry. Accordingly, only 1540 of RDF is utilized, and the remaining 2760 TPD of RDF (+70 mm) is stored in the HIMSWM Project. Further, 3100 TPD of -70 mm fraction is processed in the Compost plant. However, the compost plant processing capacity is only 2000 TPD. Hence, the remaining 1800 TPD of -70mm fraction is stored in HIMSWM Project. In view of above, only 3540 TPD (43.7%) of the total received waste 8100 TPD is fully utilized and the remaining 4560 TPD (56.3%) of semi-processed waste (2760 TPD of +70 mm fraction and 1800 TPD of -70 mm fraction) accumulates in the HIMSWM Project premises. Additionally, 1390 TPD of rejects is generated during processing of 2000 TPD of -70 mm fraction in the composting facility which is disposed of the Sanitary landfill (SLF) located in HIMSWM Project.	...the compost plant processing capacity is 3800 TPD. Hence, ~~the remaining 1800 TPD of -70mm fraction is stored in HIMSWM Project.~~ In view of above, only 6140 TPD (75.8%) of the total received waste 8100 TPD is fully utilized and the remaining 1960 TPD (24.2%) of semiprocessed waste (+70 mm fraction only) accumulates in the HIMSWM Project premises. 1392 TPD of rejects is generated during processing of 3800 TPD of -70 mm fraction in the composting facility which is disposed of in the Sanitary landfill (SLF) located in HIMSWM Project.

CPCB Recommendations	GHMC Action Plan
2.2.1 ix. In the year 2012, a sanitary landfill was constructed in an area of about 13 acres which was closed in 2019. In the year 2020, another landfill was constructed in 27 acres of land at the south side of processing facility and which is presently in operation. Three cells were constructed, out of which two cells are closed and one cell is currently operational. About 1390 TPD of rejects/ inert material and residue generated from leachate treatment plants is disposed in the sanitary landfill. The SLF can be utilized for disposal of waste for only next six months as per the available capacity of the SLF	The residue generated from the legacy leachate treatment plant is being disposed in a sanitary landfill as per direction from TSPCB

CPCB Recommendations	GHMC Action Plan
2.2.1 ix. It is observed that the entire area of Jawaharnagar waste processing has been utilized and scope for expansion is limited. As explained in above paras, there is no additional storage space, and the semi-processed waste is being stored in spaces between capped sites and above the capped sites leading to additional quantity of leachate being generated from the dumpsite.	Action: The semi-processed waste being stored temporarily in spaces between capped sites and above the capped sites for want of preparation of lined storage area is now being shifted (in progresss)

4.0 Conclusions and Recommendations

- i. The Hyderabad Integrated Solid Waste Management Project at Jawaharnagar is not adequate for processing/utilizing entire received waste (8100 TPD) from Hyderabad city. The facility can utilize about 43.70% of waste against the generation of 8100 TPD and the rest 56.3% (i.e. 4560 TPD) is being accumulated in the processing facility as semi-processed waste.
- The semi-processed waste is being dumped in the available spaces in the premises of facility, including the spaces between the capped cells and also above the capped cells causing additional leachate generation.

- Currently, the fresh municipal solid waste (MSW) received at Jawahar Nagar Site (JWNR) stands at about 8100 TPD from GHMC and surrounding 15 municipalities. GHMC is processing all the waste received.
- After pre-sorting, the segregated combustible fraction (SCF) constitutes around 53% of the waste, resulting in approximately 4300 metric tons per day of RDF generation.

Description	UOM	FY24	Remarks
Fresh MSW	MT	8100	
RDF Portion	MT	4300	
AvailableInfrastructure for disposal of RDF			
WtE-JWNR Phase 1	MT	1200	Operational
WtE-2 (Dundigal)	MT	800	Operational
SCF Co-processing Cement Industries	MT	340	
RDF Unit	MT	1000	Under Trial run
Under Construction Infrastructure for disposal of RDF			
WtE-JNW(Phase-2)	MT	1200	To be operational by Jan'25
Total	MT	4540	

- After processing fresh waste to the tune of about 8100 TPD, all the RDF recovered is being processed and nothing will be left for storage after commencement of WtE phase II.
- The semi-processed waste is stored in a lined cell with top cover in the space available adjacent to capped landfill with proper leachate collection system.

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations ii. In compliance to Hon’ble NGT order dated December 7, 2017 in OA No. 780 of 2017 in the matter of Peddi Mohan Reddy & Ors VS. State of Telangana, (PB) Delhi; GHMC has identified three sites at Pyaranagar, Lakdaram and Khanapur for processing solid waste generated from GHMC area and to minimize the load on Jawaharnagar facility. Even after 07 years, the other processing facilities have not been made operational. - GHMC may either develop these sites on priority, and manage the fresh waste in these facilities instead of accumulating it in HIMSWM Project or develop additional processing/utilization capacity at HIMSWM Project. GHMC to evaluate the same and take immediate actions in this regard. - Further, GHMC to operationalize the WTE Plant being set up in HIMSWM Project and also identify additional avenues for processing of RDF accumulated (68.17 lac T) on its premises.	- As the Jawahar Nagar facility is not adequate for future waste generation from the entire catchment, GHMC already identified 3 new sites for development of the processing & disposal facilities which are at various stages of approvals for establishment of new facilities. - As such, GHMC plans to limit the waste intake at Jawaharnagar to between 4000 - 5000 tons per day and reduce the same further in future. - Following locations are under consideration - Dundigal-85 acres, - Pyaranagar-150 Acres - Lakdaram-100 Acres, - Malkapur - 200 Acres GHMC will ensure that processing of the waste at these sites shall commence within 12 to 24 months. 24 MW WTE phase –II is slated for commissioning by Jan’25 which will consume anither 1200 MT of RDF Additional avenues for EDF disposal: we have identified around 33 (List enclosed) Cement Units within 300 Kms with a combined fuel requirement of 21,200 TPD. Considering 15% TSR, RDF requirement translates to 3200 TPD, Support Required: CPCB/TGPCB has to facilitate necessary support/permissions from KSPCB, APPCB and MPPCB for the above offtake plan to materialize

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations iii. Further, the other accumulated semi-processed waste in HIMSWM Project also needs to be processed/utilized on priority. Thereafter, the capped site is to be opened gradually in phase wise planned manner for biomining.	Proposed plan for disposal of stored RDF: • There are approximately 33 Cement Units within 300 Km with a combined fuel requirement of 21,200 TPD. Considering 15% TSR, the RDF requirement translates to 3200 TPD. • Plan A : It is proposed to clear the stored RDF within 5 years by setting up 5 (five) RDF units with processing capacity 1000 TPD each at appropriate locations. On average, these units will generate 3500 TPD of RDF from the stored material. • Plan B: Consumption of RDF in the WTE. • As per NGT Order Point 8 & 10 <i>“CPCB as well as the GHMC is finding it difficult to remove the capped waste”</i> <i>“If the appropriate solution in a time bound manner and the capped area”</i> • Further we request not to open the scientifically capped dumpsite Support Required: • Consistent offtake from Cement industries has been a major challenge due to varying usage of AFR and Coal price trends. • CPCB/TGPCB has to facilitate necessary support/permissions from KSPCB, APPCB and MPPCB for the above offtake plan to materialize.

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations iv. The groundwater in an around the dumpsite is contaminated as per the analysis of ground water of all samples monitored during the inspection. Further, as per the monitoring carried out by TSPCB, increasing trend in concentration of COD & TDS has been observed in the groundwater collected from the said area, indicating contamination of the groundwater with leachate.	Page No. 130 • Analysis represent last 6 month data while the dumping gappened since past 20 years. CPCB shall direct the TSPCB to review the data and present the facts. • Jawahar Nagar facility is spread over 339 acres as an erstwhile open dumpsite, waste dumping started in 2001 from Alwal and Kapra Municipalities. • Starting from 2004, Jawahar Nagar dump site started receiving unsegregated MSW from all over Hyderabad. • Prior to the initiation of the reclamation works in 2012-13, the site functioned as a uncontrolled solid waste dumpsite. • Approximately 12 million metric tons of waste was present on the site at the time of handing over to the Concessionaire for reclamation. • This prolonged period of accumulation of mixed MSW over the site has led to contamination of surrounding water bodies and ground water. • Ground water sample in 2013-14 in the areas downstream of the legacy leachate ponds indicate an average COD level of 300-3642 mg/l and average TDS level from 4992-13968 mg/l, • Ground water sample collected from villages/settlement around year 2013-14 located downstream of the site indicated average TDS level from 910-6410 mg/l. • The above constitute the documented baseline of ground water quality in the area, attributable to historical open waste dumping practice. • The legacy waste was confined to a footprint of around 125 acres and scientifically capped, thereby 234 acres of land was reclaimed. • Ground water samples post completion of capping have shown significant decline in the downstream monitoring wells. TDS reduced to 1040-5713 mg/l from 4992-13968 mg/l, • Samples collected and tested from neighbouring villages also showed stabilization in the parameters. TDS level reduced to 575-940 mg/l. • Since 2018 GHMC is supplying drinking water to the nearby villages through Water Board connections as well as by water tankers to mitigate drinking water requirements Slide 11

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations v. The MEE condensate from the Leachate treatment plant of 01 MLD capacity, also shows high concentration of COD, indicating the inefficiency of the leachate treatment system. It is partly utilized in ash quenching of WTE plant, while the rest is disposed in natural storm water drain. Conditions for discharge of MEE have not been stipulated in the Consent issued by TSPCB. TSPCB shall immediately prescribe standards for treated leachate and its utilization/discharge and GHMC shall also immediately conduct efficacy assessment of the leachate treatment system and improve its performance.	- GHMC has request to review the statement. We have already submitted a request letter for necessary correction to CPCB vide letter No.SWM/0049/2021-AE-2(SWM)-HO dated 24.8.2024. - However we wish to reiterate that the LTP Consist of three treatment unit, RO, followed by Multiple Effect Evaporator (MEE) followed by Agitated Thin Film Drier (ATFD) System. The RO permeate is used for green belt development, where as condensate from MEE is fully utilized in bottom ash quenching of WtE plant. - Above system is adequate to manage the fresh leachate generation from the facility.

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations vi. The land-fill gas collection system may continue to operate till the time the capped cells are opened for bio-mining. - It is observed that only 14% of the gas generated is utilized, while the remaining is flared. - Efforts to be put to increase utilization of the gas and flaring of landfill gases shall be minimized by increasing the capacity of gas processing plant. - The operator of Integrated Municipal Solid Waste Management Project shall explore the option of utilizing lean landfill gases for possible energy recovery through Waste to Energy Plants.	As per NGT order dated 15.7.2024, Point no: 8 &10 “CPCB as well as the GHMC is finding it difficult to remove the capped waste, further capping should not be permitted. If GHMC is doing it by itself, it is always open to the CPCB as well as the Telangana State Pollution Control Board to step in to stop the same. It is high time for the GHMC and CPCB to stop the blame game, find an appropriate solution in a time-bound manner and treat the capped area.” Action: Based on the recommendation we have explored the possible option. - The Gas engine of 1500 kva is commissioned at Jawaharnagar to utilize 350 cum per hour of purified gas (full capacity of existing CBG plant) to generate the power and the same is being utilized for RDF plant operations. - The Purified gas being supplied to isnapur biomedical incineration unit. - GHMC will ensure appropriate utilization of the entire gas from the capped dump either through GAIL for power generation for captive usage.

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations Vii Fresh waste is being dried for a period of ten days in the composting plant area, prior to trommelling on an unlined area. This area is however, not lined and there is no provision for collection of leachate from this area which has potential for contamination of both ground water as well as surface water bodies. GHMC shall ensure that the drying of waste is done on a lined area and with proper arrangement for collection of leachate from this sections and its conveyance to the leachate treatment plant.	- GHMC submitted the clarification to CPCB vide letter SWM/0049/2021-AE-2(SWM)-HO dated 24.8.2024. - The fresh waste is stored on the Tipping floor for 7 days before the composting plant, which is an SFRC (steel-fibered reinforced concrete) 170mm thick which is impermeable. The design is approved by IIT Madras. - The entire floor of the composting plant has the same floor with a 2% slope connected with the garland drain of RCC to collect the leachate and it is ultimately connected with the main leachate collection system. - GHMC is assuring all the working platforms in the Integrated facility are impermeable with prior approval of construction from an independent engineer.

4.0 Conclusions and Recommendations

viii. TSPCB has to assess the characteristics of the residue which is generated from MEE as well as the MVR to confirm whether or not, it is hazardous waste. It is to be disposed of as per provisions of HWM Rules 2016, if found to be hazardous waste.

TGPCB may examine the same.

4.0 Conclusions and Recommendations

- ix. Temporarily covering the freshly dumped waste till the accumulated waste is processed at the facility
- Lining of the area used for drying of waste and making proper arrangement for collection of leachate from this sections and its conveyance to the leachate treatment plant should be made.
- Empty the unlined leachate storage pond (1 nos.) after treating the accumulated leachate. No artificial storage or guard ponds shall be operated without an impervious bottom and side liners (preferably of 1.5mm thick HDPE liner). Adequate measures, including construction of additional storage ponds, if required, to be taken up to prevent overflow from the leachate storage ponds considering monsoon season also.

- Temporarily covering the waste on the tipping floor except the operational area
- There is no further lining of area required. Since the location mentioned is tipping floor for which is with SFRC flooring.
- In respect of one of the unlined legacy leachate pond - it is already cleared and lining works are in progress.

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations x. GHMC has to undertake projects for remediation of contamination in ground water and surface water bodies (ponds) in and around the HIMSWM Project. - In this regard, Detailed Project Report be prepared engaging an expert agency, by detailing out extent of contamination of Ground water as well as the surface water bodies in and around the HIMSWM Project and identification of remediation technics based on techno-economical feasibility and receptor's health risk considerations for the site followed by execution of the same. - The said remediation project be carried out under the supervision of Telangana SPCB through a Technical Expert Committee and be monitored by Department of Environment, Govt. of Telangana.	CPCB is requested to kindly direct the TGPCB to conduct the study review the data and present the facts since the analysis is based on last 6 months data while this site existing since last 20 year

1. Disposal of scientifically stored RDF

A. Issues which led to storage of RDF:

- Approval of establishing the envisaged 48 MW capacity WTE not accorded in 2012.
- Limited off take from cement plants.

B. Present Scenario / Progress:

- 24 MW WTE operational from Aug 2020 at Jawaharnagar and 14.5 MW WTE operational since March' 2024 at Dundigal consuming about **2000 TPD** of RDF as fuel.
- The RDF off take by cement plants has increased from **6 TPD** during 2012- 2015 to **340 TPD** presently to (09) cement plants mentioned below.

ACC	Orient	Ultratech
Ambuja	JSW	Maha cement
HWMP- Haz	India Cements	Green caron

- A 1000 TPD RDF manufacturing facility has been set up to further increase off take by cement plants by value addition to RDF. An MoU has been entered with “My Home Cements” for utilization of this RDF.

C. Future course:

- Proposed to set up (05) more RDF manufacturing units of 1000 TPD capacity each at alternate processing sites within next (05) years to channelize for coprocessing in (33) cement plants present within 300 km distance from GHMC.
- Additional WTE plants of cumulative capacity of 49 MW shall be established. (Jawaharnagar Phase II (24MW), Bibinagar RDF plant (11 MW), SVGPPL project Yacharam (14MW))

Future Action plan

Page No. 138

S.No	Cement Company Name	Plant	State	Kms	Fuel TPD
1	Penna Cement Industries Ltd- Tandur	Tandur	Telangana	136	500
2	Cement Corporation of India Ltd	Tandur	Telangana	140	500
3	The India Cements Ltd- Visaka Cement	Tandur	Telangana	152	500
4	Cement Corporation of India Ltd	Kurkunta	Karnataka	182	500
5	Penna Cement Industries Ltd- Ganeshpahad	Ganeshpahad	Telangana	182	500
6	Kesoram Cement- Vasavadatta	Sedam	Karnataka	183	500
7	Deccan Cement Ltd	Janpahad	Telangana	185	500
8	The India Cements Ltd- Raasi Cement	Wadapally	Telangana	185	700
9	Bhavya Cement Private Ltd	Dachepally	Andhra Pradesh	193	1000
10	Jaypee Cement- Durga Cement Works	Dachepalli	Andhra Pradesh	193	1000
11	The K.C.P. Ltd.- Macherla	Macherla	Andhra Pradesh	194	1000
12	Kesoram Cement- Basant Nagar	Basant Nagar	Telangana	197	1000
13	UltraTech- Rajashree Cement Works	Malkhed	Karnataka	200	1000
14	MPL Cement and Sponge Pvt Ltd	Redlakunta	Telangana	200	500
15	Sagar Cements Ltd	Mattam Palli	Telangana	206	500
16	Hemadri Cement Ltd	Jaggayyapet	Andhra Pradesh	208	500
17	My Home Industries Pvt Ltd	Mella Chervu	Telangana	210	2000
18	Rain Cements Ltd	Mellacheruvu	Telangana	210	1000
19	NCL Industries Ltd (Simhapuri Cement Plant)	Mattapalli	Telangana	212	500
20	Sri Chakra Cements Ltd	Karempudi	Andhra Pradesh	217	500
21	The K.C.P. Ltd- Muktyala	Mukteswarapuram	Andhra Pradesh	219	500
22	ACC Limited - New Wadi Cement Works	Wadi	Karnataka	219	500
23	Anjani Portland Cement Ltd	Chinthala Palem	Telangana	221	500
24	Madras Cements Ltd- Jayanthipuram	Jayanthipuram	Andhra Pradesh	224	500
25	Mancherial Cement Ltd	Mancherial	Andhra Pradesh	234	500
26	Mancherial Cement Ltd	Mancherial	Telangana	234	500
27	Kalaburgi Cement Pvt Ltd	Kalaburgi	Telangana	247	500
28	Chettinad Cement	Kallur	Karnataka	251	500
29	Kakatiya Cement & Sugar Industries Ltd	Peruvancha	Telangana	258	500
30	Orient Cement- Devapur	Devapur	Telangana	260	500
31	Kakatiya Cement & Sugar Industries Ltd	Peruvancha	Telangana	262	500
32	Zuari Cement Ltd.- Sri Vishnu Cement	Guntur	Andhra Pradesh	280	500
33	Cement Corporation of India Ltd - Adilabad	Tirupally	Telangana	300	500
Total					21200

2. Alternate MSW Processing facilities

- (02) alternate sites have been realized at Pyaranagar (150 acres) and Dundigal (85 acres). Action plan:
 - ❖ MSW Processing facility of 2000 TPD capacity at Dundigal within (01) year's time.
 - ❖ MSW Processing facility of 2000 TPD capacity at Pyara Nagar within (01) year's time. Subsequently, the capacity of the plant shall be enhanced to 4000 TPD .
- (02) additional alternate sites have also been identified :
 - ❖ Lakdaram -100 acres (sy no 747): Letter has been addressed to the concerned authority on 20.08.2024 to hand over advanced possession of 100 acres of land for setting up MSW Processing facility.
 - ❖ Malkapur – 200 acres (sy no 617): Letter has been addressed to the concerned authority on 22.05.2024 to identify and alienate about 200 acres of land for setting up MSW Processing facility.

Thank You



केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार.
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA.
Date: 2.09.2024

File No. CM-13013/19/2021-TECH-RD-CHENNAI-RD (Chennai)

To,

1. The Expert members
(As per list)

2. The Commissioner
Greater Hyderabad Municipal Corporation CC Complex,
Tank Bund Road, Lower Tank Band, Hyderabad, 500063

3. The Member Secretary
Telangana State Pollution Control Board
A-3, Paryavaran Bhavan, Sanath Nagar Rd,
Sanath Nagar Industrial Estate, Sanath Nagar,
Hyderabad, Telangana 500018

Subject: Minutes of the third meeting held on Aug 28, 2024 in O A No 199/2021 (SZ) in the matter of Sri Shankar Narayana Bala Krishna Telangana and Ors. Vs State of Telangana Rep by its Chief Secretary Hyderabad and Ors.

Sir,

This is in reference to the third meeting of expert group under the chairmanship of Chairman, CPCB held on 28th August 2024 at 10:00 AM through VC on above captioned subject.

The minutes of the meeting is enclosed herewith for kind perusal and necessary action in the matter.

Yours faithfully,


(Divya Sinha)
Director & DH, UPC-II, CPCB

Encl.: As above

Copy to:

1. PS to CCB: For Kind information, Please.
2. PS to MS: For Kind information, Please.
3. Regional Director, CPCB RD Chennai: For Information, Please
4. DH, Law Div.: For information, Please.


(Divya Sinha)

‘परिवेश भवन’ पूर्वी अर्जुन नगर, दिल्ली - 110032.
Parivesh Bhawan, East Arjun Nagar, Delhi - 110 032.

दूरभाष /Tel : 43102030, 22305792, वेबसाइट/Website: www.cpcb.nic.in



Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar, Delhi-110032

Minutes of the meeting held on Aug 28, 2024 in O A No 199/2021 (SZ) & I A No 96/2022 (SZ) in the matter of Sri Shankar Narayana Bala Krishna Telangana and Ors. Vs State of Telangana Rep by its Chief Secretary Hyderabad and Ors.

Hon'ble NGT (SZ) vide order dated 15/07/2024 in the matter of OA No. 199/2021, had directed that Chairperson of the CPCB shall convene a meeting with the concerned Experts constituted by the head of the CPCB along with the GHMC officials and come up with the appropriate solutions on the matter.

In compliance with the above direction, CPCB convened a meeting on August 28, 2024 via video conferencing, under the chairmanship of Chairman, CPCB, with the Experts group. Representatives from the Greater Hyderabad Municipal Corporation (GHMC), Telangana State Pollution Control Board and officials from the CPCB participated in the meeting. The list of participants is attached as **Annexure I**.

The Member Secretary, CPCB, briefly highlighted the issues related the matter and informed that two meetings had been held under his chairmanship on 23.08.2024 & 27.08.2024, during which various gaps observed and remedial measures to be taken at Jawahar Nagar site were deliberated upon. He further suggested GHMC to prepare a comprehensive action plan addressing the issues raised in CPCB report dated 14.07.2024.

Subsequently, CPCB made a detailed presentation highlighting the directions issued by Hon'ble NGT & salient features of the report submitted by CPCB in compliance with these directions. The presentation made by CPCB is attached as **Annexure II**.

CPCB observed that that capping of the dumpsite had not been successful resulting in the generation of a significant amount of leachate and the contamination of ground and surface water, even three years after the capping has been completed. The contamination of groundwater underneath the dumpsite (which could not be monitored) is expected to be much higher. Additionally, owing to the high moisture content and biodegradable nature of the capped waste, the waste is expected to react and reduce in volume in future and hence there is potential hazard related to subsidence of the capped site. It was further suggested to GHMC that phase-wise biomining should be carried out to treat the capped waste by isolating the site

GHMC made a presentation covering the existing facilities for the treatment of solid waste at the Jawahar Nagar site, which mainly included composting, co-processing at cement plants, the Waste-to-Energy (WtE) plant, new prospective sites identified for processing and disposal of solid waste, and the proposed plan for the disposal of stored RDF. The presentation made by GHMC is attached as **Annexure-III**.

CPCB observed that the core issues related to the remediation of the capped waste had not been addressed and only peripheral issues, such as the management of RDF/semi-processed waste, details of present solid waste management facilities & prospective sites etc., had been covered in the action plan.

It was recommended that the following four components should be covered in the Action Plan:

- i. Address the gaps in solid waste management processing capacity in the catchment area of the Jawahar Nagar dumpsite
- ii. Remediation of the capped waste
- iii. Disposal of stored semi-processed waste/RDF stored at the site
- iv. Remediation of groundwater & surface water.

It was further suggested that GHMC may contact IIT Roorkee for necessary assistance and guidance on the implementation of the aforementioned points

Sh. Asad Warsi, Director of Eco Pro Environmental Services, opined that biomining should be undertaken. He also highlighted the potential for a significant amount of leachate generation from the capped site, which could further contaminate surface and groundwater. Another expert, Sh. P.U. Asnani, suggested that GHMC come up with a complete blueprint for solid waste management. Furthermore, experts from NIH, NGRI, and CGWB endorsed that GHMC may contact IIT Roorkee (Dept. of Civil Engineering), which has expertise in the field, for the treatment of the capped area, biomining, and remediation purposes. The experts also offered to extend their expertise to GHMC as and when required. It was informed that CPCB shall also provide its support and guidance wherever it is required by GHMC.

Following this, the GHMC representative informed that permission to cap the dumpsite was included in the Environmental Clearance (EC) issued to GHMC from the State Level Environment Impact Assessment Authority (SEIAA) of Andhra Pradesh, MoEF & CC, on 20.06.2012, which was as per the provisions of the then-existing MSW Rules, 2000

Based on deliberations held, following action points were decided:

1. GHMC, Telangana SPCB & CPCB RD Chennai to jointly confirm the data included in the CPCB Report submitted to Hon'ble NGT in July 2024.
2. GHMC to prepare comprehensive action plan addressing the key issues listed at Point I to iv above.
3. GHMC may engage IIT Roorkee for remediation of the capped dumpsite
4. Representatives from the three organizations – NIH, CGWB & NGRI shall assist GHMC in assessing the impact of capped dumpsite on waste on soil and Ground water and remediation of the same.

The meeting ended with vote of thanks to the Chair.

List of participants.

SN	Name of Experts	Designation	Organization
1.	Sh. Tanmay Kumar	Chairman	Central Pollution Control Board
2.	Sh. Bharat Kumar Sharma	Member Secretary	Central Pollution Control Board
3.	Mrs. Divya Sinha	Director & DH, UPC-II	Central Pollution Control Board
4.	Mrs. H.D. Varalaxmi	Regional Director	RD Chennai, Central Pollution Control Board
5.	Dr. Y.R.S. Rao	Scientist 'G'	National Institute Hydrology (NIH) Roorkee
6.	Dr. Suresh Kumar	Assist. Chemist	Central Ground Water Board (CGWB)
7.	Dr. M.J. Nandan	Chief Scientist	National Geo Physical Research Institute (NGRI) , Hyderabad
8.	Ms. K. Sravanthi Jeevan	Assistant Adviser	Ministry of Housing and Urban Affairs
9.	Dr. M.P. Patil	Chief Scientist	CSIR - NEERI,
10.	Dr. P U Asnani,	Chairman	UMC, Global
11.	Sh. Asad Warsi	Director	Eco Pro Environmental Services
12.	Mr. Gajanan Kamat	Assistant Manager	Goa Waste Management Corporation
13.	Mrs. Nigam Agarwal	Director	Dept. of Environment, GNCTD
14.	Ms. Rani V.R.	Scientist 'D'	Central Ground Water Board (CGWB)
15.	Ms. Amrapalli Kata	Municipal Commissioner	Greater Hyderabad Municipal Corporation
16.	Sh. Koteswar Rao	Chief Executive Engineer	Greater Hyderabad Municipal Corporation
17.	Sh. Srinivasa Reddy	Executive Engineer	Greater Hyderabad Municipal Corporation
18.	Mrs. Srujana Shree	SEE	Telangana State Pollution Control board
19.	Sh. Narendra	SEE	Telangana State Pollution Control board
20.	Sh. Rajendra	SEE	Telangana State Pollution Control board
21.	Mrs. Poornima B.M.	Scientist 'D'	RD, Chennai, Central Pollution control Board
22.	Mrs. Suniti Parashar	Scientist 'C'	Central Pollution Control Board
23.	Sh. Madnesh Kumar Dubey	Scientist 'B'	Central Pollution Control Board
24.	Sh. Amit Kumar	Scientist 'B'	Central Pollution Control Board

Review Meeting in NGT Matter OA 199/ 2021



August 28, 2024

Background

NGT Order dated 29.9.22 in OA No. No. 606 of 2018

- ✓ **12 Million Tonnes Legacy capped at Jawaharnagar dumpsite by GHMC**
- ✓ **As per SWM Rules potential of bio-mining had to be first explored before resorting to capping, which has not been done.**
- ✓ **As per previous NGT Orders, such capping is not permissible.**
- ✓ **CPCB to examine this aspect in consultation with the concerned Experts and determine whether capping can be retained and if not what further course of action is to be taken for protection of environment.**

Background (Contd.)

- ❑ Previously, Hon'ble NGT in its order dated 14.2.2020 had directed GHMC for bio-mining of the dumpsite. Another Order of Hon'ble NGT dated 18.2.21 has observed that it is not shown to be factually correct that when capping was done, it was legally permissible and had dismissed the review petition. The matter has been twice reviewed and dismissed by the Hon'ble Supreme Court.
- ❑ First phase of soil cover was completed in 2014. Remaining capping activities (Phase 2 Soil cover, Leachate collection system , gas collection system etc.) were done by GHMC during 2018-2021 despite the Hon'ble NGT and Hon'ble Supreme Court Orders issued during this period.
- ❑ CPCB Guidelines recommending bio-mining as preferred option was issued and Hon'ble NGT has passed general orders in the year 2019 making bio mining as compulsory for remediating legacy solid waste dumpsites.

Action taken by CPCB :

Expert Group constituted & field visit conducted by the Experts. Major observations included:

Leachate Management System

- ✓ **12 Million Tonnes accumulated in an area of 339 acres of land was capped in 125 acres and around 214 acres of land was reclaimed**
- ✓ **Reclaimed land of 214 acres is utilized for installation and operation of integrated solid waste management facilities**
- ✓ **125 acres of land to which the waste has been shifted is unlined, as a result of which the ground water /surface water bodies in and around the area are exposed to hazard of contamination with the leachate generated from the dumpsite**
- ✓ **Leachate Collection System (LCS) has been installed for collection of leachate generated at the periphery through perforated pipes**

Leachate Management System (Contd.)

- ✓ **LCS contains five common collection tanks. Each of these tanks has the dimension of 1.6x1.6x2 m³**
- ✓ **Leachate treatment plant based of RO, MEE , Agitated Thin Film Drier (ATFD) & Mechanical Vapour Recompression Evaporation (MVRE) has been provided**
- ✓ **Generation of leachate from the capped dumpsite was observed which was flowing to the garland drain for collection of storm water.**
- ✓ **The capped waste area does not have a bottom liner and only peripheral leachate can be collected. The leachate percolating underneath the dumpsite contaminates ground and surface water.**
- ✓ **It is observed that although the leachate treatment system has been provided, leachate collection system in itself is not adequate.**

:

Ground Water Quality

- ✓ High levels of COD & TDS has been reported in the bore well samples which In some cases is > 5000 mg/l. & 12000 mg/L respectively
- ✓ Concentration of COD & TDS reported from ground water monitoring stations within the premises is much higher than that reported from stations located outside the premises, indicating groundwater contamination through the leachate.
- ✓ COD has been reported in ground water outside the premises, indicating the contamination of groundwater outside the premises also.

(c) Compressed Biogas Plant

- ✓ CBG capacity of 750 m³/d installed.
- ✓ Three flares for management of excess landfill gases.
- ✓ 152 nos. of gas collection wells provided.

Salient Observations in IIT Bombay Report

Page No. 152

- ✓ IIT Mumbai has conducted a project titled “Studies on Suitability of Decomposed Municipal Solid Waste for Bio-mining at Jawahar Nagar Capped Dumpsite, Hyderabad”.
- ✓ The study has been awarded to IIT Mumbai by GHMC.
- ✓ Moisture content in capped waste ~ 30-60% which is comparable to fresh waste
- ✓ Organic matter (OM) average value of ~20% suggesting waste is prone to further decomposition
- ✓ Based on Multichannel Analysis of Surface Waves (MASW) , there exists presence of high amount of undecomposed solid waste in the capped area.
- ✓ Further, based on the Electrical Resistivity Tomography Test there is a presence of saturated municipal solid waste, which is prone to decompose in due course of time.
- ✓ High concentration of sulphur, Total Organic Carbon and Total Nitrogen reported in the leachate analysis
- ✓ It is expected that the process of decomposition and leachate generation will continue for extended period
- ✓ Average calorific value of the coarse fraction is 2967KCal/Kg
- ✓ High Ash content ~ 38 % reported in coarse fraction

Conclusions of the IITB Report

- ♣ MASW (Multichannel Analysis of Surface Waves) results indicate the presence of saturated and loosely compacted MSW up to greater depths, which confirms the presence of yet to stabilize MSW. Further, Electrical Resistivity Tomography results also indicate that MSW is yet-to-decompose.
- ♣ The waste under capping is actively decomposing hence the bio-mining of JLH at this point in time is not recommended.
- ♣ Despite having desired calorific value of >1500 kCal/kg, the coarse fraction of MSW has ash content of 60% hence these fractions unsuitable as refuse-derived fuel.
- ♣ Based on the present state of the decomposed MSW and foam observed during borehole drilling, it can be concluded that the waste is yet to decompose. Hence, the JLH is not ready for bio-mining.

CPCB's observations on the report of IIT Bombay;

- a. CPCB in its Guidelines issued in 2019 has recommended bio mining as preferred option as the waste is unstable and leachate is likely to be generated**
- b. The bio-mining process using bio-cultures can stabilize the waste**
- c. As per CPCB Guidelines for legacy waste management, risk assessment and an onsite emergency plan should be conducted prior to commencement of dumpsite bio-remediation to counter any fire-hazards during bio-remediation**
- d. The ash content of RDF can be brought down though pre-processing of RDF**

Proposal of CPCB for Further Action (Report filed by CPCB in September 2023) :

It is observed that substantial investment has been made to cap or cover about 125 acres of open dumpsite to get the benefits of bio-gas capturing, containing leachate during rainy seasons, controlling odour and to improve aesthetics with green cover on top, however the selected option does not yield the desired environmental benefits compared to bio-mining as per CPCB guidelines and the Orders passed by Hon'ble NGT since the sites expected to contaminate the groundwater and area under landfill may remain an environmental liability for the future. Hence the options of gradual conversion of capped area and the stabilized waste underneath may be bio-mined gradually, without effecting the functions of capped area immediately. This shall require a detailed project report address the following aspects;

Proposal of CPCB for Further Action (Contd.)

- The environmental and economic benefits of the investment already made.
- The net damage (Soil, surface & Ground water) that may continue to occur during the capping period, including the time period for which leachate is expected to be generated
- Detailed hydrogeological study to assess the impact of leachate generation on the surface/ground water bodies
- Requirement of remediating contaminated ground water even after initiating the biomining
- Detailed assessment of the IIT Mumbai Report

Hon'ble NGT Directions to CPCB dated 1.2.24

- **Para 5 : CPCB to direct the GHMC or the State Pollution Control Board to construct additional collection wells of the leachate for the purpose of treatment which would avoid contamination of downstream water bodies.**
- **Para 6: CPCB had given its observation on the report of the IIT Bombay. Of the 10 Experts engaged by the CPCB to prepare a report, comments had been received only from 5 Experts and the others' reports are awaited. The experts' opinion in this regard is awaited to address the following aspects namely, (i) Environmental and economic benefits of the investment already made, (ii) Net damage (soil, surface & groundwater) that may continue to occur during the capping period, including the time period for which leachate is expected to be generated, (iii) Hydro-geological study to assess the impact of leachate generated on the surface/groundwater bodies and (iv) a detailed assessment of observation made in the report of the IIT Bombay.**
- **Para 11 CPCB to prepare a technical report for remediation of lakes which have been contaminated with leachate**

- In compliance to Para 5 of the NGT Directions, Letter issued to Telangana SPCB by CPCB, which issued appropriate Directions to GHMC . GHMC has informed that the collection system has been approved by EPTRI
- CPCB held a Meeting with the Experts to deliberate upon Para 6 of the NGT Directions, During discussion it was pointed out from the members that environmental and economic benefits of the investment cannot be directly estimated as it requires times series data with respect to ground water, air, soil, odour and water at the site and its surroundings. Hence it was recommended by expert members that TSPCB shall identify suitable agencies/institutions to carry out a comprehensive study to address the above mentioned points directed by Hon'ble NGT.

CPCB Report dated 1.4.24 (Contd.)

- **Para 11: CPCB has previously submitted a report entitled “Alternative Treatment Technologies for wastewater treatment in Drains” during the year 2020 to NGT in another NGT matter. The report was prepared in consultation with expert organizations. CPCB convened a meeting with these Experts on March 01, 2024 (National Environmental Engineering Research Institute (NEERI), Hyderabad Zonal Centre, Institute of Chemical Technology (ICT), Mumbai and Centre for Environment Management of Degraded Ecosystems (CEMDE), University of Delhi). Based on their inputs, technical report on the remediation of the downstream water bodies contaminated with leachate near Jawahar Nagar was prepared and submitted to NGT**

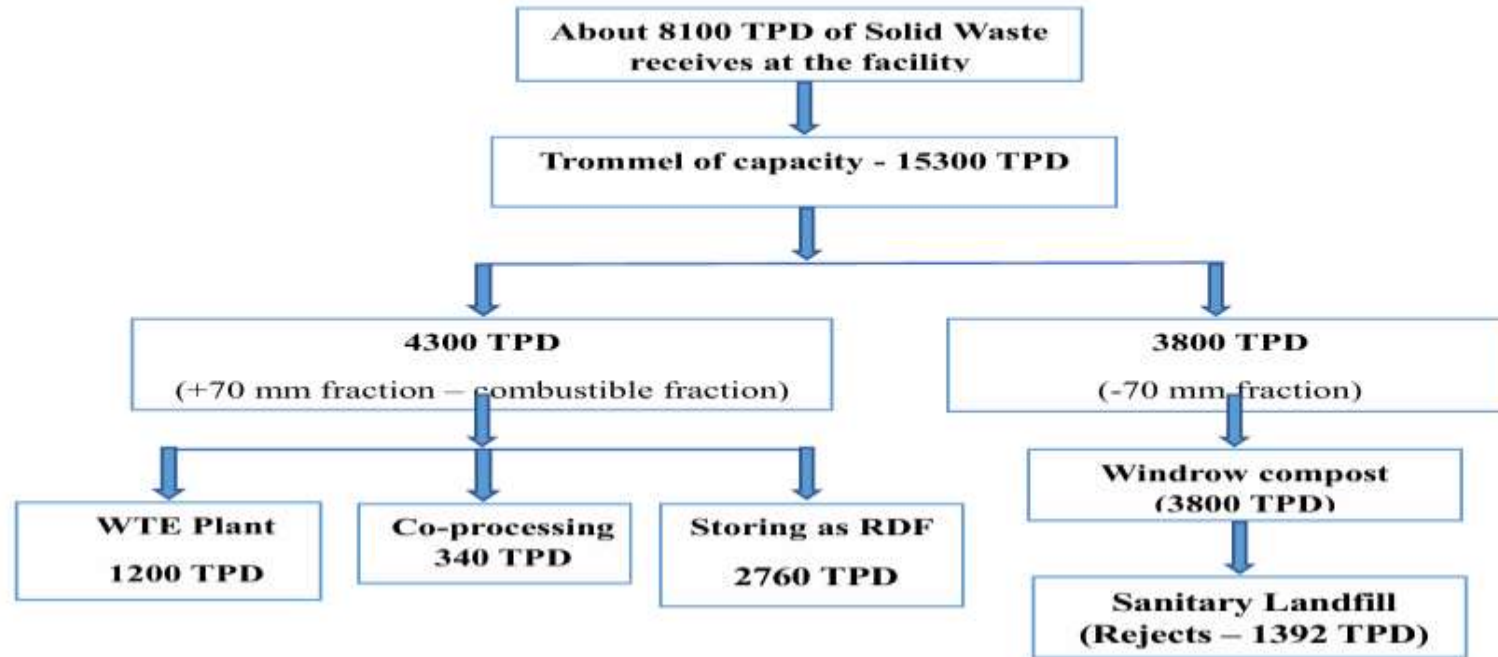
NGT Order dated 29.4.24

Para 6: Therefore, we direct the CPCB to do the required study in the interest of the nation to address the issue of leachate from the dumping yards in various states to come out with an appropriate guideline and also issue appropriate directions to the SPCBs, in particular to the Telangana SPCB with regard to the case in hand.”

CPCB filed Report on July 14, 2024

(a) Joint inspection of GHMC site with SPCB & GHMC officials

Flow diagram for treatment of solid waste generation of 8100 TPD



- ❑ The total utilization of RDF per day at present is about 1540 TPD and remaining 2760 TPD is stored in temporary covered dumps
- ❑ An active storage of semi-processed solid waste has taken place between the capped sites and also above the capped areas.. At present 68,17,487 MT of un-utilized semi processed waste is stored in the processing facility.
- ❑ 3100 TPD of -70 mm fraction is processed in the Compost plant. However, the compost plant processing capacity is only 2000 TPD. Hence, the remaining 1800 TPD of -70mm fraction is stored in HIMSWM Project
- ❑ In view of above, only 3540 TPD (43.7%) of the total received waste 8100 TPD is fully utilized and the remaining 4560 TPD (56.3%) of semi processed waste (2760 TPD of +70 mm fraction and 1800 TPD of -70 mm fraction) accumulates in the HIMSWM Project premises.
- ❑ Additionally, 1390 TPD of rejects is generated during processing of 2000 TPD of -70 mm fraction in the composting facility which is disposed of the Sanitary landfill (SLF) located in HIMSWM Project The SLF can be utilized for disposal of waste for only next six months as per the available capacity of the SLF. It is observed that the entire area of Jawaharnagar waste processing has been utilized and scope for expansion is limited.

Three distinct streams of leachate generation from the site

(a) Seepage collected along the periphery of the old capped area as well as percolation of leachate to the Groundwater from the solid waste dump

(b) Semi-processed waste being stored in a lined area

(c) Fresh waste being dried for a period of ten days in the composting plant area, prior to trommelling on an unlined area

Malkaram pond is contaminated due to leachate from dumpsite which enter the pond both from surface as well as through underground seepage.

Leachate collection system

(a)Capped dumpsite: GHMC has constructed five (05) leachate collection ponds (LCPs) for collecting the leachate generated from the capped site and additional two ponds were constructed with a storage capacity of 35300 KL.

There is no provision to collect leachate which is percolating down to the groundwater through the unlined base of the dumpsite.

(b) Semi-processed waste is being stored in a lined area. The leachate is being collected through surface drainage system.

© Fresh waste is being dried for a period of ten days in the composting plant area, prior to trommelling on an unlined area. This area is, however, not lined and there is no proper provision for collection of leachate from this area.

Leachate Treatment System

- (a) Low Temperature Mechanical Vapour Recompression (MVR) technology of 02MLD for legacy leachate**
- (b) RO + MEE (1 MLD) for fresh leachate**

The RO reject is presently stored in two lined ponds and one unlined pond posing a risk of seepage /groundwater contamination. There is also a risk of overflow from storage ponds in case of heavy rains.

- ☐ The groundwater of all monitoring bore wells (S. No. 7 to 11) are contaminated with respect to TDS & COD. Elevated levels of COD indicate that there is intrusion of leachate into the groundwater
- ☐ The bore well sample collected from the dairy farm adjacent to artificial ponds created for storing legacy leachates also shows higher concentration of TDS & COD. It was informed by owner of the farm that the bore well water is not used from past 06 years due to contamination.
- ☐ TSPCB collects the samples from monitoring wells & surface water bodies every month. The data/trend indicates that values of TDS & COD at monitoring wells is showing an increase in concentration since February, 2024 w.r.t COD, and concentration of TDS is increased from April, 2024 at monitoring well no. 1, similar trend noticed in well no. 5, w.r.t. COD concentration.
- ☐ The MEE condensate from the Leachate treatment plant of 01 MLD capacity, shows high concentration of COD, indicating that the treatment system is not efficient.
- ☐ The MVR Condensate is to be discharged to inland surface water bodies as per the Consent issued by TSPCB. The analysis data shows that the MVR is meeting the norms for discharge into inland water bodies as per Schedule II B of SWM Rules for two monitored parameters -namely COD & TDS. It is, however, exceeding the norms stipulated for pH.

Recommendations

- ❑ GHMC has identified three sites at Pyaranagar, Lakdaram and Khanapur for processing solid waste generated from GHMC area and to minimize the load on Jawaharnagar facility. Even after 07 years, the other processing facilities have not been made operational. GHMC may either develop these sites on priority, and manage the fresh waste in these facilities instead of accumulating it in HIMSWM Project or develop additional processing/utilization capacity at HIMSWM Project.
- ❑ GHMC to operationalize the WTE Plant being set up in HIMSWM Project and also identify additional avenues for processing of RDF accumulated (68.17 lac T) on its premises. Further, the other accumulated semi-processed waste in HIMSWM Project also needs to be processed/utilized on priority.
- ❑ Thereafter, the capped site is to be opened gradually in phase wise planned manner for biomining.
- ❑ Conditions for discharge of MEE condensate have not been stipulated in the Consent issued by TSPCB.
- ❑ GHMC shall also immediately conduct efficacy assessment of the leachate treatment system and improve its performance.

Recommendations (Contd.)

- ☐ The land-fill gas collection system may continue to operate till the time the capped cells are opened for bio-mining. It is observed that only 14% of the gas generated is utilized, while the remaining is flared. Efforts to be put to increase utilization of the gas and flaring of landfill gases shall be minimized by increasing the capacity of gas processing plant. The operator of Integrated Municipal Solid Waste Management Project shall explore the option of utilizing lean landfill gases for possible energy recovery through Waste to Energy Plants.
- ☐ GHMC shall ensure that the drying of fresh waste is done on a lined area and with proper arrangement for collection of leachate from this sections and its conveyance to the leachate treatment plant.
- ☐ TSPCB has to assess the characteristics of the residue which is generated from MEE as well as the MVR to confirm whether or not, it is hazardous waste. It is to be disposed of as per provisions of HWM Rules 2016, if found to be hazardous waste.

Recommendations (Contd.)

- ❑ There has been active contamination of groundwater & surface water bodies around the GHMC facility In this regard, GHMC shall achieve effective management of leachate as well as reduction in contamination level of groundwater during and after the bio-mining of the site by implementing the following measures;
 - ✓ Temporarily covering the freshly dumped waste till the accumulated waste is processed at the facility
 - ✓ Lining of the area used for drying of waste and making proper arrangement for collection of leachate from this sections and its conveyance to the leachate treatment plant should be made.
 - ✓ Empty the unlined leachate storage pond (1 nos.) after treating the accumulated leachate.
 - ✓ No artificial storage or guard ponds shall be operated without an impervious bottom and side liners (preferably of 1.5mm thick HDPE liner).
 - ✓ Adequate measures, including construction of additional storage ponds, if required, to be taken up to prevent overflow from the leachate storage ponds considering monsoon season
 - ✓ GHMC has to undertake projects for remediation of contamination in ground water and surface water bodies (ponds) in and around the HIMSWM Project.
- ❑ Hon'ble NGT may grant three months time to CPCB for preparation of comprehensive guidelines for leachate management at the dumpsites.

- **Para 6:** The CPCB has stated that the GHMC shall achieve effective management of leachate as well as a reduction in contamination level of groundwater during and after the biomining of the site by temporarily covering the freshly dumped waste till the accumulated waste is processed at the facility.
- **Para 7 .** Neither the GHMC should be allowed to dump it on the already capped site nor the CPCB allow them to temporarily cover the freshly dumped waste. This will lead to nowhere, as it will be creating another capped site.
- **Para 8.** When already the CPCB as well as the GHMC is finding it difficult to remove the capped waste, further capping should not be permitted. If GHMC is doing it by itself, it is Control Board to step in to stop the same.
- **Para 9:** Despite the fact that this Tribunal has been following this matter from 2021 and though the various departments have engaged experts in this regard, so far no conclusion could be arrived at. The capped area itself is said to be more than 125 Acres, which is a fairly large area and the leachates from the area would be hazardous if it is not being treated scientifically.
- **Para 10.** It is high time for the GHMC and CPCB to stop the blame game, find an appropriate solution in a time-bound manner and treat the capped area.

ACTION TAKEN BY CPCB

- ☐ Additional members included in the Expert Group – NIH, CGWB & NGRI
- ☐ Two Meetings of the Expert Group convened on August 24 & 27, 2024
- ☐ Representative of GHMC made certain observations on data related to processing/ capacity on Solid Waste Management facilities included in the recent report submitted to Hon'ble NGT by CPCB.
- ☐ Dr. Suresh Kumar from CGWB informed that, according to a study conducted during 2012 around Jawahar Nagar site, there was a high concentration of some parameters such as TDS, TOC, sodium and fluoride in both surface water and groundwater.
- ☐ The new members of the expert group requested additional time to properly understand the matter and provide their valuable inputs in the next meeting. Based on deliberations held, following actions were decided

- 1.0 CPCB to share the relevant documents related to the matter including latest NGT directions, CPCB reports filed in compliance to the Hon'ble Directions with the Expert members including representative from NGRI, NIH and CGWB. (Action: CPCB)**
- 2. Greater Hyderabad Municipal Corporation to prepare and make presentation on action plan with time line before the expert group on next meeting covering proposed holistic solutions and management of RDF generated on daily basis, RDF already lying on the site & semi-processed/fresh waste lying on the site in consultation with Telangana State Pollution Control Board. (Action: GHMC & TSPCB)**
- 3. CGWB to share the reports of Surface Water & Ground Water conducted during 2012 as informed during meeting (Action: CGWB)**
- 4. GHMC to communicate CPCB their observations on data related to processing/ capacity on Solid Waste Management facilities mentioned in the recent report submitted to Hon'ble NGT by CPCB. CPCB and Telengana SPCB may jointly examine such observations on data. (Action: GHMC)**

Key issues discussed during the second meeting held on 27.8.24

- (a) GHMC presented the Action plan for managing fresh and stored RDF on its premises. However, it was observed that all issues raised in CPCB report had not been addressed. GHMC was informed to present a comprehensive Action Plan addressing the recommendations made in in the CPCB report**
- (b)Telangana SPCB could not comment on the observations related to processing capacity of the SWM facilities made by GHMC on the CPCB report. Telangana SPCB was requested to provide their comments on the same.**
- (c)It was informed by CGWB that a more comprehensive monitoring network would be required to assess the extent of impact of the dumpsite on the ground water**
- (d)It was further informed by the Committee members that assistance from three organizations – NIH, CGWB and NGRI would be required for remediation of contamination in ground water and surface water bodies (ponds) in and around the HIMSWM Project**

THANK YOU



GHMC Action Plan on CPCB Recommendations

CPCB Recommendations	GHMC Action Plan
• 2.2.1 i. M/s Hyderabad Integrated Municipal Solid Waste Management Project is the only facility to manage the entire solid waste generated from entire GHMC. The premises of the facility including the capped dumpsite, is spread over an area of 339 acres. The site receives about 8,100 Metric Ton (MT) of solid waste per day. ii. The M/s Hyderabad Integrated Municipal Solid Waste Management Project is operated by M/s Re Sustainability Ltd., on the behest of Greater Hyderabad Municipal Corporation (GHMC) since the year 2012. iii. After commencement of operation by M/s Re Sustainability Ltd., scattered and unscientific open dump of about 12 lakh MT of solid waste, spread across 313 acres of land was shifted to an area of 125 acres of land and about 214 acres of land was reclaimed for other solid waste management facilities. iv. As per information provided by GHMC, 8,100 TPD of solid waste generated from GHMC area and other urban local bodies (ULBs) is received at HIMSWM Project. The site comprises of the following features/operations; a. Capped landfill of size 125 acres b. Compost plants of capacity 3 x 680 TPD (~ 2000 TPD) c. Trommels capacity for solid waste processing – 19x35 TPH & 2x50 TPH with total capacity of 15300 TPD (as informed 20 hrs operation time) d. Waste segregation facility (called as RDF unit of 5000 TPD)	iii. ...unscientific open dump of about 120 Lakh Mt of solid waste iv. b. Compost plant of capacity 4,000 TPD (Note: i. as per Readiness Certificate issued by EPTRI, the I.E for the project. ii. This shall be validated by TGPCB Slide 2

CPCB Recommendations	GHMC Action Plan
2.2.1 iv. e. Land-fill gas collection system in capped area (155 bore-holes and flare stacks) – Gas handling, concentration and bottling unit of 750 KL of methane per day. f. Waste to Energy (WTE) Plant – 24 MW capacity; another unit of 24 MW capacity is under construction. g. Leachate collection and treatment systems (1nos- 01 MLD capacity) for 533 KL per day of leachate generation h. Plastic Waste recycling facility (capacity – 1000 TPD) i. Active dumping of semi-processed solid waste (un-utilized RDF) j. Sanitary landfill (27 acres) for rejects/inert materials	e. ...Gas handling, concentration and bottling unit of 5 MT of methane per day. f. Waste to Energy (WTE) Plant – 24 MW capacity; 14.5 MW capacity WTE commissioned in March 2024 at Dundigal. Another unit of 24 MW capacity is under construction.

- 2.2.1
- vi. The incoming waste to the facility is not segregated, thus unit receives mixed waste, which is passed through Trommels to separate larger fractions (+70 mm) (4300 TPD) of solid waste called as RDF. **A fraction of said RDF or semi-processed solid waste is being utilized in 24 MW capacity WTE Plant (about 1200 TPD) for electricity generation and 340 TPD of RDF is being sent to cement industry. Hence, the total utilization of RDF per day at present is about 1540 TPD and remaining 2760 TPD is stored in temporary covered dumps within the premises.**
- vii. It is observed that excess (un-utilizable) semi-processed solid-waste was initially stored at one identified location within the premises, which is 11 lakh MT stored in 61 acres of land near to RDF processing facility, located in west direction of processing plant and a total height of this is about 60m. It was observed that an active storage of semi-processed solid waste has taken place between the capped sites and also above the capped areas. It was also observed that a temporary cap of 1.5mm HDPE sheet is laid over the levelled mounds of solid waste. At present 68,17,487 MT of un-utilized semi processed waste is stored in the processing facility.
- viii. Accumulated semi-processed waste (RDF) in last 12 years is given in below Table 1:

vi. A fraction of said RDF or semi-processed solid waste is being utilized in 24 MW capacity WTE Plant (about 1200 TPD) **& 14.5 MW capacity WTE Plant (about 800 TPD)** for electricity generation and 340 TPD of RDF is being sent to cement industry. Hence, the total utilization of RDF per day at present is about **2340 TPD and remaining 1960 TPD** is stored in temporary covered dumps within the premises.

The data in the above table is clearly indicating inadequacy of solid waste treatment facility to process the entire quantity of waste being disposed at the said site.

CPCB Recommendations	GHMC Action Plan
2.2.1 Viii. The processing capacity of trommels is 15300 TPD, considering 20 hrs operation time. The existing trommels can hence process 8100 TPD of waste in 11-12 hrs. 4300 TPD of +70mm size fraction (Refused derived fuel (RDF)) and 3800 TPD of -70mm fraction is generated upon processing of 8100 TPD of mixed waste in the trommels. The HIMSWM Project has capacity to process 1200 TPD of RDF in the WTE Plant. Additional 340 of RDF is being sent to Cement industry. Accordingly, only 1540 of RDF is utilized, and the remaining 2760 TPD of RDF (+70 mm) is stored in the HIMSWM Project. Further, 3100 TPD of -70 mm fraction is processed in the Compost plant. However, the compost plant processing capacity is only 2000 TPD. Hence, the remaining 1800 TPD of -70mm fraction is stored in HIMSWM Project. In view of above, only 3540 TPD (43.7%) of the total received waste 8100 TPD is fully utilized and the remaining 4560 TPD (56.3%) of semi-processed waste (2760 TPD of +70 mm fraction and 1800 TPD of -70 mm fraction) accumulates in the HIMSWM Project premises. Additionally, 1390 TPD of rejects is generated during processing of 2000 TPD of -70 mm fraction in the composting facility which is disposed of the Sanitary landfill (SLF) located in HIMSWM Project.	...the compost plant processing capacity is 3800 TPD. Hence, ~~the remaining 1800 TPD of -70mm fraction is stored in HIMSWM Project.~~ In view of above, only 6140 TPD (75.8%) of the total received waste 8100 TPD is fully utilized and the remaining 1960 TPD (24.2%) of semiprocessed waste (+70 mm fraction only) accumulates in the HIMSWM Project premises. 1392 TPD of rejects is generated during processing of 3800 TPD of -70 mm fraction in the composting facility which is disposed of in the Sanitary landfill (SLF) located in HIMSWM Project.

CPCB Recommendations	GHMC Action Plan
2.2.1 ix. In the year 2012, a sanitary landfill was constructed in an area of about 13 acres which was closed in 2019. In the year 2020, another landfill was constructed in 27 acres of land at the south side of processing facility and which is presently in operation. Three cells were constructed, out of which two cells are closed and one cell is currently operational. About 1390 TPD of rejects/ inert material and residue generated from leachate treatment plants is disposed in the sanitary landfill. The SLF can be utilized for disposal of waste for only next six months as per the available capacity of the SLF	The residue generated from the legacy leachate treatment plant is being disposed in a sanitary landfill as per direction from TSPCB

CPCB Recommendations	GHMC Action Plan
2.2.1 ix. It is observed that the entire area of Jawaharnagar waste processing has been utilized and scope for expansion is limited. As explained in above paras, there is no additional storage space, and the semi-processed waste is being stored in spaces between capped sites and above the capped sites leading to additional quantity of leachate being generated from the dumpsite.	Action: The semi-processed waste being stored temporarily in spaces between capped sites and above the capped sites for want of preparation of lined storage area is now being shifted (in progresss)

4.0 Conclusions and Recommendations

i. The Hyderabad Integrated Solid Waste Management Project at Jawaharnagar is not adequate for processing/utilizing entire received waste (8100 TPD) from Hyderabad city. The facility can utilize about 43.70% of waste against the generation of 8100 TPD and the rest 56.3% (i.e. 4560 TPD) is being accumulated in the processing facility as semi-processed waste.

• The semi-processed waste is being dumped in the available spaces in the premises of facility, including the spaces between the capped cells and also above the capped cells causing additional leachate generation.

- Currently, the fresh municipal solid waste (MSW) received at Jawahar Nagar Site (JWNR) stands at about 8100 TPD from GHMC and surrounding 15 municipalities. GHMC is processing all the waste received.
- After pre-sorting, the segregated combustible fraction (SCF) constitutes around 53% of the waste, resulting in approximately 4300 metric tons per day of RDF generation.

Description	UOM	FY24	Remarks
Fresh MSW	MT	8100	
RDF Portion	MT	4300	
AvailableInfrastructure for disposal of RDF			
WtE-JWNR Phase 1	MT	1200	Operational
WtE-2 (Dundigal)	MT	800	Operational
SCF Co-processing Cement Industries	MT	340	
RDF Unit	MT	1000	Under Trial run
Under Construction Infrastructure for disposal of RDF			
WtE-JNW(Phase-2)	MT	1200	To be operational by Jan'25
Total	MT	4540	

- After processing fresh waste to the tune of about 8100 TPD, all the RDF recovered is being processed and nothing will be left for storage after commencement of WtE phase II.
- The semi-processed waste is stored in a lined cell with top cover in the space available adjacent to capped landfill with proper leachate collection system.

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations ii. In compliance to Hon’ble NGT order dated December 7, 2017 in OA No. 780 of 2017 in the matter of Peddi Mohan Reddy & Ors VS. State of Telangana, (PB) Delhi; GHMC has identified three sites at Pyaranagar, Lakdaram and Khanapur for processing solid waste generated from GHMC area and to minimize the load on Jawaharnagar facility. Even after 07 years, the other processing facilities have not been made operational. • GHMC may either develop these sites on priority, and manage the fresh waste in these facilities instead of accumulating it in HIMSWM Project or develop additional processing/utilization capacity at HIMSWM Project. GHMC to evaluate the same and take immediate actions in this regard. • Further, GHMC to operationalize the WTE Plant being set up in HIMSWM Project and also identify additional avenues for processing of RDF accumulated (68.17 lac T) on its premises.	• As the Jawahar Nagar facility is not adequate for future waste generation from the entire catchment, GHMC already identified 3 new sites for development of the processing & disposal facilities which are at various stages of approvals for establishment of new facilities. • As such, GHMC plans to limit the waste intake at Jawaharnagar to between 4000 - 5000 tons per day and reduce the same further in future. • Following locations are under consideration 1. Dundigal-85 acres, 2. Pyaranagar-150 Acres 3. Lakdaram-100 Acres, 4. Malkapur - 200 Acres • GHMC will ensure that processing of the waste at these sites shall commence within 12 to 24 months. • 24 MW WTE phase –II is slated for commissioning by Jan’25 which will consume anither 1200 MT of RDF • Additional avenues for EDF disposal: • we have identified around 33 (List enclosed) Cement Units within 300 Kms with a combined fuel requirement of 21,200 TPD. Considering 15% TSR, RDF requirement translates to 3200 TPD, • Support Required: CPCB/TGPCB has to facilitate necessary support/permissions from KSPCB, APPCB and MPPCB for the above offtake plan to materialize

4.0 Conclusions and Recommendations

iii. Further, the other accumulated semi-processed waste in HIMSWM Project also needs to be processed/utilized on priority. Thereafter, the capped site is to be opened gradually in phase wise planned manner for biomining.

Proposed plan for disposal of stored RDF:

- There are approximately 33 Cement Units within 300 Km with a combined fuel requirement of 21,200 TPD. Considering 15% TSR, the RDF requirement translates to 3200 TPD.
- Plan A : It is proposed to clear the stored RDF within **5 years** by setting up 5 (five) RDF units with processing capacity 1000 TPD each at appropriate locations. On average, these units will generate 3500 TPD of RDF from the stored material.
- Plan B: Consumption of RDF in the WTE.
- As per NGT Order Point 8 & 10
“ **CPCB as well as the GHMC is finding it difficult to remove the capped waste**”
“ **If the appropriate solution in a time bound manner and the capped area**”
- Further we request not to open the scientifically capped dumpsite

Support Required:

- Consistent offtake from Cement industries has been a major challenge due to varying usage of AFR and Coal price trends.
- CPCB/TGPCB has to facilitate necessary support/permissions from KSPCB, APPCB and MPPCB for the above offtake plan to materialize.

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations iv. The groundwater in an around the dumpsite is contaminated as per the analysis of ground water of all samples monitored during the inspection. Further, as per the monitoring carried out by TSPCB, increasing trend in concentration of COD & TDS has been observed in the groundwater collected from the said area, indicating contamination of the groundwater with leachate.	Page No. 186 • Analysis represent last 6 month data while the dumping gappened since past 20 years. CPCB shall direct the TSPCB to review the data and present the facts. • Jawahar Nagar facility is spread over 339 acres as an erstwhile open dumpsite, waste dumping started in 2001 from Alwal and Kapra Municipalities. • Starting from 2004, Jawahar Nagar dump site started receiving unsegregated MSW from all over Hyderabad. • Prior to the initiation of the reclamation works in 2012-13, the site functioned as a uncontrolled solid waste dumpsite. • Approximately 12 million metric tons of waste was present on the site at the time of handing over to the Concessionaire for reclamation. • This prolonged period of accumulation of mixed MSW over the site has led to contamination of surrounding water bodies and ground water. • Ground water sample in 2013-14 in the areas downstream of the legacy leachate ponds indicate an average COD level of 300-3642 mg/l and average TDS level from 4992-13968 mg/l, • Ground water sample collected from villages/settlement around year 2013-14 located downstream of the site indicated average TDS level from 910-6410 mg/l. • The above constitute the documented baseline of ground water quality in the area, attributable to historical open waste dumping practice. • The legacy waste was confined to a footprint of around 125 acres and scientifically capped, thereby 234 acres of land was reclaimed. • Ground water samples post completion of capping have shown significant decline in the downstream monitoring wells. TDS reduced to 1040-5713 mg/l from 4992-13968 mg/l, • Samples collected and tested from neighbouring villages also showed stabilization in the parameters. TDS level reduced to 575-940 mg/l. • Since 2018 GHMC is supplying drinking water to the nearby villages through Water Board connections as well as by water tankers to mitigate drinking water requirements Slide 11

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations v. The MEE condensate from the Leachate treatment plant of 01 MLD capacity, also shows high concentration of COD, indicating the inefficiency of the leachate treatment system. It is partly utilized in ash quenching of WTE plant, while the rest is disposed in natural storm water drain. • Conditions for discharge of MEE have not been stipulated in the Consent issued by TSPCB. TSPCB shall immediately prescribe standards for treated leachate and its utilization/discharge and GHMC shall also immediately conduct efficacy assessment of the leachate treatment system and improve its performance.	• GHMC has request to review the statement. We have already submitted a request letter for necessary correction to CPCB vide letter No.SWM/0049/2021-AE-2(SWM)-HO dated 24.8.2024. • However we wish to reiterate that the LTP Consist of three treatment unit, RO, followed by Multiple Effect Evaporator (MEE) followed by Agitated Thin Film Drier (ATFD) System. The RO permeate is used for green belt development, where as condensate from MEE is fully utilized in bottom ash quenching of WtE plant. • Above system is adequate to manage the fresh leachate generation from the facility.

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations vi. The land-fill gas collection system may continue to operate till the time the capped cells are opened for bio-mining. - It is observed that only 14% of the gas generated is utilized, while the remaining is flared. - Efforts to be put to increase utilization of the gas and flaring of landfill gases shall be minimized by increasing the capacity of gas processing plant. - The operator of Integrated Municipal Solid Waste Management Project shall explore the option of utilizing lean landfill gases for possible energy recovery through Waste to Energy Plants.	As per NGT order dated 15.7.2024, Point no: 8 &10 “CPCB as well as the GHMC is finding it difficult to remove the capped waste, further capping should not be permitted. If GHMC is doing it by itself, it is always open to the CPCB as well as the Telangana State Pollution Control Board to step in to stop the same. It is high time for the GHMC and CPCB to stop the blame game, find an appropriate solution in a time-bound manner and treat the capped area.” Action: Based on the recommendation we have explored the possible option. - The Gas engine of 1500 kva is commissioned at Jawaharnagar to utilize 350 cum per hour of purified gas (full capacity of existing CBG plant) to generate the power and the same is being utilized for RDF plant operations. - The Purified gas being supplied to isnapur biomedical incineration unit. - GHMC will ensure appropriate utilization of the entire gas from the capped dump either through GAIL for power generation for captive usage.

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations Vii Fresh waste is being dried for a period of ten days in the composting plant area, prior to trommelling on an unlined area. This area is however, not lined and there is no provision for collection of leachate from this area which has potential for contamination of both ground water as well as surface water bodies. GHMC shall ensure that the drying of waste is done on a lined area and with proper arrangement for collection of leachate from this sections and its conveyance to the leachate treatment plant.	- GHMC submitted the clarification to CPCB vide letter SWM/0049/2021-AE-2(SWM)-HO dated 24.8.2024. - The fresh waste is stored on the Tipping floor for 7 days before the composting plant, which is an SFRC (steel-fibered reinforced concrete) 170mm thick which is impermeable. The design is approved by IIT Madras. - The entire floor of the composting plant has the same floor with a 2% slope connected with the garland drain of RCC to collect the leachate and it is ultimately connected with the main leachate collection system. - GHMC is assuring all the working platforms in the Integrated facility are impermeable with prior approval of construction from an independent engineer.

CPCB Recommendations	GHMC Action Plan
4.0 Conclusions and Recommendations viii. TSPCB has to assess the characteristics of the residue which is generated from MEE as well as the MVR to confirm whether or not, it is hazardous waste. It is to be disposed of as per provisions of HWM Rules 2016, if found to be hazardous waste.	TGPCB may examine the same.

4.0 Conclusions and Recommendations

- ix. Temporarily covering the freshly dumped waste till the accumulated waste is processed at the facility
- Lining of the area used for drying of waste and making proper arrangement for collection of leachate from this sections and its conveyance to the leachate treatment plant should be made.
- Empty the unlined leachate storage pond (1 nos.) after treating the accumulated leachate. No artificial storage or guard ponds shall be operated without an impervious bottom and side liners (preferably of 1.5mm thick HDPE liner). Adequate measures, including construction of additional storage ponds, if required, to be taken up to prevent overflow from the leachate storage ponds considering monsoon season also.

- Temporarily covering the waste on the tipping floor except the operational area
- There is no further lining of area required. Since the location mentioned is tipping floor for which is with SFRC flooring.
- In respect of one of the unlined legacy leachate pond - it is already cleared and lining works are in progress.

4.0 Conclusions and Recommendations

- x. GHMC has to undertake projects for remediation of contamination in ground water and surface water bodies (ponds) in and around the HIMSWM Project.
- In this regard, Detailed Project Report be prepared engaging an expert agency, by detailing out extent of contamination of Ground water as well as the surface water bodies in and around the HIMSWM Project and identification of remediation technics based on techno-economical feasibility and receptor's health risk considerations for the site followed by execution of the same.
- The said remediation project be carried out under the supervision of Telangana SPCB through a Technical Expert Committee and be monitored by Department of Environment, Govt. of Telangana.

- CPCB is requested to kindly direct the TGPCB to conduct the study review the data and present the facts since the analysis is based on last 6 months data while this site existing since last 20 year

1. Disposal of scientifically stored RDF

A. Issues which led to storage of RDF:

- Approval of establishing the envisaged 48 MW capacity WTE not accorded in 2012.
- Limited off take from cement plants.

B. Present Scenario / Progress:

- 24 MW WTE operational from Aug 2020 at Jawaharnagar and 14.5 MW WTE operational since March' 2024 at Dundigal consuming about **2000 TPD** of RDF as fuel.
- The RDF off take by cement plants has increased from **6 TPD** during 2012- 2015 to **340 TPD** presently to (09) cement plants mentioned below.

ACC	Orient	Ultratech
Ambuja	JSW	Maha cement
HWMP- Haz	India Cements	Green caron

- A 1000 TPD RDF manufacturing facility has been set up to further increase off take by cement plants by value addition to RDF. An MoU has been entered with “My Home Cements” for utilization of this RDF.

C. Future course:

- Proposed to set up (05) more RDF manufacturing units of 1000 TPD capacity each at alternate processing sites within next (05) years to channelize for coprocessing in (33) cement plants present within 300 km distance from GHMC.
- Additional WTE plants of cumulative capacity of 49 MW shall be established. (Jawaharnagar Phase II (24MW), Bibinagar RDF plant (11 MW), SVGPPL project Yacharam (14MW))

Future Action plan

Page No. 194

S.No	Cement Company Name	Plant	State	Kms	Fuel TPD
1	Penna Cement Industries Ltd- Tandur	Tandur	Telangana	136	500
2	Cement Corporation of India Ltd	Tandur	Telangana	140	500
3	The India Cements Ltd- Visaka Cement	Tandur	Telangana	152	500
4	Cement Corporation of India Ltd	Kurkunta	Karnataka	182	500
5	Penna Cement Industries Ltd- Ganeshpahad	Ganeshpahad	Telangana	182	500
6	Kesoram Cement- Vasavadatta	Sedam	Karnataka	183	500
7	Deccan Cement Ltd	Janpahad	Telangana	185	500
8	The India Cements Ltd- Raasi Cement	Wadapally	Telangana	185	700
9	Bhavya Cement Private Ltd	Dachepally	Andhra Pradesh	193	1000
10	Jaypee Cement- Durga Cement Works	Dachepalli	Andhra Pradesh	193	1000
11	The K.C.P. Ltd.- Macherla	Macherla	Andhra Pradesh	194	1000
12	Kesoram Cement- Basant Nagar	Basant Nagar	Telangana	197	1000
13	UltraTech- Rajashree Cement Works	Malkhed	Karnataka	200	1000
14	MPL Cement and Sponge Pvt Ltd	Redlakunta	Telangana	200	500
15	Sagar Cements Ltd	Mattam Palli	Telangana	206	500
16	Hemadri Cement Ltd	Jaggayyapet	Andhra Pradesh	208	500
17	My Home Industries Pvt Ltd	Mella Chervu	Telangana	210	2000
18	Rain Cements Ltd	Mellacheruvu	Telangana	210	1000
19	NCL Industries Ltd (Simhapuri Cement Plant)	Mattapalli	Telangana	212	500
20	Sri Chakra Cements Ltd	Karempudi	Andhra Pradesh	217	500
21	The K.C.P. Ltd- Muktyala	Mukteswarapuram	Andhra Pradesh	219	500
22	ACC Limited - New Wadi Cement Works	Wadi	Karnataka	219	500
23	Anjani Portland Cement Ltd	Chinthala Palem	Telangana	221	500
24	Madras Cements Ltd- Jayanthipuram	Jayanthipuram	Andhra Pradesh	224	500
25	Mancherial Cement Ltd	Mancherial	Andhra Pradesh	234	500
26	Mancherial Cement Ltd	Mancherial	Telangana	234	500
27	Kalaburgi Cement Pvt Ltd	Kalaburgi	Telangana	247	500
28	Chettinad Cement	Kallur	Karnataka	251	500
29	Kakatiya Cement & Sugar Industries Ltd	Peruvancha	Telangana	258	500
30	Orient Cement- Devapur	Devapur	Telangana	260	500
31	Kakatiya Cement & Sugar Industries Ltd	Peruvancha	Telangana	262	500
32	Zuari Cement Ltd.- Sri Vishnu Cement	Guntur	Andhra Pradesh	280	500
33	Cement Corporation of India Ltd - Adilabad	Tirupally	Telangana	300	500
Total					21200

2. Alternate MSW Processing facilities

- (02) alternate sites have been realized at Pyaranagar (150 acres) and Dundigal (85 acres). Action plan:
 - ❖ MSW Processing facility of 2000 TPD capacity at Dundigal within (01) year's time.
 - ❖ MSW Processing facility of 2000 TPD capacity at Pyara Nagar within (01) year's time. Subsequently, the capacity of the plant shall be enhanced to 4000 TPD .
- (02) additional alternate sites have also been identified :
 - ❖ Lakdaram -100 acres (sy no 747): Letter has been addressed to the concerned authority on 20.08.2024 to hand over advanced possession of 100 acres of land for setting up MSW Processing facility.
 - ❖ Malkapur – 200 acres (sy no 617): Letter has been addressed to the concerned authority on 22.05.2024 to identify and alienate about 200 acres of land for setting up MSW Processing facility.

Thank You

GREATER HYDERABAD MUNICIPAL CORPORATION

Municipal Complex, Lower Tankbund Road, Hyderabad – 500 063



From
The Commissioner,
Greater Hyderabad Municipal Corporation,
1st floor, CC Complex,
Lower Tank Bund Road,
Hyderabad.

To
The Member Secretary,
Central Pollution Control Board,
Parivesh Bhawan, East Arjun Nagar,
New Delhi- 110032

Lr.No. SWM/0049/2021/ AE-2(SWM)-HO

dt: 24.08.2024

Sir,

Sub	: GHMC – OA No. 199 of 2021 in Hon'ble NGT (SZ) - Report filed by CPCB dated 14.07,2024 before NGT - Certain mistake of facts were noticed by GHMC - Request for necessary correction - Reg.
Ref	: VC dated 23.08.2024 at 3 pm conducted by MS, CPCB with Expert Committee, GHMC & TGPCB

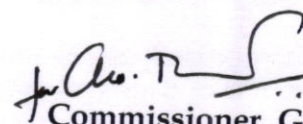
With reference to the directions of the Member Secretary, CPCB in the VC at reference cited above to submit a request for correction of mistakes of facts in the report dated 14.07.2024 filed by the CPCB before the Hon'ble NGT (SZ) in the subject matter of OA No.199 of 2021 brought to the notice by the Executive Engineer, SWM, GHMC in the above VC, necessary corrections required are herewith submitted:

Sl.No.	Para in CPCB report	Para to be corrected as
1.	Pg. No 3 Clause 2.2 (iii) ...unscientific open dump of about 12 Lakh Mt of solid waste ...	...unscientific open dump of about 120 Lakh Mt of solid waste
2.	Pg. No 4 Clause 2.2 (iv) (e) ..Gas handling,concentration and bottling plant capacity is 750KL of methane per day.	..Compressed Bio-Gas plant capacity is 5 TPD of methane.
3.	Pg. No 4 Clause 2.2 (iv) In the flow diagram WTE Plant 1200 TPD Storing as RDF 2760 TPD	WTE Plant 2340 TPD Storing as RDF 1960 TPD
4.	Pg. No 4 Clause 2.2 (vi) ..RDF per day at present is about 1540 TPD and remaining 2760 TPD is stored...	..RDF per day at present is about 2340 TPD and remaining 1960 TPD is stored... (1200 TPD in existing 24 MW WTE at Jawharnagar, 800 TPD existing 14.50 MW WTE in Dundigal+340 TPD offtake by cement Industry)
5.	Pg. No 6 Clause 2.2 (viii) ...Further, 3100 TPD of -70 mm fraction is processed in the Compost plant. However, the	Further, 3800 TPD of -70 mm fraction is processed in the Compost plant. The compost plant processing capacity is 4,000 TPD. Hence, there is no dearth of the

Sl.No.	Para in CPCB report	Para to be corrected as
	compost plant processing capacity is only 2000 TPD. Hence, the remaining 1800 TPD of -70mm fraction is stored in HIMSWM Project. In view of above, only 3540 TPD (43.7%) of the total received waste 8100 TPD is fully utilized and the remaining 4560 TPD (56.3%) of semi-processed waste (2760 TPD of +70 mm fraction and 1800 TPD of -70 mm fraction) accumulates....	processing capacity of -70mm fraction. In view of above, 6140 TPD (75.8%) of the total received waste of 8100 TPD is fully utilized and the remaining 1960 TPD (24.2%) of semi-processed waste (1960 TPD of +70 mm fraction only) accumulates....
6.	Pg. No 7 Clause 2.3.1 (c) Fresh waste being dried for a period of ten days in the composting plant area, prior to trommelling on an unlined area.	Fresh waste being dried for a period of seven days in the composting plant area, prior to trommelling on lined area (Steel-Fibre Reinforced Concrete (SFRC) concrete of 170mm thick which is impermeable).
7.	Pg. No 8 Clause 2.3.2 (c) Fresh waste is being dried for a period of ten days in the composting plant area, prior to trommelling on an unlined area. This area is, however, not lined and there is no proper provision for collection of leachate from this area.	Fresh waste is being dried for a period of seven days in the composting plant area, prior to trommelling on lined area (Steel-Fibre Reinforced Concrete (SFRC) concrete of 170mm thick which is impermeable). There is proper network of drains for collection of leachate from this area.
8.	Pg. No 9 Clause 2.2.3 (a) ...The LTP consists of pre-treatment units with RO followed by Multiple Effect Evaporator (MEE) system. The RO permeate is used for green belt development whereas condensate from MEE is partly utilized in ash quenching of WTE plant, while the rest is disposed in natural storm water drain....	Clause 2.3.3 (a) ...The LTP consists of pre-treatment units with RO followed by Multiple Effect Evaporator (MEE) followed by Agitated Thin Film Drier (ATFD) system. The RO permeate is used for green belt development whereas condensate from MEE is fully utilized in bottom ash quenching of WTE plant....

Hence, the Member Secretary, CPCB is requested to consider the above facts submitted by the GHMC and see that the mistakes of facts stand corrected at the time of filing of the next report before the Hon'ble NGT (SZ) in OA No.199 of 2021.

Yours faithfully,


Commissioner, GHMC

Copy to the Member Secretary, TGPCB with a request to validate the above information and report to CPCB by 27.08.2024 as required by CPCB.



see5_bmw cbmwtf <see5bmw123@gmail.com>

Confirmation on the claim made by GHMC

2 messages

Poornima B M <poornima.cpcb@nic.in>
To: see5bmw123 <see5bmw123@gmail.com>

27 August 2024 at 18:45

Madam,

CPCB submitted its report to Hon'ble NGT on July 14, 2024 and based on the CPCB report, GHMC claims that some of the data were wrongly mentioned and require corrections. Hence it is requested that the claim made by GHMC may be confirmed and validate by TGPCB. The copy of the letter and the CPCB report are enclosed for information.

In the recommendation, point vi. TGPCB has be do characteristic of residues/salts generated by MEE and MVRE to confirm whether it is hazardous or not.

2 attachments

 **Letter to CPCB 24-08-2024.pdf**
867K

 **ilovepdf_merged-2.pdf**
19421K

see5_bmw cbmwtf <see5bmw123@gmail.com>
To: ee-rr2-tspcb@telangana.gov.in

27 August 2024 at 20:02

[Quoted text hidden]

2 attachments

 **Letter to CPCB 24-08-2024.pdf**
867K

 **ilovepdf_merged-2.pdf**
19421K

Email

MATHE SUJANA SREE

Re: Confirmation on the claims made by GHMC for the CPCB report dated July 14, 2024

From : MATHE SUJANA SREE <see-uh3-tspcb@telangana.gov.in>

Fri, Aug 30, 2024 11:04 AM

Subject : Re: Confirmation on the claims made by GHMC for the CPCB report dated July 14, 2024**To :** H D Varalaxmi <rdchennai.cpcb@gov.in>

Madam,

This is to inform that, the Joint Inspection conducted by TGPCB and GHMC officials on 29.08.2024 and submit the report. The report will be forwarded you by 11.:30 AM after getting the approval of MS.

Regards,
Sujana Sree, SEE (MSW)

From: "H D Varalaxmi" <rdchennai.cpcb@gov.in>**To:** "Ravi Gugulothu" <ms-tspcb@telangana.gov.in>**Cc:** "MATHE SUJANA SREE" <see-uh3-tspcb@telangana.gov.in>, "Chairman CPCB" <ccb.cpcb@nic.in>, "MS, CPCB" <mscb.cpcb@nic.in>, "DIVYA SINHA" <divyasinha.cpcb@nic.in>, "H D VARALAXMI SEE CPCB" <vlaxmi.cpcb@nic.in>, "Poornima B M" <poornima.cpcb@nic.in>**Sent:** Thursday, August 29, 2024 3:28:16 PM**Subject:** Confirmation on the claims made by GHMC for the CPCB report dated July 14, 2024

Sir,

In matter of NGT case OA No. 199 of 2021 (SZ), in compliance to Hon'ble NGT order dated April 29, 2024; CPCB submitted its report on July 14, 2024 to Hon'ble NGT. Based on the data and information mentioned in the report, GHMC has submitted the corrections to be made in the report. In this regard, the email was sent on August 27, 2024 to Smt. Sujana Shree, SEE for the confirmation made by the GHMC and yet to receive.

It is requested once again, to send the confirmation report by 6:00PM today.

The copy of the letter dated August 24, 2024 sent by GHMC is attached herewith for information and submission of confirmation report.

Regards

CENTRAL POLLUTION CONTROL BOARD /केंद्रीय प्रदूषण नियंत्रण बोर्ड
Regional Directorate, Chennai / क्षेत्रीय निदेशालय, चेन्नई
2nd Floor, BSNL Building, 40-E, / दूसरी मंजिल, बीएसएनएल बिल्डिंग, 40-ई,
TVK Industrial Estate, / टीवीके इंडस्ट्रियल एस्टेट,
CIPET Road, Guindy / सिपेट रोड, गिंडी,
Chennai, 600032 / चेन्नई, 600032

From : MATHE SUJANA SREE <see-uh3-tspcb@telangana.gov.in>

Thu, Aug 29, 2024 04:02 PM

 1 attachment

Subject : Fwd: Confirmation on the claims made by GHMC for the CPCB report dated July 14, 2024

To : B Rajender <ee-rr2-tspcb@telangana.gov.in>

The CPCB is requesting to submit the report by today. The RO is requested to submit the report at the earliest possible.

From: "H D Varalaxmi" <rdchennai.cpcb@gov.in>

To: "Ravi Gugulothu" <ms-tspcb@telangana.gov.in>

Cc: "MATHE SUJANA SREE" <see-uh3-tspcb@telangana.gov.in>, "Chairman CPCB" <ccb.cpcb@nic.in>, "MS, CPCB" <mscb.cpcb@nic.in>, "DIVYA SINHA" <divyasinha.cpcb@nic.in>, "H D VARALAXMI SEE CPCB" <vlaxmi.cpcb@nic.in>, "Poornima B M" <poornima.cpcb@nic.in>

Sent: Thursday, August 29, 2024 3:28:16 PM

Subject: Confirmation on the claims made by GHMC for the CPCB report dated July 14, 2024

Sir,

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It is requested once again, to send the confirmation report by 6:00PM today.

The copy of the letter dated August 24, 2024 sent by GHMC is attached herewith for information and submission of confirmation report.

Regards

CENTRAL POLLUTION CONTROL BOARD / केंद्रीय प्रदूषण नियंत्रण बोर्ड
Regional Directorate, Chennai / क्षेत्रीय निदेशालय, चेन्नई
2nd Floor, BSNL Building, 40-E, / दूसरी मंजिल, बीएसएनएल बिल्डिंग, 40-ई,
TVK Industrial Estate, / टीवीके इंडस्ट्रियल एस्टेट,
CIPET Road, Guindy / सिपेट रोड, गिंडी,
Chennai, 600032 / चेन्नई, 600032

 **Letter to CPCB 24-08-2024.pdf**
867 KB

From : H D Varalaxmi <rdchennai.cpcb@gov.in>

Thu, Aug 29, 2024 03:42 PM

Subject : Confirmation on the claims made by GHMC for the
CPCB report dated July 14, 2024

 1 attachment

To : Ravi Gugulothu <ms-tspcb@telangana.gov.in>

Cc : MATHE SUJANA SREE <see-uh3-
tspcb@telangana.gov.in>, Chairman CPCB
<ccb.cpcb@nic.in>, MS, CPCB
<mccb.cpcb@nic.in>, DIVYA SINHA
<divyasinha.cpcb@nic.in>, H D VARALAXMI SEE
CPCB <vlaxmi.cpcb@nic.in>, Poornima B M
<poornima.cpcb@nic.in>

Sir,

In matter of NGT case OA No. 199 of 2021 (SZ), in compliance to Hon'ble NGT order dated April 29, 2024; CPCB submitted its report on July 14, 2024 to Hon'ble NGT. Based on the data and information mentioned in the report, GHMC has submitted the corrections to be made in the report. In this regard, the email was sent on August 27, 2024 to Smt. Sujana Shree, SEE for the confirmation made by the GHMC and yet to receive.

It is requested once again, to send the confirmation report by 6:00PM today.

The copy of the letter dated August 24, 2024 sent by GHMC is attached herewith for information and submission of confirmation report.

Regards

CENTRAL POLLUTION CONTROL BOARD / केंद्रीय प्रदूषण नियंत्रण बोर्ड
Regional Directorate, Chennai / क्षेत्रीय निदेशालय, चेन्नई
2nd Floor, BSNL Building, 40-E, / दूसरी मंजिल, बीएसएनएल बिल्डिंग, 40-ई,
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CIPET Road, Guindy / सिपेट रोड, गिंडी,
Chennai, 600032 / चेन्नई, 600032



Letter to CPCB 24-08-2024.pdf

867 KB

Fwd: Report on clarification made by GHMC in OA No. 199 of 2021 (SZ)**BS**

BHARAT SHARMA <mscb.cpcb@gov.in>

Tue, 17 Sep 2024 1:46:18 PM +0530

To "DIVYA SINHA" <divyasinha.cpcb@nic.in>, "Suniti Parashar" <suniti.cpcb@gov.in>

===== Forwarded message =====

From: H Varalaxmi <rdchennai.cpcb@gov.in>To: "chairman-tspcb" <chairman-tspcb@telangana.gov.in>, "Neetu Prasad" <ms-tspcb@telangana.gov.in>, "B. Raghu" <cee-tspcb@telangana.gov.in>Cc: "Chairman CPCB" <ccb.cpcb@nic.in>, "MEMBER SECRETARY CPCB" <mscb.cpcb@nic.in>, "DIVYA SINHA" <divyasinha.cpcb@nic.in>, "Poornima B M" <poornima.cpcb@nic.in>

Date: Tue, 17 Sep 2024 13:13:25 +0530

Subject: Report on clarification made by GHMC in OA No. 199 of 2021 (SZ)

===== Forwarded message =====

Madam/Sir,

In compliance to Hon'ble NGT order dated July 15, 2024 in the matter of OA No. 199 of 2021, CPCB had taken a meeting through Video Conference on August 23, 2024 and while discussing GHMC raised queries on data provided in CPCB report dated July 14, 2024 and requesting for corrections. Hence CPCB requested GHMC to send the letter regarding the clarification. GHMC via email dated August 24, 2024 sent the letter to CPCB for corrections of data.

CPCB again taken a VC meeting on August 27, 2024 with Expert members, GHMC, TGPCB officials and during meeting, Member Secretary, CPCB requested TGPCB officials to clarify for the claims made by GHMC and to submit the report. In this regard, an email was sent to Smt. Sujana Shree, SEE dealing officials on August 27, 2024 for clarification along with a copy of CPCB report dated July 14, 2024 and a letter received by GHMC.

Further Chairman, CPCB taken a meeting on August 28, 2024 with expert members, GHMC & TGPCB officials and detailed discussion was held with GHMC.

To finalize the report as per Hon'ble NGT (SZ) directions, once again reminder email was sent to MS, TGPCB on August 30, 2024 for the report on clarification. After many telephonic remainders to CEE, TGPCB & Smt. Sujana Shree, SEE, TGPCB, the report is yet to be received. Hence, once again requesting to send the report on clarification for the claims made by GHMC by 4:00PM today (September 17, 2024) for finalizing the report as the case is listed for hearing on September 27, 2024. The report needs to be sent to Chairman CPCB for the approval before filing in Hon'ble NGT (SZ) Chennai. If, CPCB does not receive the report by 4PM today then, data mentioned in CPCB report dated July 14, 2024 will remains same.

Regards

CENTRAL POLLUTION CONTROL BOARD / केंद्रीय प्रदूषण नियंत्रण बोर्ड
Regional Directorate, Chennai / क्षेत्रीय निदेशालय, चेन्नई

2nd Floor, BSNL Building, 40-E, / दूसरी मंजिल, बीएसएनएल बिल्डिंग, 40-ई,
TVK Industrial Estate, / टीवीके इंडस्ट्रियल एस्टेट,
CIPET Road, Guindy / सिपेट रोड, गिंडी,
Chennai, 600032 / चेन्नई, 600032

To carry out the feasibility study regarding possibility of remediation of the capped site- Hon'ble NGT order dated 15.07.2024 in O.A No 199 of 2021(SZ) & I.A No 96 of 2022 (SZ) in the matter of Sr Shanker Narayana Bala Krishna Telangana and Ors Vs State of Telangana, Re by its Chief secretary, Hyderabad and Ors-reg

ME

Me <swm.cpcb@gov.in>

Thu, 26 Sep 2024 9:49:33 AM +0530 •

To "absarkazmi" <absar.kazmi@ce.iitr.ac.in>, "ranisajin" <ranisajin@gmail.com>, "sureshkumars-cgwb" <sureshkumars-cgwb@gov.in>, "yrsraonih" <yrsrao.nih@gov.in>, "mjnandan" <mjnandan@res.in>

Cc "Chairman CPCB" <ccb.cpcb@nic.in>, "MEMBER SECRETARY CPCB" <mscb.cpcb@nic.in>, "director" <director@ngri.res.in>, "director" <director@iitr.ac.in>, "dirnih" <dir.nih@gov.in>, "diradm-cgwb" <diradm-cgwb@gov.in>, "DIVYA SINHA" <divyasinha.cpcb@nic.in>, "Suniti Parashar" <suniti.cpcb@gov.in>, "Madnesh Kumar Dubey" <mkdubey.cpcb@gov.in>

Sir/Madam,

This has reference to the Hon'ble NGT Orders in O.A No. 199/2021 and the subsequent meetings convened by CPCB during August – September 2024.

Based on the deliberations during the meeting, details of activities planned to be taken up for remediation of the GHMC dumpsite is as given below:

- a. IIT Roorkee, NIH, CGWB and NGRI to carry out the feasibility study regarding possibility of remediation of the capped site and assessment of extent and trend of contamination of soil, ground water and surface waterbodies, Various aspects related to assessment of capping layer provided, potential hazard related to subsidence of the capped site due to settling waste, feasibility of bio-mining (considering volume of waste, space availability, utilization/disposal options for various rejects/by-products expected to be generated during bio-mining, etc.), leachate management, required remedial measures for waste as well as contaminated soil & water bodies to be covered in the feasibility report. The same be completed in two months.
- b. Thereafter, Detailed Project report (DPR) shall be prepared in accordance with provisions of SWM Rules covering the the above and as per the Feasibility report by IIT Roorkee with assistance from NIH, CGWB and NGRI.
- c. The DPR shall be prepared within a timeline of 06 months and delineate the various actions/activities to be taken along with timeline for remediation of the GHMC dumpsite including remedial measures for waste, contaminated water bodies & soil, in line with the findings of the Feasibility report. The recommendations shall focus on both containing as well as preventing further damage to the surrounding environment.
- d. The cost of preparation of Pre-feasibility report and the DPR shall be raised by IIT Roorkee and may be borne through NGT EC fund at CPCB.
- e. GHMC shall provide all required assistance to IIT Roorkee and other Institutions in preparation of the Feasibility report. CPCB shall co-ordinate the aforementioned activities for the timely completion of the feasibility study for arriving at the future course of action

In view of the above, you are requested to take necessary action at your end to ensure that the planned activities are completed within the stipulated timeline.

Regards

Divya Sinha

Director & Incharge UPC II Div.

CPCB

Item No. 01

Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

Original Application No. 606/2018

Compliance of Municipal Solid Waste Management Rules, 2016
(State of Telangana)

Date of hearing: 14.02.2020

CORAM: **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE MR. JUSTICE S.P WANGDI, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER
HON'BLE MR. SIDDHANTA DAS, EXPERT MEMBER

For Respondent(s):

Mr. Somesh Kumar, Chief Secretary, State of Telangana alongwith Mr. Rajeshwar Tiwari, Special Chief Secretary, EFS&T, Govt. of Telangana
 Mr. M. Dana Kishore, Managing Director, Hyderabad Metropolitan Water Supply & Sewerage Board
 Ms. Neetu Prasad, Member Secretary, PCB Telangana

Mr. Ravi Shankar Prasad, Chairman, CPCB
 Mr. P. Gargava, Member Secretary, CPCB

ORDER

S. No.	CONTENT	PARA No.
I	Preface	1
II	Orders of the Hon'ble Supreme Court transferring the issue of Solid Waste Management and Liquid Waste Management to this Tribunal.	2-6
III	Proceedings Before this Tribunal in pursuance of orders of the Hon'ble Supreme Court till date	7-21
IV	Recent orders of the Hon'ble Supreme Court dated 25.11.2019 and 13.01.2020 having bearing on the matter (M.C. Mehta vs. Union of India, W.P. No. 13029/1985)	22-23
V	25th Report dated 12.02.2019 of the Standing Committee on Urban Development, 16th Lok Sabha on the issue of solid waste management including hazardous waste, medical waste and e-waste	24
VI	Further consideration of the matter in today's hearing	25-40
VII	Directions	41

I. PREFACE:

1. The matter has been put up today in continuation of proceedings on the subject of monitoring execution of orders of this Tribunal on the subject of compliance of waste management (solid and liquid) and other environmental issues, particularly air pollution, in the State of Telangana in terms of earlier orders of this Tribunal and orders of the Hon'ble Supreme Court.

II. ORDERS OF THE HON'BLE SUPREME COURT TRANSFERRING THE ISSUE OF SOLID WASTE MANAGEMENT AND LIQUID WASTE MANAGEMENT TO THIS TRIBUNAL:

2. It is necessary to set out brief background of the proceedings. The Hon'ble Supreme Court vide order dated 02.09.2014 in *Writ Petition No. 888/1996, Almitra H. Patel Vs. Union of India & Ors.*, transferred proceedings pending before it on the subject of solid waste management¹.
3. The matter was earlier considered by the Hon'ble Supreme Court *inter-alia* vide judgments reported in (2000) 2 SCC 679 and (2004) 13 SCC 538 directing scientific disposal of waste by setting up of compost plants/processing plants, preventing water percolation through heaps of garbage, creating focused '**solid waste management cells**' in all States and complying with the Municipal Solid Waste Management Rules, 2016 (SWM Rules, 2016) on urgent

¹ Operative part of the order of the Hon'ble Supreme Court reads:

"Enforcement of the Rules and efforts to upgrade the technology relevant to the handling of solid municipal waste is a perennial challenge and would require constant efforts and monitoring with a view to making the municipal authorities concerned accountable, taking note of dereliction, if any, issuing suitable directions consistent with the said Rules and direction incidental to the purpose underlying the Rules such as upgradation of technology wherever possible. **All these matters can, in our opinion, be best left to be handled by the National Green Tribunal established under the National Green Tribunal Act, 2010.** The Tribunal, it is common ground, is not only equipped with the necessary expertise to examine and deal with the environment related issues but is also competent to issue in appropriate cases directions considered necessary for enforcing the statutory provisions."

basis. **It was observed that the local authorities constituted for providing services to the citizens are lethargic and insufficient in their functioning which is impermissible. Non-accountability has led to lack of effort on the part of the employees.** Domestic garbage and sewage along with poor drainage system in an unplanned manner contribute heavily to the problem of solid waste. The number of slums have multiplied significantly occupying large areas of public land. Promise of free land attracts more land grabbers. **Instead of “slum clearance” there is “slum creation” in cities which is further aggravating the problem of domestic waste being strewn in the open.** Accordingly, the Court directed that provisions pertaining to sanitation and public health be complied with, streets and public premises be cleaned daily, **statutory authorities levy and recover charges from any person violating laws and ensure scientific disposal of waste,** landfill sites be identified keeping in mind requirement of the city for next 20 years and environmental considerations, sites be identified for setting up of compost plants, steps be taken to prevent fresh encroachments and compliance report be submitted within eight weeks.

4. Further observations in the judgment of the Hon'ble Supreme Court²are:

“3. The petitioner has handed over a note in the Court showing the progress that has been made in some of the States and also setting out some of the suggestions, including the suggestion for creation of solid waste management cell, so as to put a focus on the issue and also to provide incentives to those who perform well as was tried in some of the States. The said note states as under:

“1. As a result of the Hon'ble Supreme Court's orders on 26-7-2004, in Maharashtra the number of authorisations granted for solid waste management (SWM) has increased

² (2004) 13 SCC 538

from 32% to 98%, in Gujarat from 58% to 92% and in M.P. from NIL to 34%. No affidavits at all have been received from the 24 other States/UTs for which CPCB reported NIL or less than 3% authorisations in February 2004. All these States and their SPCBs can study and learn from Karnataka, Maharashtra and Gujarat's successes.

2. **All States/UTs and their SPCBs/PCCs have totally ignored the improvement of existing open dumps, due by 31-12-2001**, let alone identifying and monitoring the existing sites. Simple steps can be taken immediately at almost no cost by every single ULB to prevent monsoon water percolation through the heaps, which produces highly polluting black run-off (leachate). Waste heaps can be made convex to eliminate standing water, upslope diversion drains can prevent water inflow, downslope diversion drains can capture leachate for recirculation onto the heaps, and disused heaps can be given soil cover for vegetative healing.
3. **Lack of funds is no excuse for inaction. Smaller towns in every State should go and learn from Suryapet in A.P. (population 103,000) and Namakkal in T.N. (population 53,000) which have both seen dustbin-free 'zero garbage towns' complying with the MSW Rules since 2003 with no financial input from the State or the Centre, just good management and a sense of commitment.**
4. **States seem to use the Rules as an excuse to milk funds from the Centre, by making that a precondition for action and inflating waste processing costs 2-3 fold. The Supreme Court Committee recommended 1/3 contribution each from the city, State and Centre. Before seeking 70-80% Centre's contribution, every State should first ensure that each city first spends its own share to immediately make its wastes non-polluting by simple sanitising/stabilising, which is always the first step in composting viz. inoculate the waste with cow dung solution or bio culture and placing it in windrows (long heaps) which are turned at least once or twice over a period of 45 to 60 days.**
5. Unless each State creates a focussed '**solid waste management cell**' and rewards its cities for good performance, both of which Maharashtra has done, compliance with the MSW Rules seems to be an illusion.
6. **The admitted position is that the MSW Rules have not been complied with even after four years. None of the functionaries have bothered or discharged their duties to ensure compliance. Even existing dumps have not been improved.** Thus deeper thought and urgent and immediate action is necessary to ensure compliance in future."

5. In this regard, reference may also be made to orders of Hon'ble Supreme Court in *Municipal Council, Ratlam vs. Vardhichand*³ and *B.L. Wadhera v. Union of India and Ors.*⁴ laying down that **clean environment is fundamental right of citizens under Article 21** and it is for the local bodies as well as the State to ensure that public health is preserved by taking all possible steps. **For doing so, financial inability cannot be pleaded.**

6. The Hon'ble Supreme Court also dealt with the issue of liquid waste management and after issuing requisite directions, required this Tribunal to monitor the compliance. Directions of the Hon'ble Supreme Court include steps for liquid waste management by setting up requisite treatment plants for which funds are to be generated by the local bodies and the States as per constitutional provisions.⁵

³ (1980) 4 SCC 162

⁴ (1996) 2 SCC 594

⁵ "10. Given the responsibility vested in municipalities under Article 243-W of the Constitution, as also, in Item 6 of Schedule XII, wherein the aforesaid obligation, pointedly extends to "public health, sanitation conservancy and solid waste management", we are of the view that the onus to operate the existing common effluent treatment plants, rests on municipalities (and/or local bodies). Given the aforesaid responsibility, the municipalities (and/or local bodies) concerned, cannot be permitted to shy away from discharging this onerous duty. **In case there are further financial constraints, the remedy lies in Articles 243-X and 243-Y of the Constitution. It will be open to the municipalities (and/or local bodies) concerned, to evolve norms to recover funds,** for the purpose of generating finances to install and run all the "common effluent treatment plants", within the purview of the provisions referred to hereinabove. **Needless to mention that such norms as may be evolved for generating financial resources, may include all or any of the commercial, industrial and domestic beneficiaries, of the facility.** The process of evolving the above norms, shall be supervised by the State Government (Union Territory) concerned, through the Secretaries, Urban Development and Local Bodies, respectively (depending on the location of the respective common effluent treatment plant). **The norms for generating funds for setting up and/or operating the "common effluent treatment plant" shall be finalised, on or before 31-3-2017, so as to be implemented with effect from the next financial year. In case, such norms are not in place, before the commencement of the next financial year, the State Governments (or the Union Territories) concerned, shall cater to the financial requirements, of running the "common effluent treatment plants", which are presently dysfunctional, from their own financial resources.**

11. **Just in the manner suggested hereinabove, for the purpose of setting up of "common effluent treatment plants", the State Governments concerned (including, the Union Territories concerned) will prioritise such cities, towns and villages, which discharge industrial pollutants and sewer, directly into rivers and water bodies.**

13. We are of the view that mere directions are inconsequential, unless a rigid implementation mechanism is laid down. The said data shall be furnished to the Central Ground Water

III. PROCEEDINGS BEFORE THIS TRIBUNAL IN PURSUANCE OF ORDERS OF THE HON'BLE SUPREME COURT TILL DATE:

Solid Waste Management:

Order dated 22.12.2016:

7. This Tribunal considered the matter of solid waste management after notifying all the concerned States/Regulatory Bodies and finally disposed of the same on 22.12.2016⁶ requiring all the States/UTs to follow the SWM Rules, 2016 after preparing requisite action plans in a time bound manner with further direction that **any State/UT which failed to comply with the Rules shall be liable to be proceeded against under Section 15 of the Environment (Protection) Act, 1986 (EP Act), apart from being required to pay environmental compensation and senior most officers of the States/Local Bodies being personally liable.** The directions also include requirement for segregation of waste, providing buffer zone around plants and landfill sites and due monitoring. The States/Local Bodies were also to create market for consumption of Refuse-Derived Fuel (RDF). Tipping fee was to include the efficient and regular monitoring of waste processing plant, segregation of inert and Construction and Demolition(C&D) material and its transportation. Landfill sites were required to be bio-stabilized preventing leachate and generation of Methane, enforcement of Extended Producer Responsibility, rights and liabilities under

Authority, which shall evaluate the data and shall furnish the same to the Bench of the jurisdictional National Green Tribunal.

14. **To supervise complaints of non-implementation of the instant directions, the Benches concerned of the National Green Tribunal, will maintain running and numbered case files, by dividing the jurisdictional area into units. The abovementioned case files will be listed periodically.** The Pollution Control Board concerned is also hereby directed to initiate such civil or criminal action, as may be permissible in law, against all or any of the defaulters.”

⁶ O.A. No. 199/2014 (2016) SCC Online NGT 2981

contracts being made consistent with the Rules, creating public awareness about the facilities available at regular intervals. **Copy of the judgment was circulated to all the Chief Secretaries/ Advisors of States/UTs.**

8. **Execution of above directions has been subject matter of further proceedings in the last more than three years after the said order and after almost 20 years after the orders of the Hon'ble Supreme Court.**

Order dated 20.08.2018:

9. Reference may be now made to some further significant orders. Vide order dated 20.08.2018⁷, after referring to earlier proceedings and a chamber meeting with all the concerned stakeholders, the Tribunal considered the following questions:

- i. Whether State-wise Action Plan with timelines and budgetary support/provision for management of MSW has been prepared?*
- ii. Whether each city/town/urban local body is covered under the said Plan and individual Action Plan has timelines with budgetary provisions?*
- iii. What time has been fixed to completely comply with the provisions of the Rules, 2016?*
- iv. What are the main constraints of non-compliance of Rules, 2016?"*

It was directed that action plans be finalized latest by 31.10.2018 and executed latest by 31.12.2019 which was to be overseen by the Principal Secretaries of Urban/Rural Development Departments of States/UTs. States were directed to standardize technical specifications instead of leaving the same to individual local bodies. Further directions are for installing CCTV cameras at dump sites, installing GPS system in garbage collection vans, adopting best practices including control rooms where citizens

⁷ O.A. No. 606/2018

can upload photos of garbage to be looked into by responsible officers, conducting performance audit with reference to source segregation, door to door collection, public sweeping, waste processing, grievance redressal mechanism and monitoring. This Tribunal also constituted Regional/Apex Committees for a limited period.

Sewage Management:

10. Apart from the issue of SWM, the Tribunal also dealt with the issue of sewage management in pursuance of order of the Hon'ble Supreme Court in *Paryavaran Suraksha vs. Union of India*⁸ requiring this Tribunal to monitor directions for proper treatment of sewage to prevent untreated sewage and other effluents being discharged in water bodies. On 28.08.2019, it was directed that 100% sewage treatment must be ensured by all local bodies. Vide further order dated 06.12.2019 in O.A. No. 673/2018⁹, the Tribunal directed that for failure to commence in-situ remediation, compensation will be payable at the rate of Rs. 5 lakh per month per drain after 31.03.2020 and for failure to commence setting up of STPs after 31.03.2020 compensation is to be paid at the rate of Rs. 5 lakh per month per STP. For failure to complete the project, compensation has to be paid at the rate of Rs. 10 lakh per STP per month after 31.03.2021. Relevant part of the order is quoted below:

“47. (i) 100% treatment of sewage may be ensured as directed by this Tribunal vide order dated 28.08.2019 in O.A. No. 593/2017 by 31.03.2020 atleast to the extent of in-situ remediation and before the said date, commencement of setting up of STPs and the work of connecting all the drains and other sources of generation of sewage to the STPs must be ensured. If this is not done, the local bodies and the concerned

⁸ (2017) 5 SCC 326

⁹ News item published in "The Hindu" authored by Shri Jacob Koshy Titled "More river stretches are now critically polluted: CPCB"

*departments of the States/UTs will be liable to pay compensation as already directed vide order dated 22.08.2019 in the case of river Ganga i.e. **Rs. 5 lakhs per month per drain, for default in in-situ remediation and Rs. 5 lakhs per STP for default in commencement of setting up of the STP.***

ii. Timeline for completing all steps of action plans including completion of setting up STPs and their commissioning till 31.03.2021 in terms of order dated 08.04.2019 in the present case will remain as already directed. In default, compensation will be liable to be paid at the scale laid down in the order of this Tribunal dated 22.08.2019 in the case of river Ganga i.e. **Rs. 10 lakhs per month per STP.”**

Other issues:

11. Apart from solid waste management and sewage management, the Tribunal is seized of other significant environmental issues in separate proceedings including 351 polluted river stretches¹⁰, 122 non-attainment cities¹¹, 100 polluted industrial clusters¹², illegal sand mining¹³, reuse of treated water¹⁴, restoration of water bodies¹⁵, compliance of Plastic Waste, Bio-medical waste etc.¹⁶, carrying capacity study¹⁷, remediation of legacy waste sites¹⁸, preparation of District Environment Plans¹⁹, Hazardous Waste Management Rules²⁰, depletion of ground water in over-exploited, critical and semi-critical areas²¹. However, for today's consideration, as directed vide order dated 07.01.2020, primary monitoring is focused at:

(i) Solid waste management including legacy waste.

(ii) Sewage management and 351 polluted river stretches.

¹⁰ Vide order dated 06.12.2019, O.A. No. 673/2018

¹¹ Vide order dated 20.11.2019, O.A. No. 681/2018

¹² Vide order dated 14.11.2019, O.A. No. 1038/2018

¹³ Vide order dated 26.07.2019, O. A. No. 360/2015

¹⁴ Vide order dated 10.05.2019, O.A. No. 148/2016

¹⁵ Vide order dated 10.05.2019, O.A. No. 325/2015

¹⁶ Vide order dated 24.04.2019, O.A. No. 606/2018 – Karnataka

¹⁷ Vide order dated 11.02.2019, Appeal No. 122/2018

¹⁸ Vide order dated 17.07.2019, O.A. No. 519/2019 with O.A. No. 386/2019

¹⁹ Vide order dated 25.07.2019, O.A. No. 710/2017

²⁰ Vide order dated 26.08.2019, O.A. No. 804/2017

²¹ Vide order dated 10.10.2019, O.A. No. 176/2015

(iii) Air quality management in 122 non-attainment cities.**Order dated 16.01.2019:**

12. Vide order dated 16.01.2019, after noticing that statutory timelines under Rule 22 had expired for various steps and failure of the statutory authorities was punishable criminal offence under the provisions of the EP Act as well as under the provisions of the National Green Tribunal Act, 2010 (NGT Act), this Tribunal required presence of Chief Secretaries of all States/UTs. The timelines in the said Rule are as follows:

Sl. No.	Activity	Time limit from the date of notification of rules
(1)	(2)	(3)
1.	Identification of suitable sites for setting up solid waste processing facilities.	1 year
2.	Identification of suitable sites for setting up common regional sanitary landfill facilities for suitable clusters of local authorities under 0.5 million population and for setting up common regional sanitary landfill facilities or stand alone sanitary landfill facilities by all local authorities having a population of 0.5 million or more.	1 year
3.	Procurement of suitable sites for setting up solid waste processing facility and sanitary landfill facilities.	2 years
4.	Enforcing waste generators to practice segregation of bio degradable, recyclable, combustible, sanitary waste domestic hazardous and inert solid wastes at source.	2 years
5.	Ensure door to door collection of segregated waste and its transportation in covered vehicles to processing or disposal facilities.	2 years
6.	ensure separate storage, collection and transportation of construction and demolition wastes.	2 years
7.	setting up solid waste processing facilities by all Local Bodies having 100000 or more population.	2 years
8.	Setting up solid waste processing facilities by Local Bodies and census towns below 100000 population.	3 years

9.	<i>setting up common or stand alone sanitary landfills by or for all Local Bodies having 0.5 million or more population for the disposal of only such residual wastes from the processing facilities as well as untreatable inert wastes as permitted under the Rules.</i>	3 years
10.	<i>setting up common or regional sanitary landfills by 3 years all Local Bodies and census towns under 0.5 million population for the disposal of permitted waste under the rules.</i>	3 years
11.	<i>bio-remediation or capping of old and abandoned dump sites.</i>	5 years

”

13. It was noted that apart from failure of solid waste management, there was also failure of liquid waste management. Such failure had resulted in 351 identified polluted river stretches, 102 (now 122) non-attainment cities in terms of air quality, 100 polluted industrial clusters and other serious environmental consequences, threatening life and health of citizens, water and air quality and the climate. The Chief Secretaries of all States/UTs were required to acquaint themselves with specific issues mentioned in the said order and coordinate with all the concerned authorities in their respective States/UTs and appear before this Tribunal with their respective status reports. Other directions included constitution of special task force in each district for awareness by involving educational, religious and social organizations, including local Eco-clubs.

14. The issues specified were as follows:

- a. *Status of compliance of SWM Rule, 2016, Plastic Waste Management Rules, 2016 and Bio-Medical Waste Management Rules, 2016 in their respective areas.*
- b. *Status of functioning of Committees constituted by this order.*
- c. *Status of the Action Plan in compliance vide order dated 20.09.2018 in the News Item published in “The Hindu” authored by Shri Jacob Koshy Titled “More river stretches are now critically polluted: CPCB (Original Application No. 673/2018).*

- d. *Status of functioning of Committees constituted in News Item Published in "The Times of India" Authored by Shri Vishwa Mohan Titled "NCAP with Multiple timelines to Clear Air in 102 Cities to be released around August 15" dated 08.10.2018 (O.A. No. 681/2018).*
- e. *Status of Action Plan with regard to identification of polluted industrial clusters in O.A. No. 1038/2018, News item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels" dated 13.12.2018.*
- f. *Status of the work in compliance of the directions passed in O.A. No. 173 of 2018, Sudarsan Das v. State of West Bengal & Ors. Order dated 04.09.2018.*
- g. *Total amount collected from erring industries on the basis of 'Polluter Pays' principle, 'Precautionary principle' and details of utilization of funds collected.*
- h. *Status of the identification and development of Model Cities and Towns in the State in the first phase which can be replicated later for other cities and towns of the State."*

15. Accordingly, the Chief Secretaries of the States/UTs appeared and interacted with this Tribunal. The Tribunal noted unsatisfactory state of affairs on the subject of environmental governance in the country and serious non-compliance of statutory mandate, need to ensure that statutory regulators performed their duty and are manned by credible persons. Failure in this regard had potential for public health and environment and sustainable development goals. It was noted that SOP had been prepared for clearance of legacy waste and circulated to the SPCBs/PCCs which had been successfully implemented at some places like Indore.

16. After interaction with the Chief Secretaries on several dates, further directions were issued which were by and large on same pattern as non-compliance was found by all the States/UTs. It will suffice to refer to the observations and directions issued vide order dated

18.07.2019 in respect of State of J&K, which was the last State in the series of interactions:

Observations:

“36. Needless to say that improvement in environment is not only inalienable duty of the State, but is also necessary for sustainable development which is essential for the health and well-being of citizens as well as for intergenerational equity. These principles require that all human activities should be conducted in such a way that the rights of future generations to access clean air and potable water are not taken away. **At the cost of repetition, it may be mentioned that water is being polluted because of discharge of untreated sewage and effluents. Air pollution is result of failure to manage solid waste and to prevent other causes leading to air pollution.** There are also other issues like deterioration in groundwater level, damage to forests and wild life, unscientific and uncontrolled sand mining etc. Unsatisfactory implementation of law is clear from the fact that in spite of severe damage, there is no report of any convictions being recorded against the polluters, nor adequate compensation has been recovered for damage caused to the environment. Steps for community involvement are not adequate. There is reluctance even to declare some major cities as fully compliant with the environment norms. **The authorities have not been able to evolve simplified and standard procedure for preparing project reports and giving of contracts. There is no satisfactory plan for reuse of the treated water or use of treated sewage or waste and for segregation and collection of solid waste, for managing the legacy waste or other wastes, etc.**

37. Since we have found huge gap in steps taken and steps required to be taken to remedy the unsatisfactory state of environment, we had an interaction with the Chief Secretary about the way forward. The gap in the mandate of law on the one hand and actual compliance with law on the other has manifested itself in the form of polluted water, air and land. Its actual measurement in terms of monetary value or the loss on account of adverse impact on public health and environment or otherwise in terms of number of deaths or diseases does not appear to have been duly and exhaustively undertaken by the official machinery so far for the country or for any particular area. The private reports mention diseases by pollution in the state of J&K, as already noted in the para 33 above. There are also various studies reporting about number of deaths and diseases in India by pollution.²² Death by pollution may be comparable to an offence of homicide and any disease on that account may be likewise comparable to attempt to murder or grievous hurt. Polluter is, thus,

²²<https://www.healtheffects.org/publication/gbd-air-pollution-india>

To the effect that 3283 Indians died per day due to outdoor air pollution in India in 2015, making the potential number of deaths due to outdoor air pollution in India in 2015 to 11.98 lakh.

liable to be dealt with in the same manner as a person committing any other heinous crime as per law of the land. Mere fact that such polluter creates wealth or employment does not make the offence less serious. The statutory framework prohibits polluting activity and provides for penal consequences. Further, the 'Polluter Pays' principle requires compensation to be recovered to meet the cost of remedying the adverse impact of pollution. Governance of such laws can be held to be satisfactory if the magnitude of punishment of law violators corresponds to the extent of violation of law and the compensation recovered is adequate to meet the cost of damage. There is enough evidence of pollution but no data is shown of corresponding convictions or recovery of adequate compensation for restoration of environment. This calls for authentic study of the extent of damage to the environment and to the public health so that policy makers and law enforcers can bridge the gap.

38. In case extent of convictions for the environment related offences do not correspond to the extent of crime, paradigm shift in policies and strategies for implementation of law may need to be considered. Similarly, the mechanism for recovery of compensation may need to be revised on that pattern. Such review of policy cannot be left to the local bodies or the Pollution Control Boards but has to be at highest level in the State and further review at the national level. As noted in some of the studies, the ranking of the country in compliance of environmental norms needs to be brought to respectable higher position which may be possible only if there is change in policies and strategies for implementation of necessary norms at every level in right direction. **The scale of compensation needs to be suitably revised so that the same is deterrent and adequate to meet the cost of reversing the pollution.**

39. Authentic data is required to be compiled which is necessary for proper policy making. The Rules provide for such data to be collected at the state level as well as at the national level. If such data is not furnished timely from ground level with all the requisite details, the policy making remains deficient. **Since none of the States is fully compliant with the mandate of statutory waste management rules under various headings, as already noted, remedial measures are necessary.** We consider it necessary to observe that at least some major cities/towns/villages be first developed as model and thereafter successful experiment replicated in remaining cities/towns/villages.

40. Though environment is priceless and no amount of compensation may be sufficient for real restoration of environment to its pristine glory, the 'Polluter Pays' principle requires cost of restoration to be recovered which should be deterrent and also include Net Present Value (NPV) for environmental services forgone forever. **Though such compensation is to be primarily recovered from polluters, where authorities fail to implement law and recover compensation on account of collusion or inaction, such authorities can also be made accountable and required to pay compensation.** Strong

central mechanism of auditing the compliance of environmental laws by the States and the Union Territories (UTs) is necessary. We are also of the view that to encourage enforcement of environmental laws, cognizance of performance or otherwise need to be taken by authorities allocating funds. Incentives can be given to encourage compliance and those deficient in compliance may be required to comply as a condition for getting grants or part of such grants. Such a policy may be a step in the right direction for achieving sustainable development goals. We take note of discussion on the subject in the minutes of National Development Council held on 01.10.1990.²³ Therein a formula called “Gadgil – Mukerjee” formula is referred to envisaging grants to meet environmental problems. We may add that while such grants may be necessary, there may be a condition requiring measurable and demonstrable improvement in time bound manner as a condition for the grant. Accordingly, vide order dated 24.04.2019 a copy of this order has been sent to Niti Aayog, Finance Commission and MoEF&CC to consider the observations, particularly in this para.

41. One major hurdle in compliance of the Rules is lack of institutional training mechanism. Scheme of Rules and strategies for implementation, including technology to be used, best practices to be employed need to be identified. Resource persons, target group of persons to be trained, location at which training is to be undertaken need to be worked out.

42. **It is also necessary to have an Environment Plan for the country as well as for the States which may identify and publish gaps in compliance of environmental law and indicate action plan to remedy the same.** Compliance of environmental norms also requires carrying capacity study not only of eco-sensitive areas but also areas where violation of environmental laws has clearly surfaced out based on scientific data published by CPCB such as non-attainment cities in terms of air quality, critically polluted industrial clusters on account of air/water pollution, polluted river stretches etc. Drastic remedial measures may be necessary to deal with the same which should not merely be responsive but proactive by way of planning population density, vehicle numbers, nature and quality of vehicles, nature and quality of activity to be allowed. **Absence of such measures may render it difficult to meaningfully implement the accepted norms of ‘Sustainable Development’ or ‘Intergenerational Equity’.** Such planning is part of ‘Precautionary’ principle. ‘Polluter Pays’ principle can be meaningfully implemented only when assessment of damage is realistic and compensation recovered matches the extent of damage. As per census of India 2011, there are 475 places with 981 overgrowths (OGs) have been identified as Urban Agglomeration (UA). The number of total towns in India is 7,935 (Statutory Towns 4,041 + Census Towns 3,894). There are total 6,166 Urban Agglomeration/towns which constitutes the urban frame of the country. During FY 2017-2018, out of 35 SPCBs/PCCs only 16 SPCBs/ PCCs reported the status of Solid

²³http://planningcommission.gov.in/aboutus/committee/wrkgrp12/wg_state_finan0106.pdf

Waste Management Rules, 2016.²⁴ **In view of these statistics, emergent and stringent measures are required for compliance of environmental norms.**

43. We discussed with the Chief Secretary the above unsatisfactory situation of environment and about **need for having an effective monitoring cell directly attached to the office of the Chief Secretary** with experts in environment and related issues to assist the Chief Secretary.

44. The presence of Chief Secretary before this Tribunal was directed with an expectation that there will be realization of seriousness at the highest level which may percolate in the administration.”

Directions:

“45. In view of above, after discussion with the Chief Secretary, following further directions are issued:

- i. Apart from three towns said to have been notified as proposed models for compliance of Environmental norms, atleast three villages in every District of the State may be notified on the website of the State within two weeks from today which will be made fully compliant with environmental norms within the next six months. Remaining cities, towns and villages of the State may be made fully compliant in respect of environmental norms within one year.
- ii. A quarterly report be furnished by the Chief Secretary, every three months. First such report shall be furnished by October, 10, 2019.
- iii. The Chief Secretary may personally monitor the progress, atleast once in a month, with all the District Magistrates.
- iv. The District Magistrates may monitor the status of compliance of environmental norms, atleast once in two weeks.
- v. The District Magistrates or other Officers may be imparted requisite training.
- vi. Estimate of value of environmental degradation and cost of restoration be prepared and compensation be planned and recovered from polluters for environmental restoration and restitution on that basis.
- vii. Performance audit of functioning of all regulatory bodies may be got conducted and remedial measures be taken, within six months.
- viii. Introduction of a policy of giving ranking, based on performance on the subject of environment and giving of rewards or other incentives on that basis to individual areas, localities, institutions or individuals may be considered. This may also include encouraging students or

²⁴ Annual report of CPCB for the year 2017-18 accessible at: http://cpcb.nic.in/uploads/hwmd/MSW_AnnualReport_2017-18.pdf

other citizens significantly contributing to the cause of environment. The best practices may be evolved, if necessary, in the light of experiences on the subject. This may help in educating and involving public at large which may help in enhancing of environmental laws.

- ix. *The Chief Secretary may remain present in person before the Tribunal with the status of compliance in respect of various issues mentioned in para 22 as well as any other issues discussed in the above order on 10.02.2020 at 2.p.m. It is made clear that Chief Secretary may not delegate the above function and the further requirement of appearance before this Tribunal to anyone else. However, it will be open to him to change the date, by advance intimation by e-mail at ngt.filing@gmail.com to adjust their convenience.*

A copy of the compliance report furnished by the Chief Secretary be sent to CPCB as already directed vide order dated 24.04.2019 for the State of Karnataka (supra)."

17. It was further directed that compliance reports be furnished by the States/UTs to CPCB. Reference may also be made to some further orders on the subject being dated 08.04.2019²⁵, 22.04.2019²⁶, 23.04.2019²⁷, 24.04.2019²⁸, 11.02.2019²⁹, 08.03.2019³⁰, 02.11.2018³¹, 10.05.2019³², 10.05.2019³³, 17.07.2019³⁴,

²⁵ O.A. No. 673/2018, News item published in 'The Hindu' authored by Shri Jacob Koshy Titled "More river stretches are now critically polluted: CPCB" (**directing effective steps for remediation of the polluted river stretches.**)

²⁶ OA No. 606/2018 - Meghalaya (**directing training and capacity building at National and State Level**)

²⁷ O.A. No. 606/2018 - Tamil Nadu (**directing preparation of Annual Environment Plan giving status of compliance to environmental norms and gaps therein including assessment of damage to the environment in monetary terms**)

²⁸ O.A. No. 606/2018 - Karnataka (**directing monitoring of compliance of Plastic Waste, Bio-medical waste, Sewage Waste and air pollution**)

²⁹ Appeal No. 122/2018, Anil Tharthare Vs. The Secretary, Env't. Dept. Govt. of Maharashtra & Ors. Para 33 of the order wherein the Tribunal directed constitution of a five Members Expert Committee to carry out **carrying capacity study** of the area for relevant environment parameters and impact of such expansion on already congested and stressed areas.

³⁰ O.A. No. 568/2016, Ajay Khera Vs. Container Corporation of India Limited & Ors, the Tribunal directed the Container Corporation of India (CONCOR) to phase out diesel vehicles, used for transportation by the Inland Container Depot (ICD) Tughlakabad, within six months.

³¹ O.A. No. 400/2017, Westend Green Farms Society Vs. Union of India & Ors. Para 28 of the order wherein the Tribunal directed carrying capacity assessment to regulate activities violating environmental laws.

³² O.A. No. 148/2016, Mahesh Chandra Saxena Vs. South Delhi Municipal Corporation & Ors. (**Reuse of treated water**)

³³ O.A. No. 325/2015, Lt. Col. Sarvadaman Singh Oberoi Vs. Union of India & Ors. (**restoration of water bodies**)

³⁴ Original Application No. 519/2019 WITH Original Application No. 386/2019 (**remediation of legacy waste sites**)

22.07.2019³⁵, 25.07.2019³⁶, 26.07.2019³⁷, 26.08.2019³⁸,
28.08.2019³⁹, 11.09.2019⁴⁰, 11.09.2019⁴¹, 10.10.2019⁴²,
14.11.2019⁴³, 19.11.2019⁴⁴, 20.11.2019⁴⁵, 06.12.2019⁴⁶ and
18.12.2019⁴⁷.

18. The Registry was directed to forward quarterly reports received from the Chief Secretaries as and when received to the CPCB so that CPCB may prepare a gap analysis report and present the same to this Tribunal.

19. Accordingly, the CPCB filed following reports:

- i. *Report dated 09.09.2019 enclosing Annual Environment Plan for the country giving compliance of environment norms and gaps.*
- ii. *Report dated 09.09.2019 annexing Preliminary Framework for Imposing Environmental Damage Compensation.*
- iii. *Report dated 09.09.2019 on the subject of Methodology of Assessment of Environment Carrying Capacity.*
- iv. *Gap Analysis report filed on 06.09.2019 on the subject of compliance of solid waste, plastic waste, bio-medical waste management, rejuvenation of identified polluted river stretches, polluted industrial clusters, non-attainment cities.*
- v. *Report dated 24.07.2019 on Framework on national environmental training program.*
- vi. *Status report dated 09.08.2019 on Information, Education & Communication (IEC) activities.”*

Order dated 12.09.2019:

³⁵ Execution Application No. 13/2019 (**Plastic Waste Management**)

³⁶ O.A. No. 710/2017 (**preparation of District Environment Plans**)

³⁷ O. A. No. 360/2015 (**Illegal sand mining**)

³⁸ O.A. No. 804/2017 (**Hazardous Waste Management Rules**)

³⁹ O.A. No. 593/2017 (**requirement of 100% treatment of sewage and effluents**)

⁴⁰ O.A. No. 148/2016 (**utilization of treated waste water**)

⁴¹ O.A. No. 496/2016 (**ground water management, rain water harvesting**)

⁴² O.A. No. 176/2015 (**depletion of ground water in over-exploited, critical and semi-critical areas**)

⁴³ O.A. No. 1038/2018 (**polluted industrial clusters**)

⁴⁴ O.A. No. 519/2019 (**legacy waste dump sites**)

⁴⁵ O.A. No. 681/2018 (**non-attainment cities in terms of air quality and also control of noise pollution**)

⁴⁶ O.A. No. 673/2018 (**351 polluted river stretches**)

⁴⁷ O.A. No. 200/2014 (**pollution of river Ganga**)

20. The Tribunal vide order dated 12.09.2019 considered the above and directed all the States/UTs to furnish information to the CPCB as follows:

“3. We have heard learned Counsel for the CPCB for future course of action and further directions required on the above subjects. He submitted that the above reports are incomplete for want of information from the States/UTs. It was elaborated during the course of hearing that information is required to be submitted in terms of following thematic areas viz.

- Compliance to Solid Waste Rules including Legacy Waste.
- Compliance to Bio-medical Waste Rules.
- Compliance to Construction & Demolition Waste.
- Compliance to Hazardous Waste Rules.
- Compliance to E-waste Rules.
- 351 Polluter Stretches in the country.
- 122 Non-attainment cities.
- 100 industrial clusters.
- Status of STPs and re-use of treated water.
- Status of CETPs/ETPs including performance.
- Ground water extraction/contamination and re-charge.
- Air pollution including noise pollution.
- Illegal sand mining.
- Rejuvenation of water bodies.

4. The information with regard to above thematic areas needs to be submitted to CPCB by the Chief Secretaries of all the States and Union Territories in terms of following:

- Current status
- Desirable level of compliance in terms of statutes.
- Gap between current status and desired levels.
- Proposal of attending the gap with time lines.
- Name and designation of designated officer for ensuring compliance to provisions under statute.

5. CPCB is permitted to file revised updated reports on the subject after collecting information from concerned States/UTs by 15.11.2019.”

Order dated 07.01.2020:

21. The status report dated 27.12.2019 with reference to the above thematic areas was considered on 07.01.2020 and it was observed:

“12. The reports give information about States who have given some information but the nature and extent of information which was required has not been furnished. Available information with regard to

sewage generation and treatment shows huge gap. Grading made by the CPCB into 'good', 'average', 'poor' and 'no information' is not based on any qualitative analysis but extent of information furnished.

Instead, what is least expected is information on:

- (i) solid waste management, including remediation of legacy waste in terms of earlier orders of this Tribunal,*
- (ii) sewage treatment and restoration of 351 polluted river stretches and*
- (iii) air quality management in 102 (122) non-attainment cities.*

With respect to serial no. (i), the information is required with regard to the quantity of MSW generated, segregated and treated; gaps in the waste processing in terms of generation and treatment and enforcement of statutory timelines and orders of this Tribunal for bridging the gap; number of sites, and quantity of legacy waste therein and timelines for its remediation.

With respect to serial no. (ii), quantity of sewage generated and treated in the State, gap in the sewage treatment and timelines to bridge the gap including strategy for use of treated water for secondary purpose. Further, with regard to restoration of 351 polluted river stretches, the States need to furnish information about the compliance of directions including in-situ and ex-situ remediation by way of phyto-remediation/artificial wetlands, bio-diversity parks or any other appropriate measure to supplement load reduction on recipient river systems.

With respect to serial no. (iii), the Chief Secretaries need to monitor and compile information on the subject of execution of action plans for containment of air pollution in terms of orders of this Tribunal and furnish the quantifiable progress/achievement to the CPCB.

13. In view of above, CPCB needs to redesign formats and secure relevant quantifiable information from the Chief Secretaries under different heads so that the Chief Secretaries are able to respond to the Tribunal on their appearance as per schedule of appearance already notified. Chairman and Member Secretary, CPCB may remain present on the dates of appearance of Chief Secretaries with relevant data.

14. The regime of compensation in terms of earlier directions will be considered after interaction with the Chief Secretaries."

IV. RECENT ORDERS OF THE HON'BLE SUPREME COURT DATED 25.11.2019 AND 13.01.2020 HAVING BEARING ON THE MATTER (M.C. Mehta vs. Union of India, W.P. No. 13029/1985):

22. The Hon'ble Supreme Court vide order dated 25.11.2019⁴⁸ while dealing with the pollution in Delhi and NCR held:

⁴⁸ Writ Petition(s)(Civil) No(s). 13029/1985, M.C. Mehta Vs. Union of India & Ors.

“4. We see Yamuna river virtually turned into a sullage. We take judicial notice of this situation. Similar is the position with Ganges. As it proceeds, industrial effluents are being poured in rivers. **Sewage is also being directly put in rivers contributing to the river water pollution.** We direct the Pollution Control Boards of the various States as well as the Central Pollution Control Board and various Governments to place before us the data and material with respect to various rivers in the concerned States, and what steps they are taking to curb the pollution in such rivers and to management as to industrial effluents, **sewage, garbage, waste and air pollution, including the water management.** We club the pending case of water management with this matter.

10. As we have noted that from last several years, the position of air pollution is worsening in spite of various orders passed by this Court. The reports and the scientific data indicating that large section of people are suffering from the dreaded diseases due to such air pollution such as Cancer, Asthma and various other diseases. Life span is adversely affected. **Time has come that the various States recognise right to life is important right. Human life and health have been put in danger.** In such scenario, why they should not be required to pay compensation to such persons who are being affected by inadequate arrangement to check the **air pollution, non-lifting of garbage, waste which add ultimately to the pollution.**

11. In this case we find that Delhi is lacking the capacity to the extent of 45% to even clean the garbage/waste which is being generated. Similar is the situation in various other places. We take note of the situation which is alarming and time has come to remind the State machineries as to their duties as all of us are meant to serve the people of this great country. Our Constitution has envisaged certain Directive Principles as they are more important rights at the discretion of the Government. The Courts are not to interfere in that, but dereliction cannot be to the extent that the very right to life is endangered by the inaction.

13. Not only the basic Fundamental Rights are being ignored with respect to air and water, **problem of governance are being projected, which cannot come into the way of the basic Fundamental Rights which a human enjoys,** much less to talk of the Fundamental Duties and Directive Principles contained in the State policy which have already found statutory expression in the form of Municipal laws, Prevention of Air Pollution and Water Acts and various schemes framed by the Central Government and State Governments, but we see neither the air quality has improved nor the water quality in several States, not to talk of Delhi only. We have called for the report from Delhi Government where the reports indicate that the contaminated water is being supplied and also from Bureau of Indian Standards to submit report in this regard.

15. At the same time, as we find that in spite of various orders passed by this Court, we are not able to improve the situation of air quality which we can see at least in Delhi and NCR with certainty. **Time has come to require the State Governments to explain**

why they should not be asked to compensate the persons who are being affected by bad air quality. Obviously, the State is run by the administration, why liability should not be imposed for such a tort on the concerned machinery also of the various States which are failing to discharge their basic duties. This Court in *Municipal Council, Ratlam Vs. Vardhichand & Ors.*, reported in (1980) 4 SCC 162 has held they have to take proper and positive action in this direction. **It is their bounden duty to provide civic amenities, and also to see that self-created bankruptcy does not come in the discharge of the statutory obligation which are necessary for existence of human life.** We have seen during the course of the arguments that one State is passing the burden upon the Centre and then it is stated on behalf of the Central Government that they have framed scheme and it for the State Governments to implement it. We expect not only the 'policy making' but also its 'implementation'. Let the States of Punjab, Haryana, Uttar Pradesh and the Government of NCT of Delhi respond, due to the air pollution, why the concerned Government and its concerned machinery, from top to bottom, should not be asked to compensate the citizens of Delhi and adjoining areas for various diseases which are being caused and sufferings and troubles which are being faced and the report indicates the life span is being shortened. Let show cause notice be issued to the various State Governments, and to the Chief Secretaries, to submit reply within six weeks. Let the matter be listed for consideration on 17.01.2020. The Chief Secretaries to the States of Punjab, Haryana, Uttar Pradesh and Government of NCT of Delhi be personally present on that date."

23. Again, in the above matter, the Hon'ble Supreme Court vide order dated 13.01.2020 observed:

"56 (F). With respect to waste burning **compliance of Solid Waste Management Rules, 2016 is necessary.** The waste segregation and management is required, what are the existing facilities and deficit requirements have to be met by the Government of NCT of Delhi, Haryana, Uttar Pradesh, Rajasthan and Punjab.

57. (xviii). Let the Government of NCT of Delhi work out the details with respect to 45% deficit capacity to lift the garbage and waste as there is only 55% capacity available with respect to garbage and waste generated in Delhi. **Let it work out at a comprehensive plan within three months to have full (100%) capacity to deal with garbage and wastes** and place it before this Court, including the implements, tools, manpower and the expenditure required in that connection.

(xxi). We direct the various State Governments through **Chief Secretaries to inform this Court about the measures taken by them with respect to pouring of sewage** and untreated industrial effluents in various rivers and the plan prepared by them and arrangement of **funds made by them for the purpose of**

sewage treatment plants and existing facilities and requirements be pointed out within eight weeks.

(xxii). Let the Government of NCT of Delhi and Governments of Punjab, Haryana and UP show cause why they should not be saddled with the compensation for failure of their machinery and the concerned authorities in taking appropriate steps to prevent stubble burning and other pollution being caused."

V. 25TH REPORT DATED 12.02.2019 OF THE STANDING COMMITTEE ON URBAN DEVELOPMENT, 16TH LOK SABHA ON THE ISSUE OF SOLID WASTE MANAGEMENT INCLUDING HAZARDOUS WASTE, MEDICAL WASTE AND E-WASTE:

24. The Standing Committee on Urban Development, 16th Lok Sabha in its 25th Report dated 12.02.2019 considered the issue of solid waste management including hazardous waste, medical waste and e-waste and observed:

*"It is estimated that about **65 million tonnes of waste is generated annually** in the country out of which about 62 million tonnes is Municipal Solid Waste (MSW) which include organic waste, recyclables like paper, plastic, wood, glass etc. About 45-50% of this MSW is biodegradable/wet/organic waste, 20-25 % is recyclable waste & about 30-35% is inert/debris.*

*1.2 Only about 75-80% of the municipal waste gets collected and out of this only **22- 28% is processed and treated and remaining is deposited indiscriminately at dump yards.** It is projected that by the year 2031, the MSW generation shall increase to 165 million tonnes and to 436 million tonnes by 2050. **Eliminating, dumping and minimizing releases of hazardous chemicals by paying special attention to air quality and municipal and other waste management and reducing waste generation through prevention, reduction, recycling and reuse globally have been one of the Sustainable Development Goals (SDGs) that have been adopted by UN General Assembly in September, 2015.***

*1.3 It has been estimated that the Urban Local Bodies (ULBs) spend about 60-70% of total expenditure on street sweeping, 20-30% on transportation and less than 5% on municipal disposal of waste, which shows that hardly any attention is given to scientific disposal of waste. The waste collection efficiency in India ranges between 70% and 90% in major Metro cities, whereas in several smaller cities it is below 50%. However, if the current 62 million tones annual generation of MSW continues to be dumped without treatment; it will need 3.40 lakh cubic meter of landfill space every day. Considering the projected waste generation of 165 million tonnes by 2031, **the requirement of land for setting up landfill for 20 years (considering 10 meter high waste pile)***

could be as high as 66 thousand hectares (1240 hectare per year) of precious land, which our country cannot afford to waste. Currently, of the estimated 62 million tonnes of MSW generated annually by 377 million people in urban areas, more than 80% is disposed of indiscriminately at dump yards in an unhygienic manner by the municipal authorities leading to problems of health and environmental degradation.

1.4 As per NITI Aayog, presently, out of the total MSW generated, only 29.51% is subjected to treatment which, however, is poised to improve with the Swachh Bharat Mission (Urban) scheme of Government of India being in full swing.”

VI. FURTHER CONSIDERATION OF THE MATTER IN TODAY’S HEARING:

25. Accordingly, we have considered the matter further after interaction with the Chief Secretary, Telangana, Chairman and Member Secretary, CPCB. Even though all the thematic areas of the environment are significant, interaction has been limited to few selected themes, other themes being left to be considered separately on different scheduled hearings.
26. As per available statistics, there is huge gap in generation and treatment of solid and liquid waste in the country. **As per CPCB report 2016 (06.12.2016), as against 61948 MLD sewage generated in urban areas in India, the treatment capacity is 23277 MLD. The deficit in capacity is 62%.** There is no data of sewage generation in rural areas. **As per CPCB estimate of solid waste⁴⁹, about 65 million tonnes of waste is generated annually in the country out of which about 62 million tonnes is Municipal Solid Waste (MSW). Only about 75-80% of the municipal waste gets collected and out of this only 22- 28% is processed and treated and remaining is deposited indiscriminately at dump yards. It is projected that by the year 2031, the MSW generation**

⁴⁹ http://164.100.47.193/lsscommittee/Urban%20Development/16_Urban_Development_25.pdf

shall increase to 165 million tonnes and to 436 million tonnes by 2050. There are more than 4000 dump sites as per CPCB data⁵⁰ which need to be remediated to avoid harmful impact on environment and public health.

27. All the States/UTs were directed by this Tribunal to commence remediation of legacy waste sites by 01.11.2019⁵¹. The Tribunal observed:

“28. We are conscious that the SWM Rules provide for a maximum period of upto five years for the purpose, however there is no reason why the same should not happen earlier, in view of serious implications on the environment and public health⁵².”

*“30. Needless to say that potential hazard of dumpsites on public health and environment is more or less on the same pattern and earliest such dumpsites are cleared, sooner it is better for public health. **Such dumpsites are undoubted source of air pollution resulting in respiratory and other diseases. Most vulnerable are the infants and the senior citizens.** The right to breathe fresh air being part of right to life, delay in remedying the situation is not desirable. The plea of capping is being put forward on the ground of need for urgent remedial action, ignoring that doing so will perpetuate the adverse consequences of retaining non-biodegradable and other polluting components in the garbage eventually causing continuous damage to the soil and the ground water. Biological solutions have to be preferred over engineering solutions on the subject. However action has to be taken fast. Delay which has taken place so*

⁵⁰ Order dated 18.10.2019 in O.A. No. 606/2018 para 6

⁵¹ Order dated 17.07.2019 O.A. No. 519/2019 Para 28

⁵² (a) What a Waste 2.0, Global Snapshot of Solid Waste Management to 2050, World Bank Group, ISBN (paper): 978-1-4648-1329-0, 2018 International Bank for Reconstruction and Development / The World Bank, <http://datatopics.worldbank.org/what-a-waste/>. The report states- When waste is burned, the resulting toxins and particulate matter in the air can cause respiratory and neurological diseases, among others (Thompson 2014). Piles of waste produce toxic liquid runoff called leachate, which can drain into rivers, groundwater, and soil. Organic waste entering waterways reduces the amount of oxygen available and promotes the growth of harmful organisms (Bhada-Tata and Hoornweg 2016). Marine pollution is also increasing as a result of mismanaged solid waste on land, poor disposal practices by sea vessels, and runoff from sewage and polluted streams.

(b) <https://www.epw.in/engage/article/institutional-framework-implementing-solid-wastemanagement-india-macro-analysis> Several studies have been published that link asthma, heart attack, and emphysema to burning garbage. Human faecal matter is also frequently found in

municipal waste—this, along with unmanaged decomposed garbage, attracts other rodents, that further lead to a spread of diseases such as dengue and malaria. Leachate from rotten garbage contains heavy metals and toxic liquid; with such emissions ending up either absorbed into the soil or flowing into water bodies today (Awasthi 2013), the entire food chain can be affected when this contaminated water is utilised for agriculture, human consumption and animal consumption.

far is on account of inaction of the concerned authorities for which there is no justification.

*31. It will also be appropriate to note that the scheme of the SWM Rules is to prevent collection of waste and instead, to ensure its segregation, treatment and disposal at the earliest and as far as possible at the source itself. **If it is not done, the waste continues to be accumulated which becomes a challenge for the environment and public health. In this regard particular reference may be made to Rule 15 (zi). The authorities need to evolve a holistic strategy for integrated waste management in the municipal planning which may result in 'zero waste' going to the landfill in terms of the said rules***⁵³.

35. A copy of this order be sent to CPCB, all the Chief Secretaries, the MoEF&CC and MoHUA."

28. The issue of solid and liquid waste needs to be taken seriously. We have already mentioned the available statistics on the subject. It is a matter of serious concern that legacy waste remediation has not even commenced at most of the sites even though statutory rules contemplate outer limit for completion of such remediation by 07.04.2021. Current processing of the waste generated and collected is also not taking place on regular basis. For any person travelling by train, hot spots of scattered garbage and overflowing sewage are common sights. Satisfactory sewage management also remains far cry. This unsatisfactory state of affairs must be remedied at the earliest and in a time bound manner by initiative at the highest level. Accountability needs to be fixed and consequences for failure clearly provided and enforced.

29. Before coming to the data of State of Telangana, we may refer to recent orders passed in respect of some other States which may be relevant. On 10.01.2020, after interaction with the Chief Secretaries

⁵³ Reference may also be made to- Suggestive /Indicative "The National Action Plan for Municipal Solid Waste Management", Central Pollution Control Board, https://cpcb.nic.in/uploads/MSW/Action_plan.pdf.

of UP, Punjab, Advisor to Administrator for UT Chandigarh, this Tribunal issued direction fixing timelines for compliance of the Rules and other environmental norms and consequences for non-compliance. The said directions were conveyed to all the States/UTs/Local Bodies. We propose to issue similar directions in the present case.

30. Further reference may be made to order dated 24.01.2020 in O.A. No. 606/2018 while dealing with the State of Maharashtra. As per data furnished in the said case, it was mentioned that bio mining had commenced at 117 dump sites while 23 dump sites had already been cleared. This information is being mentioned to show that legacy waste remediation process can start simultaneously at all places where such legacy waste dump sites exist. We were informed that the State of Maharashtra approved a standard DPR at State level itself which may need to be considered by all concerned.
31. We may now note State specific scenario for Telangana as depicted in the earlier orders of this Tribunal when the Chief Secretaries appeared and as emerging from the data now made available by CPCB based on information furnished by the State to CPCB.

I. **Data noted in the earlier orders of this Tribunal:**

A. **STATE OF TELANGANA**

RULES	DATA
Solid Waste Management	Number of towns to be covered: 73 Local Bodies: 73 Waste Generation:7804 TPD Collected: 7023TPD Treated : 4795 TPD Landfilling : 593 TPD No. of Dumpsites :73
Plastic Waste Management	Waste Generation :250171 No. of registered Manufacturing Units: 209 No. of Unregistered Manufacturing Units: Nil

Biomedical Waste Management	No of Hospitals : 4200 Authorizations granted: 1633 Waste Generation : 15719 kg/d Treatment : 15719 kg/d Common Bio-medical waste Treatment Facilities : 11 No. of Captive Facilities : Nil
Polluted River Stretches	P(I)- 1 Musi P(II)- 2 Manjeera, Nakkavagu P(III)- 2 Karakavagu, Maner P(IV)- 2 Godavari, Kinnersani P(V)- 1 Krishna Total -8
Air Quality Management	non-attainment cities: Hyderabad, Patnacheruvu, Nalgonda
Industrial clusters	Patanacheru-Bollaram, Kattedan, Kukatpally
ETPs CETPs and STPs	ETPs No. of industries which require ETP : 2195 No. of industries having functional ETP: 2110 No. of industries complying : 1979 No. of industries non-complying: 131 STPs No. of STPs : 372 No. of STPs complying : 306 No. of STPs non-complying: 66 No. of under construction/proposed STPs :215 CETPs No. of CETPs : 7 No. of CETPs complying :5 No. of CETPs non-complying:2 No. of under construction/proposed CETPs in the State: 1

II. Data now made available during the hearing by the CPCB by way of presentation based on the data furnished by the State of Telangana alongwith its observations:

A. STATE OF TELANGANA

(i) Solid waste management including legacy waste.

STATUS OF SOLID WASTE MANAGEMENT				
Total No. of ULBs: 140				
MSW generated (TPD)	MSW Processed (TPD)	MSW Landfill (TPD)	Gap (TPD)	Timeline
10073	6425? (4698)	869	4506 (2779 ?)	Not provided

Assessment of SWM Facilities (capacity wise)

All units in TPD	Required Capacity	Existing capacity	Gap (TPD)	Proposed Capacity	Time frame	Observations
Waste Segregation Facility (MRF)	5339 (@53%)	Not provided	Not provided	Not provided	Not provided	Existing/Proposed capacity along with timeframe to be provided
Waste Processing						
Biodegradable waste (Bio-methanation and Composting)	4734 (@47%)	Composting - 2132 Bio-methanation-30	2572	4734	Not provided	Timeframe to be provided
Non biodegradable (Recycling; RDF, WtE Co-processing)	2820 (@28%)	RDF- 2400 Recycling-136	284	RDF:4500	Not provided	Timeframe to be provided
Waste Disposal (Landfill)	2518 (@25%)	869	1649	Not provided	Not provided	Target capacity along with timeframe to be provided.

Assessment of SWM Facilities (ULB wise)						
	Required	Existing	Gap	Proposed	Timeframe	Observations
Waste Segregation Facility (MRF)	140	111	29	All will be covered	Not provided	Presently all ULBs not covered
Biodegradable waste (Bio-methanation & Composting)	140	Composting :99 Bio-methnation:02	39	All will be covered	Not provided	Presently all ULBs not covered
Non-biodegradable (Recycling; WtE, RDF, Co-processing)	140	Recycling:140 RDF:1	0	WtE: 1	March 2020	--
Waste Disposal (Inert-Landfill)	140	1	139	Not provided	Not provided	All ULBs not covered

Legacy Waste	
	Present Status

1	Number of dumpsites	140
2	Quantity of Waste dumped at dumpsites	128 lacs MT
3	Number of dumpsites cleared	Not provided
4	Number of dumpsites in which bio-mining has commenced	2
5	Time frame for clearing all dumpsites	Not provided

During the presentation on behalf of the State, it was stated that reclamation of old dump at Jawahar Nagar at Hyderabad was being done by capping. The stand of the State is that bio-mining and bio-remediation can be done only for small size dump site and involves cost of Rs. 350 crore and period of three years and capping is permissible under clause J of Schedule-I to the Rules.

(ii) Sewage management and 351 polluted river stretches.

SEWAGE MANAGEMENT IN TELANGANA

TREATMENT CAPACITY					Remarks
Sewage Generation	Existing	Gap	Proposed	Timeline	Partial information
	917.55 MLD (35 STPs)	-	1000 MLD (39 STPs)	10 years	
SEWERAGE NETWORK					
Existing Sewerage Length	Required	Gap	Timelines		Information not provided
-	-	-	-		
NUMBER OF STPS					
Number of STPs	New proposed	Total STPs	Timeline		Partial information
35	-	35	-		
RE-USE OF TREATED SEWAGE					
Present Utilization	Proposed	Timelines	Type of Use		Information not Provided
-	-	-	-		

Restoration of Polluted River Stretches - O.A. NO 673/2018, Telangana

Priority Class	I	II	III	IV	V	Grand Total
No. of PRS	1	2	2	2	1	8

Polluted River Name	Polluted River Stretch	BOD Range/ Max Value (mg/l) (2016-2017 Data)	Priority
Musi	Hyderabad to nalgonda	4.0-60.0	I
Manjeera	Gowdicharla to nakkavagu	5.0-26	II
Nakkavagu	Gandilachapet to sevalal thanda	26.0	II
Karakavagu	Along palwancha	18.0	III
Maner	Warangal to somnapalli	6-20	III
Kinnersani	Along palwancha	10.0	IV
Godavari	Basar to khammam	4.0-9.0	IV
Krishna	Thangadigi to wadapally	5.0-6.0	V

Restoration of Polluted River Stretches - O.A. NO 673/2018, Telangana

Priority Class	No. of PRS	No. of RRC approved Action plans received	Date of Receipt of action plans	Action plans approved by CPCB Task Team subject to conditions	Remarks
I	1	1	29.01.2019	Action plan for P-I & P-II was approved in 3rd Task Team meeting held during 11-12th February, 2019.	RRC approved action plans for P-III to P-IV PRS will be examined in 10th Task Team meeting scheduled on 26 Feb.2020
II	2	2			
III	2	2		Target Date: 31.03.2020 (For P-III and P-IV)	
IV	2	2			
V	1	1			

Grand Total	8	8			

(iii) Air quality management in 122 non-attainment cities.

Status of Actions for Non attainment cities (NACs) in Telangana

Number of Non Attainment Cities	04 – Hyderabad, Patancheruvu, Nalgonda, Sangareddy
Action Plan approved	03 (Action plan for additional non-attainment city, Sangareddy under review)
Timelines for Actions	Short - term (within 3 months), mid - term(within one Year), and long - term (1-2 years).
CPCB comments	▪ Directions issued by CPCB for improving plans ✓ Source Apportionment and Carrying Capacity ✓ Interim Emission Reduction Targets ✓ Coordination with Central Agencies for implementation ✓ Consideration to Graded Response Action Plan (GRAP) ✓ District Level Monitoring Committee ▪ Micro level planning for each action in city plan ▪ Quarterly submission of implementation status ▪ Identify actions for domestic sources in Nalgonda

ANALYSIS:

Solid Waste Management:

32. We first consider the stand of the State for capping of the old dump site at Jawahar Nagar in Hyderabad. The stand is not legally and environmentally tenable. Capping will result in leachate remaining untreated affecting the ground water and gases in the dump site will remain unflared having potential for air pollution and hazardous for environment. Moreover, huge area of land which is scarce and valuable will be wasted. The cost involved will be far less than the

value of the land and need for protection of environment. It is also wrong to say that bio-mining or bio-remediation can be only of small size dump sites and not big dump sites. The size of the dump site is said to be 339 acres and the garbage is said to be 1.2 crore tonnes. We considered this aspect in the order dated 17.07.2019 in O.A. No. 519/2019. Therein three dump sites of Delhi, including Ghazipur with 1.4 crore tonne of garbage were involved. This Tribunal rejected the plea of the Corporation that bioremediation of bio-mining were not possible and only option was capping. It was observed:

“8. In O.A. No. 386/2019, the grievance raised was that unscientific capping process of the Bhalswa legacy waste dumpsites was against the SWM Rules and not conducive to the environment. This Tribunal, vide order dated 04.04.2019, sought opinion from a Committee comprising CPCB and Dr. G.K. Pandey, former Expert Member of this Tribunal, who is known to have expertise in the subject. Report dated 31.05.2019 has been submitted by the said Committee after visit to the Bhalswa site, visit to Bawana Waste Processing Plant and meeting with the North Delhi MC officers. Presentation was made before the said Committee by concerned officers of the North MCD as well as experts hired by the said Corporation. Some of the observations of the said Committee are as follows:

“3.5 The Cost indicated in the DPR for bioremediation is Rs.1178 Crores. However, as per CPCB Guidelines for Disposal of Legacy Waste, the cost of bioremediation and bio-mining of dumpsite is in the range of Rs.400- 700/Cum which works out in the range of Rs.440 - 560 Crore. The actual cost shall be further reduced, if cost of land recovered by means of bio-mining/bioremediation is factored in. Hence the cost indicated by NDMC seems to be very much on the higher side.

Similarly, the other issues raised by NDMC need detailed assessment.

*3.6 As per CPCB Guidelines, **capping of dumpsites is not advisable** as it would lead to generation of more leachates and methane/landfill gas generation which would further contaminate the already heavily contaminated Groundwater (Ground/surface water reports at Annexure VIII to X). Further as per CPCB Guidelines, gas extraction is very difficult and inefficient when attempts are made to insert suction pipes into dumped waste*

instead of before dumping begins. Poor success at Gorai capping led to the forced refund by Mumbai city of Rs.15 crore advance carbon credits. Taking into consideration the present height (65 m) of the landfill, extraction of leachate & gas will be even more difficult.

3.7 In addition, in the present tender documents, there is no provision for onsite treatment of leachates and utilization of gas generated as also decontamination of ground water/bio-remediation have not been envisaged in spite of the fact that ground and surface water are heavily polluted as reflected by analysis of ground water and surface water reports given in the DPR. The details of analysis reports are given below:

- (a) Table-I (Annexure-VIII) pertains to ground water sampling report of hand pumps which has indicated that average levels of BOD (2.4 mg/1), COD (28.0 mg/1), TDS (2783 mg/1) are more than the prescribed acceptable limit of zero for BOD, zero for COD and 500 mg/1 for TDS. Besides, the average high level of Residual Free Chlorine of 208.7 mg/1 (limit 0.2mg/l), Chlorides 769.7 mg/1 (limit 250 mg/1), Sulphate 228.2 mg/1 (limit 200mg/l), Alkalinity 508.7 mg/1 (limit 200 mg/1), Lead 0.2 mg/1 (limit 0.01 mg/1) and Nickel 0.1 mg/1 (limit 0.02mg/l) indicates that drinking water from the hand pumps has been significantly polluted and is not drinkable.
- (b) Table-2 (Annexure-IX) reflects ground water analysis report pertaining to 18 boreholes. The average levels of BOD (93.11 mg/1), COD (783.72 mg/1) and TDS (6841.83 mg/1) were found more as against the acceptable limit of zero for BOD, zero for COD and 500 mg/1 for TDS indicating that ground water has been significantly contaminated due to percolation of leachates from the landfill.
- (c) Table-3 (Annexure-X) pertains to analysis of surface water taken from Bhalsawa drain and Bhalsawa lake. The analysis report indicates that the average levels of BOD (68.40 mg/1), COD (547.51 mg/l) and TDS (4465.23 mg/l) were found higher as against the permissible limit for drinking water for BOD (0), COD (0) and TDS (500 mg/l) respectively indicating that surface water is significantly polluted due to discharge of untreated leachates. Besides, the average levels of residual free chlorine (179.60 mg/1, limit 0.2 mg/1), Iron (0.53 mg/1, limit 0.3), Chlorides (13119.04 mg/1, limit 250), Calcium (188.99 mg/1, limit 75), Alkalinity

(1285.96 mg/ l, limit 200), phenolic compound (0.07 mg/ l, limit 0.001), Lead (0.15 mg/ l, limit 0.01), Mercury (3.75 mg/ l, limit 0.001) and Nickel (0.15 mg/ l, limit 0.02) were found high indicating that surface water is very polluted and Bhalswa lake is not meeting the criteria for drinking water as toxic elements like phenolic compounds including heavy metals are present in the lake water. It is quite possible that the animals (buffalos, cows etc.) may be drinking lake water and as such the possibility of toxic chemicals and heavy metals entering the food chain cannot be over ruled. Therefore, lake water should not be used for drinking purposes by the human beings and the animals.

(d) Table-4(Annexure-XI) leachate emanating from the BLF indicates that BOD (500 mg/ l), COD (2279 mg/ l) & TDS (19000 mg/ l) levels are higher in comparison to leachate standards of BOD (30 mg/ l), COD (250 mg/ l) & TDS (2100 mg/ l) as prescribed in SWM Rules,2016.

3.8 There are various technologies available for treatment of MSW such as composting, bio-methanation, incineration coupled with power generation, gasification, pyrolysis, plasma arc gasification, molten salt oxidation (non-flame thermal process for destroying organic materials) etc.

4.0 Recommendations

- i. NDMC should do a detailed assessment of the alternative technological options including Bio-mining / Bio-remediation for Bhalswa dumpsite.
- ii. Niti Aayog has constituted a Committee to identify the technologies in Solid Waste Management for Cleaning up of Delhi (Annexure XII). NDMC may consider the outcome of this committee's report in assessing options for Remediation of Bhalswa dumpsite.
- iii. In case, capping of Bhalswa Dumpsite (which is not advisable as per CPCB Guidelines as mentioned at point 3.6 above) is proposed as the only option due to time and space constraints as also technoeconomic reasons, the DPR should be revisited especially to look into the following conditions:
 - (a) Bio-mining should be undertaken to the maximum extent possible without having significant adverse environmental impacts on the adjoining population.
 - (b) Bio-remediation/decontamination of surface, ground water and soil should also be undertaken in the affected areas.

(c) No dumping of MSW/Garbage (about 2000 tons/day) shall be done at Bhalswa dumpsite and alternate arrangements for disposal of this waste to be made by NDMC on priority in accordance with S WM Rules, 2016.”

9. We may note that as per information furnished during the hearing, the extent of legacy waste and the land covered by the three dump sites are as follow:

- i. East Delhi Ghazipur dumpsite- 1.4 crore metric tonne approx. on 70 acres of land
- ii. North Delhi Bhalswa dumpsite - 80 lakh metric tonne approx. on 36 acres of land
- iii. South Delhi Okhla dumpsite – 55-60 lakh metric tonne approx. on 46 acres of land

10. Information made available from Indore Municipal Corporation is as follows:

“For screening purposes, trommels of 30 MT per hour capacities, are available in the market on rental basis. Necessary vehicles and equipments (like excavators, back-hoe loaders, dumpers, vibratory screens for dust removals and bundling machines for Refused Derived Fuel) are required for bio-mining and bio-remediation purposes. Normally, 20 trommels along with necessary machines and tools can process 5000 MT of legacy waste on daily basis in two shifts operation. Recently, Indore has successfully completed bio-mining/bio-remediation of 15 lakh MT legacy waste in 1 year. Rent for trommels paid by Indore to various machine manufacturers were in tune of Rs. 7.25 Lakh per trommel per month and bio-mining/bio-remediation process was followed as mentioned in the latest guidelines issued by the CPCB. Normally, the per metric ton cost of bio-remediation process of legacy waste will range between Rs. 300- 450 depending upon area to area.

In legacy waste sites where local bodies have space constraints can initially start the bio-mining/ bio-remediation options through mobile trommels.

Similarly, Ahmedabad Municipal Corporation has started the bio-mining/bio-remediation at Pirana dumping site and they are paying Rs. 6.40 Lakh per trommel per month.

The trommel machines are very simple in fabrication and can be fabricated as per the design mentioned in CPCB guidelines by local fabricators.

Instead of having multiple machines, it is advisable to have a single trommel of 16-20 MM bore size

screen and reject conveyer should have blower. This will reduce the cost due to multiple trommeling. Also, to utilise the Refused Derived Fuel ('RDF') recovered from this process should be made free from dust. Thereafter RDF can be bundled and sent to waste-to-energy plant and cement industries for further utilisation.

The recovered soil from the bio-mining/bio-remediation process can be used in filling the dead mines so as afforestation in the area can take place. Secondly, it can be used by National Highway Authorities/ State Road construction agencies and local bodies in sub-base filling.

Local bodies can install number of trommels at bio-remediation site based on availability of land and with time they can increase the number so as to complete the process as soon as possible.

Once the bio-mining and bio-remediation process starts, dumping of fresh garbage should be stopped at the legacy waste dumpsites, local bodies may identify a separate piece of land to process the fresh garbage through various processes mentioned in Municipal Solid Waste Management Rules, 2016 and guidelines issued by the CPCB.”

11. In-Charge, Member Secretary, CPCB has similar view. Chief Secretary, Delhi suggests that a functional model may be preferred to any other option which has not been experienced on the ground.
12. We find merit in the model followed by Indore Municipal Corporation, the views of Member Secretary, CPCB and the Chief Secretary, Delhi. This opinion is also in consonance with the SWM Rules as well as the CPCB Guideline on Legacy Waste⁵⁴ and recent orders of this Tribunal. A conjoint reading of Rule 15 (zj), Rule 15(zk) and Clause J of Schedule I of the SWM Rules leaves room for capping of old dump sites, only in cases where there is “absolute absence of potential of bio-mining and bio-remediation” and not in cases of present nature where bio-mining and bio-remediation is possible. In cases of present nature, both ex-situ and in-situ bio-mining options can be exercised according to Indore Municipal Corporation, which is not only environmentally safe but cost effective. Though plea for capping legacy waste dumpsites is being raised frequently as a convenient mode, there may be hardly any situation when bio-remediation is not possible. The option of capping of legacy wastes, which has huge environmental and health consequences, in practical terms is no option at all, except for inert waste, which again is to be disposed in a scientific

⁵⁴ Guidelines for Disposal of Legacy Waste (Old Municipal Solid Waste), Central Pollution Control Board, February 2019

secured landfill. According to Indore Municipal Corporation, bio-mining as a treatment option is environmentally safe and does not require recurrent costs on account of leachate treatment in Effluent Treatment Plant (ETP). Furthermore, only peripheral leachate can be taken to the ETP and leachate percolating underneath the dumpsite contaminates ground water and water in subterranean space. Bio-mining as a treatment option in comparison to engineering capping of legacy wastes, is not only environmentally safe and holistic but also meets the yardstick of fiscal prudence and propriety.”

33. Applying the above principle to the present case, we reject the plea of the State and direct that instead of capping of the dump site, it is imperative to do bio-mining and bioremediation in the interest of environment and to save valuable scarce public resource in the form of land. The land can be used for setting up integrated waste processing facilities and developing green belt or bio-diversity park. If the State/Corporation does not have funds, the State may consider monetizing a part of the land to raise revenue for the purpose, after following due process of law. In any case, capping cannot be permitted.

34. We find that steps taken for legacy waste remediation are not adequate. The work has not even commenced at 138 out of 140 sites which is a matter of serious concern. The timeline needs to be consistent with the statutory rules as well as the orders of this Tribunal. The timeline 2025 proposed by the State of Telangana needs to be preponed accordingly.

35. There remains gap of 4506 TPD for Telangana in terms of current generation and treatment of solid waste which is endangering environment, adversely affecting public health and posing serious threat to life. No firm commitment to remedy the gap consistent with the statutory Rules specially the timelines has been put forth, as

expected in terms of directions of the Hon'ble Supreme Court and this Tribunal. Thus, suitable remedial measures need to be adopted in the matter.

Sewage Management:

36. As regards sewage management, there is a huge gap in sewage treatment. In the context of river pollution alone, gap is reported to be 1253.93 MLD. Actual gap in generation and treatment capacity has not been given. We can only observe that the entire gap needs to be remedied in terms of directions already issued by this Tribunal. The timeline proposed for bridging the gap between sewage generation and treatment needs to be preponed with interim arrangement by way of phyto/bio- remediation. Discharge of untreated sewage is statutorily prohibited under the provisions of the Water Act, 1974 as well as under the orders of this Tribunal. Untreated waste water and raw sewage being continuously discharged in water bodies needs to be stopped. As already observed, prompt action needs to be taken to reduce pollution load on recipient river systems by way of phyto-remediation/bio-remediation of any other alternative low capital-intensive natural remediation processes and to successfully tap the sewage containing storm water drains so as to channelize the untreated sewage to central STP. Phytoremediation/bio-remediation or other such remediation must commence at or nearest the source of generation as a supplement to setting up of STPs as an interim measure to reduce the load of pollution on recipient water bodies before 31.03.2020. Setting up of STPs must also commence before the said date so as to complete the same by 31.03.2021. In this regard, compensation regime has already been laid down which has

to be strictly followed. The timelines and compensation regime already laid down are:

- i. Interim measures for phytoremediation/ bioremediation etc. in respect of 100% sewage to reduce the pollution load on recipient water bodies – 31.03.2020. Compensation is payable for failure to do so at the rate of Rs. 5 lakh per month per drain by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2020.
- ii. Commencement of setting up of STPs – 31.03.2020. Compensation is payable for failure to do so at the rate of Rs. 5 lakh per month per STP by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2020.
- iii. Commissioning of STPs – 31.03.2021. Compensation is payable for failure to do so at the rate of Rs. 10 lakh per month per STP by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2021.

37. The Chief Secretary mentioned that the central assistance was inadequate which cannot be a justification for failure of the State in managing its waste. Waste management is responsibility of the State and Local Bodies, as already held by the Hon'ble Supreme Court in the judgments referred to above. If the funds available are inadequate, the State has to raise the same from the generators of waste.

38. The Chief Secretary must ensure adverse entries in the service records of erring officers in respect of liquid waste management atleast from 01.04.2020.

Likewise, remediation work of legacy dump sites must commence at the earliest and adverse entries in ACRs of concerned officers if the remediation does not commence by 31.03.2020 which may be ensured by the Chief Secretary.

To save time, standard specifications and service providers must be notified by the Chief Secretary on the websites of the State/UT within one month from today. The Chief Secretary may take such opinion as may be necessary for the purpose.

Compliance reports may be filed quarterly and first such report may be filed by 31.03.2020 with a copy to the CPCB. CPCB may furnish gap analysis report.

Restoration of Polluted River Stretches:

39. Similarly, with regard to restoration of polluted river stretches, the execution of action plans is required in right earnest and holistic manner. Considering that implementation requires inter-sectoral consideration and there is a need for a robust institutional mechanism to implement it, this needs to be overseen by the Chief Secretary.

Air Quality Management:

40. With regard to air quality management in non-attainment cities, execution of action plans has to be duly ensured as per laid down timelines by making adequate budgetary provision in accordance with the orders of this Tribunal by clearly defined monitoring and enforcement strategies and fixing responsibilities for failures on the officers. Absence of due execution of action plans is worsening the situation on account of resultant pollution. The execution of action plan needs to be supervised by the Chief Secretary of the State.

VII. DIRECTIONS:

41. In view of above, consistent with the directions referred to in Para 29 issued on 10.01.2020 in the case of UP, Punjab and Chandigarh which have also been repeated for other States in matters already dealt with, we direct:

a. In view of the fact that most of the statutory timelines have expired and directions of the Hon'ble Supreme Court and this Tribunal to comply with Solid Waste Management Rules, 2016 remain unexecuted, compensation scale is hereby laid down for continued failure after 31.03.2020. The compliance of the Rules requires taking of several steps mentioned in Rule 22 from Serial No. 1 to 10 (mentioned in para 12 above). Any such continued failure will result in liability of every Local Body to pay compensation at the rate of Rs. 10 lakh per month per Local Body for population of above 10 lakhs, Rs. 5 lakh per month per Local Body for population between 5 lakhs and 10 lakhs and Rs. 1 lakh per month per other Local Body from 01.04.2020 till compliance. If the Local Bodies are unable to bear financial burden, the liability will be of the State Governments with liberty to take remedial action against the erring Local Bodies. Apart from compensation, adverse entries must be made in the ACRs of the CEO of the said Local Bodies and other senior functionaries in Department of Urban Development etc. who are responsible for compliance of order of this Tribunal.

b. Legacy waste remediation was to 'commence' from 01.11.2019 in terms of order of this Tribunal dated 17.07.2019 in O.A. No. 519/2019 para 28⁵⁵ even though statutory timeline for 'completing' the said step is till 07.04.2021 (as per serial no. 11 in Rule 22), which direction remains unexecuted at most of the places. Continued failure of every Local Body on the

⁵⁵ The Chief Secretaries may ensure allocation of funds for processing of legacy waste and its disposal and in their respective next reports, give the progress relating to management of all the legacy waste dumpsites. Remediation work on all other dumpsites may commence from 01.11.2019 and completed preferably within six months and in no case beyond one year. Substantial progress be made within six months. We are conscious that the SWM Rules provide for a maximum period of upto five years for the purpose, however there is no reason why the same should not happen earlier, in view of serious implications on the environment and public health.

subject of commencing the work of legacy waste sites remediation from 01.04.2020 till compliance will result in liability to pay compensation at the rate of Rs. 10 lakh per month per Local Body for population of above 10 lakhs, Rs. 5 lakh per month per Local Body for population between 5 lakhs and 10 lakhs and Rs. 1 lakh per month per other Local Body. If the Local Bodies are unable to bear financial burden, the liability will be of the State Governments with liberty to take remedial action against the erring Local Bodies. Apart from compensation, adverse entries must be made in the ACRs of the CEO of the said Local Bodies and other senior functionaries in Department of Urban Development etc. who are responsible for compliance of order of this Tribunal.

c. Further, with regard to thematic areas listed above in para 20, steps be ensured by the Chief Secretaries in terms of directions of this Tribunal especially w.r.t. plastic waste, bio-medical waste, construction and demolition waste which are linked with solid waste treatment and disposal. Action may also be ensured by the Chief Secretaries of the States/UTs with respect to remaining thematic areas viz. hazardous waste, e-waste, polluted industrial clusters, reuse of treated water, performance of CETPs/ETPs, groundwater extraction, groundwater recharge, restoration of water bodies, noise pollution and illegal sand mining.

d. The compensation regime already laid down for failure of the Local Bodies and/or Department of Irrigation and Public Health/In-charge Department to take action for treatment of sewage in terms of observations in para 36 above will result in liability to pay compensation as already noted above which are reproduced for ready reference:

i. Interim measures for phytoremediation/bioremediation etc. in respect of 100% sewage to reduce the pollution load on recipient water bodies – 31.03.2020. Compensation is payable for failure to do so at the rate of Rs. 5 lakh per month per drain by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2020.

- ii. Commencement of setting up of STPs – 31.03.2020. Compensation is payable for failure to do so at the rate of Rs. 5 lakh per month per STP by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2020.
- iii. Commissioning of STPs – 31.03.2021. Compensation is payable for failure to do so at the rate of Rs. 10 lakh per month per STP by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2021.
- e. Compensation in above terms may be deposited with the CPCB for being spent on restoration of environment which may be ensured by the Chief Secretaries' of the States/UTs.
- f. An 'Environment Monitoring Cell' may be set up in the office of Chief Secretaries of all the States/UTs within one month from today, if not already done for coordination and compliance of above directions which will be the responsibility of the Chief Secretaries of the States/UTs.
- g. Compliance reports in respect of significant environmental issues may be furnished in terms of order dated 07.01.2020 quarterly with a copy to CPCB.

The Chief Secretary, Telangana may remain present in person for further review tentatively on 25.09.2020.

A copy of this order be sent to the Chief Secretary, Telangana and the CPCB by e-mail.

Adarsh Kumar Goel, CP

S.P Wangdi, JM

Dr. Nagin Nanda, EM

Siddhanta Das, EM

February 14, 2020
Original Application No. 606/2018
DV



IN THE SUPREME COURT OF INDIA

CIVIL APPELLATE JURISDICTION

CIVIL APPEAL NO(S). _____ OF 2020
(@ Diary No(s).11490/2020)

THE GREATER HYDERABAD MUNICIPAL
CORPORATION & ANR.

Appellant(s)

VERSUS

CENTRAL POLLUTION CONTROL BOARD

Respondent(s)

O R D E R

Mr.V. Giri, learned senior counsel appearing for the appellants submits that there are certain issues which have not been considered by the National Green Tribunal(NGT).

Learned senior counsel seeks and is granted permission to withdraw this appeal with liberty to approach the NGT by filing an application for review of the Order dated 14.2.2020 passed by the NGT in Original Application No.606 of 2018.

Signature Not Verified
Digitally signed by
GEETA AHUJA
Date: 2020.06.17
16:31:09 IST
Reason: 

Liberty is given to the Appellants to approach this Court in case of dismissal of the review by challenging the order dated 14.02.2020 as well.

The appeal is, accordingly, dismissed as
withdrawn with the aforesaid liberty.

.....J.
(L. NAGESWARA RAO)

.....J.
(S. RAVINDRA BHAT)

NEW DELHI,
JUNE 15, 2020

ITEM NO.11

Virtual Court 6

SECTION XVII

S U P R E M E C O U R T O F I N D I A
R E C O R D O F P R O C E E D I N G S

CIVIL APPEAL Diary No(s).11490/2020

(Arising out of impugned final judgment and order dated 14-02-2020
in OA No.606/2018 passed by the National Green Tribunal)

THE GREATER HYDERABAD MUNICIPAL CORPORATION & ANR. Appellant(s)

VERSUS

CENTRAL POLLUTION CONTROL BOARD

Respondent(s)

(FOR ADMISSION and I.R. and IA No.50773/2020-EXEMPTION FROM FILING
C/C OF THE IMPUGNED JUDGMENT and IA No.50771/2020-EX-PARTE STAY and
IA No.50776/2020-EXEMPTION FROM FILING AFFIDAVIT and IA
No.50769/2020-CONDONATION OF DELAY IN FILING APPEAL)

Date : 15-06-2020 This petition was called on for hearing today.

CORAM :

HON'BLE MR. JUSTICE L. NAGESWARA RAO
HON'BLE MR. JUSTICE S. RAVINDRA BHAT

For Petitioner(s) Mr. V.Giri,Sr.Adv.
 Mr. P. Venkat Reddy, Adv.
 Mr. Prashant Tyagi, Adv.
 Mr. P. Srinivas Reddy, Adv.
 M/S.Venkat Palwai Law Associates, AOR

For Respondent(s)

UPON hearing the counsel the Court made the following
O R D E R

The appeal is dismissed as withdrawn in terms of the
Signed Order.

(GEETA AHUJA)
COURT MASTER

(ANAND PRAKASH)
BRANCH OFFICER

(The Signed Order is placed on the file)

Item No. 01

Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

Review Application No. 02/2021
(with I.A. No. 31/2021 & I.A. No. 32/2021)

IN
Original Application No. 606/2018

**Compliance of Municipal Solid Waste Management Rules, 2016
(State of Telangana)**

The Greater Hyderabad Municipal
Corporation, Hyderabad & the State of Telangana: Review Applicants

Date of hearing: 18.02.2021

**CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER**

IN CHAMBER BY CIRCULATION

ORDER

1. This review application has been filed by The Greater Hyderabad Municipal Corporation and State of Telangana for review of order dated 14.02.2020. The said order was passed in the presence of the Chief Secretary, Telangana accompanied by other senior officers and Chairman and Member Secretary of CPCB.

2. The grievance in the review application is primarily against the direction not to cap the legacy waste and instead to undertake biomining for compliance of Solid Waste Management Rules, 2016. According to the review applicants, capping work of Jawahar Nagar dump site had commenced prior to 2016 Rules when technology options of biomining were not in contemplation. Accordingly, at the said site in terms of Integrated Solid Waste Management Project a detailed DPR with Rs. 500

crores as project cost was submitted to the Government of India and after approval and sanction of 50% funds under the JNNURM, global tenders were called and contract was given to M/s. Ramky Enviro Engineers Ltd. (M/s. REEL) which included reclamation of dump sites of Jawaharnagar, Fathullaguda, Gandhamguda and Shamshiguda. Work commenced and part of the land has already been reclaimed. **Scientific capping design was prepared by the international consultants and approved on 22.03.2018.**

3. The issue has been duly considered in the order of this Tribunal dated 14.02.2020 as follows:

“32. We first consider the stand of the State for capping of the old dump site at Jawahar Nagar in Hyderabad. The stand is not legally and environmentally tenable. Capping will result in leachate remaining untreated affecting the ground water and gases in the dump site will remain unflared having potential for air pollution and hazardous for environment. Moreover, huge area of land which is scarce and valuable will be wasted. The cost involved will be far less than the value of the land and need for protection of environment. It is also wrong to say that bio-mining or bio-remediation can be only of small size dump sites and not big dump sites. The size of the dump site is said to be 339 acres and the garbage is said to be 1.2 crore tonnes. We considered this aspect in the order dated 17.07.2019 in O.A. No. 519/2019. Therein three dump sites of Delhi, including Ghazipur with 1.4 crore tonne of garbage were involved. This Tribunal rejected the plea of the Corporation that bioremediation of bio-mining were not possible and only option was capping. It was observed:

“8. In O.A. No. 386/2019, the grievance raised was that unscientific capping process of the Bhalswa legacy waste dumpsites was against the SWM Rules and not conducive to the environment. This Tribunal, vide order dated 04.04.2019, sought opinion from a Committee comprising CPCB and Dr. G.K. Pandey, former Expert Member of this Tribunal, who is known to have expertise in the subject. Report dated 31.05.2019 has been submitted by the said Committee after visit to the Bhalswa site, visit to Bawana Waste Processing Plant and meeting with the North Delhi MC officers. Presentation was made before the said Committee by concerned officers of the North MCD as well as experts hired by the said

Corporation. Some of the observations of the said Committee are as follows:

“3.5 The Cost indicated in the DPR for bioremediation is Rs.1178 Crores. However, as per CPCB Guidelines for Disposal of Legacy Waste, the cost of bioremediation and bio-mining of dumpsite is in the range of Rs.400- 700/Cum which works out in the range of Rs.440 - 560 Crore. The actual cost shall be further reduced, if cost of land recovered by means of bio-mining/bioremediation is factored in. Hence the cost indicated by NDMC seems to be very much on the higher side.

Similarly, the other issues raised by NDMC need detailed assessment.

3.6 As per CPCB Guidelines, **capping of dumpsites is not advisable as it would lead to generation of more leachates and methane/landfill gas generation which would further contaminate the already heavily contaminated Groundwater** (Ground/surface water reports at Annexure VIII to X). Further as per CPCB Guidelines, gas extraction is very difficult and inefficient when attempts are made to insert suction pipes into dumped waste instead of before dumping begins. Poor success at Gorai capping led to the forced refund by Mumbai city of Rs.15 crore advance carbon credits. Taking into consideration the present height (65 m) of the landfill, extraction of leachate & gas will be even more difficult.

3.7 In addition, in the present tender documents, there is no provision for onsite treatment of leachates and utilization of gas generated as also decontamination of ground water/bioremediation have not been envisaged in spite of the fact that ground and surface water are heavily polluted as reflected by analysis of ground water and surface water reports given in the DPR. The details of analysis reports are given below:

(a) Table-I (Annexure-VIII) pertains to ground water sampling report of hand pumps which has indicated that average levels of BOD (2.4 mg/l), COD (28.0 mg/l), TDS (2783 mg/l) are more than the prescribed acceptable limit of zero for BOD, zero for COD and 500 mg/l for TDS. Besides, the average high level of Residual Free Chlorine of 208.7 mg/l (limit 0.2mg/l), Chlorides 769.7 mg/l (limit 250 mg/l), Sulphate 228.2 mg/l (limit 200mg/l), Alkalinity 508.7

mg/1 (limit 200 mg/1), Lead 0.2 mg/1 (limit 0.01 mg/1) and Nickel 0.1 mg/1 (limit 0.02mg/l) indicates that drinking water from the hand pumps has been significantly polluted and is not drinkable.

- (b) Table-2 (Annexure-IX) reflects ground water analysis report pertaining to 18 boreholes. The average levels of BOD (93.11 mg/1), COD (783.72 mg/1) and TDS (6841.83 mg/1) were found more as against the acceptable limit of zero for BOD, zero for COD and 500 mg/1 for TDS indicating that ground water has been significantly contaminated due to percolation of leachates from the landfill.*
- (c) Table-3 (Annexure-X) pertains to analysis of surface water taken from Bhalsawa drain and Bhalsawa lake. The analysis report indicates that the average levels of BOD (68.40 mg/1), COD (547.51 mg/l) and TDS (4465.23 mg/l) were found higher as against the permissible limit for drinking water for BOD (0), COD (0) and TDS (500 mg/l) respectively indicating that surface water is significantly polluted due to discharge of untreated leachates. Besides, the average levels of residual free chlorine (179.60 mg/1, limit 0.2 mg/1), Iron (0.53 mg/1, limit 0.3), Chlorides (13119.04 mg/1, limit 250), Calcium (188.99 mg/1, limit 75), Alkalinity (1285.96 mg/1, limit 200), phenolic compound (0.07 mg/1, limit 0.001), Lead (0.15 mg/1, limit 0.01), Mercury (3.75 mg/1, limit 0.001) and Nickel (0.15 mg/1, limit 0.02) were found high indicating that surface water is very polluted and Bhalswa lake is not meeting the criteria for drinking water as toxic elements like phenolic compounds including heavy metals are present in the lake water. It is quite possible that the animals (buffalos, cows etc.) may be drinking lake water and as such the possibility of toxic chemicals and heavy metals entering the food chain cannot be over ruled. Therefore, lake water should not be used for drinking purposes by the human beings and the animals.*
- (d) Table-4(Annexure-XI) leachate emanating from the BLF indicates that BOD (500 mg/1), COD (2279 mg/1) & TDS (19000 mg/1) levels are higher in comparison to leachate standards of BOD (30 mg/1), COD (250 mg/1) & TDS (2100 mg/1) as prescribed in SWM Rules,2016.*

3.8 There are various technologies available for treatment of MSW such as composting, bio-methanation, incineration coupled with power generation, gasification, pyrolysis, plasma arc gasification, molten salt oxidation (non-flame thermal process for destroying organic materials) etc.

4.0 Recommendations

- i. NDMC should do a detailed assessment of the alternative technological options including Bio-mining / Bio-remediation for Bhalswa dumpsite.
 - ii. Niti Aayog has constituted a Committee to identify the technologies in Solid Waste Management for Cleaning up of Delhi (Annexure XII). NDMC may consider the outcome of this committee's report in assessing options for Remediation of Bhalswa dumpsite.
 - iii. In case, capping of Bhalswa Dumpsite (which is not advisable as per CPCB Guidelines as mentioned at point 3.6 above) is proposed as the only option due to time and space constraints as also technoeconomic reasons, the DPR should be revisited especially to look into the following conditions:
 - (a) Bio-mining should be undertaken to the maximum extent possible without having significant adverse environmental impacts on the adjoining population.
 - (b) Bio-remediation/decontamination of surface, ground water and soil should also be undertaken in the affected areas.
 - (c) No dumping of MSW/Garbage (about 2000 tons/day) shall be done at Bhalswa dumpsite and alternate arrangements for disposal of this waste to be made by NDMC on priority in accordance with S WM Rules, 2016.”
9. We may note that as per information furnished during the hearing, the extent of legacy waste and the land covered by the three dump sites are as follow:
- i. East Delhi Ghazipur dumpsite- 1.4 crore metric tonne approx. on 70 acres of land
 - ii. North Delhi Bhalswa dumpsite - 80 lakh metric tonne approx. on 36 acres of land
 - iii. South Delhi Okhla dumpsite – 55-60 lakh metric tonne approx. on 46 acres of land
10. Information made available from Indore Municipal Corporation is as follows:

“For screening purposes, trommels of 30 MT per hour capacities, are available in the market on rental basis. Necessary vehicles and equipments (like excavators, back-hoe loaders, dumpers, vibratory screens for dust removals and bundling machines for Refused Derived Fuel) are required for bio-mining and bio-remediation purposes. Normally, 20 trommels along with necessary machines and tools can process 5000 MT of legacy waste on daily basis in two shifts operation. Recently, Indore has successfully completed bio-mining/bio-remediation of 15 lakh MT legacy waste in 1 year. Rent for trommels paid by Indore to various machine manufacturers were in tune of Rs. 7.25 Lakh per trommel per month and bio-mining/bio-remediation process was followed as mentioned in the latest guidelines issued by the CPCB. Normally, the per metric ton cost of bio-remediation process of legacy waste will range between Rs. 300- 450 depending upon area to area.

In legacy waste sites where local bodies have space constraints can initially start the bio-mining/ bio-remediation options through mobile trommels.

Similarly, Ahmedabad Municipal Corporation has started the bio-mining/bio-remediation at Pirana dumping site and they are paying Rs. 6.40 Lakh per trommel per month.

The trommel machines are very simple in fabrication and can be fabricated as per the design mentioned in CPCB guidelines by local fabricators.

Instead of having multiple machines, it is advisable to have a single trommel of 16-20 MM bore size screen and reject conveyer should have blower. This will reduce the cost due to multiple trommeling. Also, to utilise the Refused Derived Fuel (‘RDF’) recovered from this process should be made free from dust. Thereafter RDF can be bundled and sent to waste-to-energy plant and cement industries for further utilisation.

The recovered soil from the bio-mining/bio-remediation process can be used in filling the dead mines so as afforestation in the area can take place. Secondly, it can be used by National Highway Authorities/ State Road construction agencies and local bodies in sub-base filling.

Local bodies can install number of trommels at bio-remediation site based on availability of land

and with time they can increase the number so as to complete the process as soon as possible.

Once the bio-mining and bio-remediation process starts, dumping of fresh garbage should be stopped at the legacy waste dumpsites, local bodies may identify a separate piece of land to process the fresh garbage through various processes mentioned in Municipal Solid Waste Management Rules, 2016 and guidelines issued by the CPCB.”

11. *In-Charge, Member Secretary, CPCB has similar view. Chief Secretary, Delhi suggests that a functional model may be preferred to any other option which has not been experienced on the ground.*
12. *We find merit in the model followed by Indore Municipal Corporation, the views of Member Secretary, CPCB and the Chief Secretary, Delhi. **This opinion is also in consonance with the SWM Rules as well as the CPCB Guideline on Legacy Waste¹ and recent orders of this Tribunal. A conjoint reading of Rule 15 (zj), Rule 15(zk) and Clause J of Schedule I of the SWM Rules leaves room for capping of old dump sites, only in cases where there is “absolute absence of potential of bio-mining and bio-remediation” and not in cases of present nature where bio-mining and bio-remediation is possible. In cases of present nature, both ex-situ and in-situ bio-mining options can be exercised according to Indore Municipal Corporation, which is not only environmentally safe but cost effective. Though plea for capping legacy waste dumpsites is being raised frequently as a convenient mode, there may be hardly any situation when bio-remediation is not possible. The option of capping of legacy wastes, which has huge environmental and health consequences, in practical terms is no option at all, except for inert waste, which again is to be disposed in a scientific secured landfill. According to Indore Municipal Corporation, bio-mining as a treatment option is environmentally safe and does not require recurrent costs on account of leachate treatment in Effluent Treatment Plant (ETP). Furthermore, only peripheral leachate can be taken to the ETP and leachate percolating underneath the dumpsite contaminates ground water and water in subterranean space. Bio-mining as a treatment option in comparison to engineering capping of legacy wastes, is not only environmentally safe and holistic but also meets the yardstick of fiscal prudence and propriety.”***

¹ Guidelines for Disposal of Legacy Waste (Old Municipal Solid Waste), Central Pollution Control Board, February 2019

33. ***Applying the above principle to the present case, we reject the plea of the State and direct that instead of capping of the dump site, it is imperative to do bio-mining and bioremediation in the interest of environment and to save valuable scarce public resource in the form of land. The land can be used for setting up integrated waste processing facilities and developing green belt or bio-diversity park. If the State/Corporation does not have funds, the State may consider monetizing a part of the land to raise revenue for the purpose, after following due process of law. In any case, capping cannot be permitted.***

34. ***We find that steps taken for legacy waste remediation are not adequate. The work has not even commenced at 138 out of 140 sites which is a matter of serious concern. The timeline needs to be consistent with the statutory rules as well as the orders of this Tribunal. The timeline 2025 proposed by the State of Telangana needs to be preponed accordingly.***

35. ***There remains gap of 4506 TPD for Telangana in terms of current generation and treatment of solid waste which is endangering environment, adversely affecting public health and posing serious threat to life. No firm commitment to remedy the gap consistent with the statutory Rules specially the timelines has been put forth, as expected in terms of directions of the Hon'ble Supreme Court and this Tribunal. Thus, suitable remedial measures need to be adopted in the matter.***

4. As mentioned in the order sought to be reviewed, the proceedings were transferred to this Tribunal by the Hon'ble Supreme Court vide order dated 02.09.2014 in Writ Petition No. 888/1996, *Almitra H. Patel v. Union of India & Ors.*, The said order also refers to earlier judgments in (2000) 2 SCC 679 and (2004) 13 SCC 538 containing observation that absence of waste disposal is resulting in slum creation and that the States, PCBs and local bodies have ignored the issue. The Rules are not being complied with inspite of mandate of law to secure clean environment as observed in *Municipal Council, Ratlam vs. Vardhichand*² and *B.L. Wadhera v. Union of India and Ors.*³.

² (1980) 4 SCC 162

³ (1996) 2 SCC 594

5. The Tribunal, vide order dated 22.12.2016⁴, directed all the States/UTs to follow SWM Rules, 2016 in terms of the timelines laid down therein. In this background, **the scope of proceedings before the Tribunal post 22.12.2016 is limited to execution. The Tribunal could not go behind the said order.** The Tribunal passed earlier orders dated 20.08.2018, 16.01.2019 which attained finality. It is thereafter, in the presence of Chief Secretary, Telangana, order dated 14.02.2020 was passed on due consideration. **Thus, the plea that the State of Telangana had taken irreversible steps prior to the order is not factually correct.**

6. We have noted that the applicant filed Civil Appeal No(s). _____ of 2020 (Diary No(s). 11490/2020) wherein following order was passed:

*“Mr. V. Giri, learned senior counsel appearing for the appellants submits that **there are certain issues which have not been considered by the National Green Tribunal (NGT).***

*Learned senior counsel seeks and is granted permission to withdraw this appeal **with liberty to approach the NGT by filing an application for review of the Order dated 14.2.2020 passed by the NGT in Original Application No. 606 of 2018.***

Liberty is given to the Appellants to approach this Court in case of dismissal of the review by challenging the order dated 14.02.2020 as well.

The appeal is, accordingly, dismissed as withdrawn with the aforesaid liberty.”

7. From the above, it is seen that the issue raised has been duly considered earlier and the review application merely seeks re-hearing. The averments in the review application that the action of capping had been undertaken **much after coming into force of the 2016 Rules** are not factually correct. As per the application, the design was prepared in March, 2018 much after the orders of this Tribunal requiring following

⁴ O.A. No. 199/2014 (2016) SCC Online NGT 2981

2016 Rules. Thus, the applicant acted in violation of law and to the detriment of the environment inspite of rules and binding orders to the contrary. As already mentioned, the design prepared and further steps taken result in irreversible damage to the environment by way of continuing generation of leachate, adversely affecting the groundwater.

8. Accordingly, even on reconsideration of the matter, in view of earlier binding orders of this Tribunal on the subject, the statutory mandate and the need for environmental protection, there is no merit in the review application. As already noted, it is not shown to be factually correct that when capping was done, it was legally permissible. The Tribunal has considered the issue earlier and rejected the very same contention not only of the applicants but also of several States/local bodies including Delhi Municipal Corporations, who find it convenient to avoid the mandate of law and to resort to capping, illegally and to the prejudice of the environment.

Accordingly, the review application is dismissed.

In view of main order, IA Nos. 31/2021 and 32/2021 also stand disposed of.

Adarsh Kumar Goel, CP

S.K. Singh, JM

Dr. Nagin Nanda, EM

February 18, 2021
Review Application No. 02/2021
IN Original Application No. 606/2018
(I.A. No. 31/2021 & I.A. No. 32/2021)
DV

IN THE SUPREME COURT OF INDIA
CIVIL APPELLATE JURISDICTION

CIVIL APPEAL NO(S). 809-810 /2022
(@ DIARY NO. 8943/2021)

THE GREATER HYDERABAD MUNICIPAL CORPORATION,
HYDERABAD & ANR.

APPELLANT(S)

VERSUS

CENTRAL POLLUTION CONTROL BOARD

RESPONDENT(S)

O R D E R

Delay condoned.

No ground is made out for our
interference with the judgment and order(s)
passed by the National Green Tribunal. The
appeal(s) is/are dismissed, accordingly.

Pending application(s), if any, shall stand
disposed of.

.....J
(L.NAGESWARA RAO)

.....J
(B.R. GAVAI)

Item No. 01

Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

(By Video Conferencing)

Original Application No. 606/2018

(In respect of State of Telangana)

In re: **Compliance of Municipal Solid Waste Management Rules,
2016 and other environmental issues**

**(Arising out of directions of the Hon'ble Supreme Court
in W.P. No. 888/1996 and W.P. No. 375/2012)**

Date of hearing: 29.09.2022

**CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE ARUN KUMAR TYAGI, JUDICIAL MEMBER
HON'BLE PROF. A. SENTHIL VEL, EXPERT MEMBER
HON'BLE DR. AFROZ AHMAD, EXPERT MEMBER**

Present: Shri Somesh Kumar, Chief Secretary, Govt of Telangana
Shri Rajath Kumar, Spl. Chief Secretary, Env., Science & Tech Dept.
Shri Arvind Kumar, Spl. Chief Secretary, Municipal Admn. & Urban Dev.
Department
Shri M. Dana Kishore, MD, Hyd. Metropolitan Water Supply & Sewerage
Board
Smt. Neetu Kumari Prasad, MS, TSPCB
Shri Lokesh Kumar, Commissioner, GHMC
Shri Satyanarayana, Commissioner & Director, Mun. Admn. Dept

ORDER

**The Issue – Monitoring of compliance of waste in terms of orders of
Hon'ble Supreme Court dated 02.09.2014 and 22.02.2017**

1. The issues of solid as well as liquid waste management are being monitored by this Tribunal as per orders of the Hon'ble Supreme Court order dated 02.09.2014 in *Writ Petition No. 888/1996, Almitra H. Patel vs. Union of India & Ors.*, with regard to solid waste management and order dated 22.02.2017 in W.P. No. 375/2012, reported in (2017) 5 SCC 326,

Paryavaran Suraksha vs. Union of India, with regard to liquid waste management. Other related issues include pollution of 351 river stretches, 124 non-attainment cities in terms of air quality, 100 polluted industrial clusters, illegal sand mining etc. which have also been dealt with earlier but we propose to limit the proceedings in the present matter to two issues of solid waste and sewage management.

ORDERS OF THE HON'BLE SUPREME COURT TRANSFERRING THE ISSUE OF SOLID WASTE MANAGEMENT AND LIQUID WASTE MANAGEMENT TO THIS TRIBUNAL:

Solid Waste Management

2. While transferring the issue of solid waste management vide Order dated 02.09.2014 in *Writ Petition No. 888/1996, Almitra H. Patel Vs. Union of India & Ors.*, the Hon'ble Supreme Court observed **“handling of solid municipal waste is a perennial challenge and would require constant efforts and monitoring with a view to making the municipal authorities concerned accountable, taking note of dereliction, if any, issuing suitable directions consistent with the said Rules and direction incidental to the purpose underlying the Rules such as upgradation of technology wherever possible. All these matters can, in our opinion, be best left to be handled by the National Green Tribunal established under the National Green Tribunal Act, 2010. The Tribunal, it is common ground, is not only equipped with the necessary expertise to examine and deal with the environment related issues but is also competent to issue in appropriate cases directions considered necessary for enforcing the statutory provisions.”**

3. Before transferring the said proceedings, matter was monitored by Hon'ble Supreme Court for about eighteen years and orders passed include (2000) 2 SCC 679 and (2004) 13 SCC 538, directing scientific disposal of

waste by setting up of compost plants/processing plants, preventing water percolation through heaps of garbage, creating focused **‘solid waste management cells’** in all States and complying with the Municipal Solid Waste Management Rules, 2000 (now replaced by SWM Rules, 2016). **It was observed that the local authorities constituted for providing services to the citizens are lethargic and insufficient in their functioning which is impermissible. Non-accountability has led to lack of effort on the part of the employees.** Domestic garbage and sewage along with poor drainage system in an unplanned manner contribute heavily to the problem of solid waste. The number of slums have multiplied significantly occupying large areas of public land. Promise of free land attracts more land grabbers. **Instead of “slum clearance” there is “slum creation” in cities which is further aggravating the problem of domestic waste being strewn in the open.** Accordingly, the Court directed that provisions pertaining to sanitation and public health be complied with, streets and public premises be cleaned daily, **statutory authorities levy and recover charges from any person violating laws and ensure scientific disposal of waste**, landfill sites be identified keeping in mind requirement of the city for next 20 years and environmental considerations, sites be identified for setting up of compost plants, steps be taken to prevent fresh encroachments and compliance report be submitted within eight weeks. Further observations in the judgment of the Hon’ble Supreme Court¹are:

“3. The petitioner has handed over a note in the Court showing the progress that has been made in some of the States and also setting out some of the suggestions, including the suggestion for creation of solid waste management cell, so as to put a focus on the issue and also to provide incentives to those who perform well as was tried in some of the States. The said note states as under:

¹ (2004) 13 SCC 538

- “1. As a result of the Hon’ble Supreme Court’s orders on 26-7-2004, in Maharashtra the number of authorisations granted for solid waste management (SWM) has increased from 32% to 98%, in Gujarat from 58% to 92% and in M.P. from NIL to 34%. No affidavits at all have been received from the 24 other States/UTs for which CPCB reported NIL or less than 3% authorisations in February 2004. All these States and their SPCBs can study and learn from Karnataka, Maharashtra and Gujarat’s successes.
2. **All States/UTs and their SPCBs/PCCs have totally ignored the improvement of existing open dumps, due by 31-12-2001**, let alone identifying and monitoring the existing sites. Simple steps can be taken immediately at almost no cost by every single ULB to prevent monsoon water percolation through the heaps, which produces highly polluting black run-off (leachate). Waste heaps can be made convex to eliminate standing water, upslope diversion drains can prevent water inflow, downslope diversion drains can capture leachate for recirculation onto the heaps, and disused heaps can be given soil cover for vegetative healing.
3. **Lack of funds is no excuse for inaction. Smaller towns in every State should go and learn from Suryapet in A.P. (population 103,000) and Namakkal in T.N. (population 53,000) which have both seen dustbin-free ‘zero garbage towns’ complying with the MSW Rules since 2003 with no financial input from the State or the Centre, just good management and a sense of commitment.**
4. **States seem to use the Rules as an excuse to milk funds from the Centre, by making that a precondition for action and inflating waste processing costs 2-3 fold.** The Supreme Court Committee recommended 1/3 contribution each from the city, State and Centre. Before seeking 70-80% Centre’s contribution, every State should first ensure that each city first spends its own share to immediately make its wastes non-polluting by simple sanitising/stabilising, which is always the first step in composting viz. inoculate the waste with cow dung solution or bio culture and placing it in windrows (long heaps) which are turned at least once or twice over a period of 45 to 60 days.
5. Unless each State creates a focussed **‘solid waste management cell’** and rewards its cities for good performance, both of which Maharashtra has done, compliance with the MSW Rules seems to be an illusion.
6. **The admitted position is that the MSW Rules have not been complied with even after four years.** None of the functionaries have bothered or discharged their duties to ensure compliance. **Even existing dumps have**

not been improved. Thus deeper thought and urgent and immediate action is necessary to ensure compliance in future.”

4. In this regard, reference may also be made to orders of Hon’ble Supreme Court in *Municipal Council, Ratlam vs. Vardhichand*² and *B.L. Wadhera v. Union of India and Ors.*³ laying down that **clean environment is fundamental right of citizens under Article 21** and it is for the local bodies as well as the State to ensure that public health is preserved by taking all possible steps. **For doing so, financial inability cannot be pleaded.** We note that even after 26 years of monitoring, 18 years by Hon’ble Supreme Court and eight years by this Tribunal, ground situation remains unsatisfactory.

Liquid Waste Management

5. Hon’ble Supreme Court in *Paryavaran Suraksha vs. Union of India*⁴ required this Tribunal to monitor directions for proper treatment of sewage to prevent untreated sewage and other effluents being discharged in water bodies by directing “We are of the view that mere directions are inconsequential, unless a rigid implementation mechanism is laid down. We, therefore, hereby provide that the directions pertaining to continuation of industrial activity only when there is in place a functional “primary effluent treatment plants”, and the setting up of functional “common effluent treatment plants” within the timelines, expressed above, shall be of the Member Secretaries of the Pollution Control Boards concerned. The Secretary of the Department of Environment, of the State Government concerned (and the Union Territory concerned), shall be answerable in case of default. **The Secretaries to the Government concerned shall be**

² (1980) 4 SCC 162

³ (1996) 2 SCC 594

⁴ (2017) 5 SCC 326

responsible for monitoring the progress and issuing necessary directions to the Pollution Control Board concerned, as may be required, for the implementation of the above directions. They shall be also responsible for collecting and maintaining records of data, in respect of the directions contained in this order. The said data shall be furnished to the Central Ground Water Authority, which shall evaluate the data and shall furnish the same to the Bench of the jurisdictional National Green Tribunal. To supervise complaints of non-implementation of the instant directions, the Benches concerned of the National Green Tribunal, will maintain running and numbered case files, by dividing the jurisdictional area into units. The abovementioned case files will be listed periodically. The Pollution Control Board concerned is also hereby directed to initiate such civil or criminal action, as may be permissible in law, against all or any of the defaulters.”

6. Extracts from the judgement of the Hon’ble Supreme Court in *Paryavaran Suraksha Samiti Vs. Union of India* are as follows:

“7. Having effectuated the directions recorded in the foregoing paragraphs, the next step would be, to set up common effluent treatment plants. **We are informed, that for the aforesaid purpose, the financial contribution of the Central Government is to the extent of 50%, that of the State Government concerned (including the Union Territory concerned) is 25%. The balance 25%, is to be arranged by way of loans from banks.** The above loans, are to be repaid, by the industrial areas, and/or industrial clusters. We are also informed that the setting up of a common effluent treatment plant, would ordinarily take approximately two years (in cases where the process has yet to be commenced). The reason for the above prolonged period, for setting up “common effluent treatment plants”, according to the learned counsel, is not only financial, but also, the requirement of land acquisition, for the same.

X.....X.....X.....

10. *Given the responsibility vested in municipalities under Article 243-W of the Constitution, as also, in Item 6 of Schedule XII, wherein the aforesaid obligation, pointedly extends to “public health, sanitation conservancy and solid waste management”, we are of the view that the onus to operate the existing common effluent treatment plants, rests on municipalities (and/or local bodies). Given the aforesaid responsibility, the municipalities (and/or local bodies) concerned, cannot be permitted to shy away from discharging this onerous duty. **In case there are further financial constraints, the remedy lies in Articles 243-X and 243-Y of the Constitution. It will be open to the municipalities (and/or local bodies) concerned, to evolve norms to recover funds, for the purpose of generating finances to install and run all the “common effluent treatment plants”, within the purview of the provisions referred to hereinabove. Needless to mention that such norms as may be evolved for generating financial resources, may include all or any of the commercial, industrial and domestic beneficiaries, of the facility. The process of evolving the above norms, shall be supervised by the State Government (Union Territory) concerned, through the Secretaries, Urban Development and Local Bodies, respectively (depending on the location of the respective common effluent treatment plant). The norms for generating funds for setting up and/or operating the “common effluent treatment plant” shall be finalised, on or before 31-3-2017, so as to be implemented with effect from the next financial year. In case, such norms are not in place, before the commencement of the next financial year, the State Governments (or the Union Territories) concerned, shall cater to the financial requirements, of running the “common effluent treatment plants”, which are presently dysfunctional, from their own financial resources.***
11. *Just in the manner suggested hereinabove, for the purpose of setting up of “common effluent treatment plants”, the State Governments concerned (including, the Union Territories concerned) will prioritise such cities, towns and villages, which discharge **industrial pollutants and sewer, directly into rivers and water bodies.***
12. *We are of the view that in the manner suggested above, **the malady of sewer treatment, should also be dealt with simultaneously. We, therefore, hereby direct that “sewage treatment plants” shall also be set up and made functional, within the timelines and the format, expressed hereinabove.***

7. Expression “Common Effluent Treatment Plants” in para 7 may infact refer to the STPs, as the context shows.

8. On this subject, inspite of deadline of 31.3.2018 fixed by Hon’ble Supreme Court for finalizing funding arrangements and February 2020 for all arrangements for preventing discharge of pollutants and rigorous monitoring by this Tribunal for the last five years, ground situation remains unsatisfactory.

Procedural History of present proceedings before this Tribunal

9. In the light of above, the Tribunal has considered the matter in the last eight years as far as solid waste management is concerned and more than five years as far as liquid waste management is concerned. Main orders on the subject include orders dated 22.12.2016, 31.08.2018, 16.01.2019, 28.8.2019, 12.09.2019, 6.12.2019, 07.01.2020, 28.02.2020, 02.07.2020, 14.12.2020, 22.2.2021, 30.11.2021, 14.12.2020 and 31.05.2022. First two orders - dated 22.12.2016 and 31.08.2018 deal only with solid waste management. Orders dated 28.8.2019, 6.12.2019 and 22.2.2021 deal with only liquid waste management while the remaining orders deal with solid waste as well as liquid waste management. Issue of liquid waste has also been separately dealt with in OA No. 593/2017 which was finally disposed of on 22.02.2021 with direction that further monitoring be undertaken by Central Monitoring Committee constituted by the said order. It was held that monitoring by the Tribunal cannot be for indefinite time and State authorities are primarily responsible for such monitoring after adequate monitoring by the Tribunal. By the same order, the Tribunal also dealt with the issue of 351 identified polluted river stretches in OA 673/2018. This is apart from individual cases dealing with

solid and liquid waste management. A brief reference of these orders will be made hereafter.

Orders dated 22.12.2016 and 31.08.2018

10. Vide order dated 22.12.2016, (2016) SCC Online NGT 2981, the issue of Solid Waste Management was disposed of requiring strict compliance of Solid Waste Management Rules, 2016 by all the States/UTs making it clear that if violations continue, the State will be liable to pay compensation. Later, matter was taken up to ascertain compliance status and finding that all the States/UTs were still non-compliant in the matter, the matter was again taken up and fresh directions issued for monitoring by the Tribunal constituted Monitoring Committees vide order dated 31.08.2018. Later, continuance of the committees was left to discretion of the States, depending on their own monitoring mechanism.

Order dated 16.01.2019 requiring personal presence of Chief Secretaries of all States and UTs to explore remedial action after interaction with them and further orders

11. In view of continuing non-compliances, vide order dated 16.01.2019, the Tribunal directed personal presence of Chief Secretaries of all States and UTs for interaction to ensure compliance. The Tribunal held that large scale non-compliance of environmental norms was resulting in deaths and diseases and irreversible damage to the environment, without accountability for such failures. Though violation of the Rules as well as orders of this Tribunal is criminal offence, still there was rampant violation by State authorities practically with no accountability which unhappy situation was required to be remedied by involvement of highest functionaries of the State in the interest of public health and to uphold rule of law.

12. In terms of order dated 16.1.2019, the Chief Secretaries of all the States/UTs appeared on different dates till 18.07.2019 and the Tribunal, after reviewing the status of noncompliance on most of the issues, directed further effective steps to be taken for compliance of the Rules and the environmental norms. The Chief Secretary of Telangana appeared on 29.04.2019 and following directions were issued:

“48. In view of above, after discussion with the Chief Secretary, following further directions are issued:

- i. Atleast three major cities and three major towns in the State and atleast three Panchayats in every District may be notified on the website within two weeks from today as model cities/towns/villages which will be made fully compliant within the next six months. Remaining cities, towns and villages Panchayats of the State may be made fully compliant in respect of environmental norms within one year.*
- ii. A quarterly report be furnished by the Chief Secretary, every three months. First such report shall be furnished by July 30, 2019.*
- iii. The Chief Secretary may personally monitor the progress, atleast once in a month, with all the District Magistrates.*
- iv. The District Magistrates may monitor the status of compliance of environmental norms, atleast once in two weeks.*
- v. The District Magistrates or other Officers may be imparted requisite training.*
- vi. Estimate of value of environmental degradation and cost of restoration be prepared and compensation be planned and recovered from polluters for environmental restoration and restitution on that basis.*
- vii. Performance audit of functioning of all regulatory bodies may be got conducted and remedial measures be taken, within six months.*
- viii. Introduction of a policy of giving ranking, based on performance on the subject of environment and giving of rewards or other incentives on that basis to individual areas, localities, institutions or individuals may be considered. This may also include encouraging students or other citizens significantly contributing to the cause of environment. The best practices may be evolved, if necessary, in the light of experiences on the subject. This*

may help in educating and involving public at large which may help in enhancing of environmental laws.”

13. The Chief Secretary, Telangana appeared again on 14.02.2020 and the Tribunal inter-alia issued following directions:

“41. In view of above, consistent with the directions referred to in Para 29 issued on 10.01.2020 in the case of UP, Punjab and Chandigarh which have also been repeated for other States in matters already dealt with, we direct:

- a. *In view of the fact that most of the statutory timelines have expired and directions of the Hon’ble Supreme Court and this Tribunal to comply with Solid Waste Management Rules, 2016 remain unexecuted, compensation scale is hereby laid down for continued failure after 31.03.2020. The compliance of the Rules requires taking of several steps mentioned in Rule 22 from Serial No. 1 to 10 (mentioned in para 12 above). Any such continued failure will result in liability of every Local Body to pay compensation at the rate of Rs. 10 lakh per month per Local Body for population of above 10 lakhs, Rs. 5 lakh per month per Local Body for population between 5 lakhs and 10 lakhs and Rs. 1 lakh per month per other Local Body from 01.04.2020 till compliance. If the Local Bodies are unable to bear financial burden, the liability will be of the State Governments with liberty to take remedial action against the erring Local Bodies. Apart from compensation, adverse entries must be made in the ACRs of the CEO of the said Local Bodies and other senior functionaries in Department of Urban Development etc. who are responsible for compliance of order of this Tribunal.*
- b. *Legacy waste remediation was to ‘commence’ from 01.11.2019 in terms of order of this Tribunal dated 17.07.2019 in O.A. No. 519/2019 para 28 even though statutory timeline for ‘completing’ the said step is till 07.04.2021 (as per serial no. 11 in Rule 22), which direction remains unexecuted at most of the places. Continued failure of every Local Body on the subject of commencing the work of legacy waste sites remediation from 01.04.2020 till compliance will result in liability to pay compensation at the rate of Rs. 10 lakh per month per Local Body for population of above 10 lakhs, Rs. 5 lakh per month per Local Body for population between 5 lakhs and 10 lakhs and Rs. 1 lakh per month per other Local Body. If the Local Bodies are unable to bear financial burden, the liability will be of the State Governments with liberty to take remedial action against the erring Local Bodies. Apart from compensation, adverse entries must be made in the ACRs of the CEO of the said Local Bodies and other senior functionaries in Department of Urban Development etc.*

who are responsible for compliance of order of this Tribunal.

- c. Further, with regard to thematic areas listed above in para 20, steps be ensured by the Chief Secretaries in terms of directions of this Tribunal especially w.r.t. plastic waste, bio-medical waste, construction and demolition waste which are linked with solid waste treatment and disposal. Action may also be ensured by the Chief Secretaries of the States/UTs with respect to remaining thematic areas viz. hazardous waste, e-waste, polluted industrial clusters, reuse of treated water, performance of CETPs/ETPs, groundwater extraction, groundwater recharge, restoration of water bodies, noise pollution and illegal sand mining.*
- d. The compensation regime already laid down for failure of the Local Bodies and/or Department of Irrigation and Public Health/In-charge Department to take action for treatment of sewage in terms of observations in para 36 above will result in liability to pay compensation as already noted above which are reproduced for ready reference:*
 - i. Interim measures for phytoremediation/ bioremediation etc. in respect of 100% sewage to reduce the pollution load on recipient water bodies – 31.03.2020. Compensation is payable for failure to do so at the rate of Rs. 5 lakh per month per drain by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2020.*
 - ii. Commencement of setting up of STPs – 31.03.2020. Compensation is payable for failure to do so at the rate of Rs. 5 lakh per month per STP by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2020.*
 - iii. Commissioning of STPs – 31.03.2021. Compensation is payable for failure to do so at the rate of Rs. 10 lakh per month per STP by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2021.*
- e. Compensation in above terms may be deposited with the CPCB for being spent on restoration of environment which may be ensured by the Chief Secretaries' of the States/UTs.*
- f. An 'Environment Monitoring Cell' may be set up in the office of Chief Secretaries of all the States/UTs within one month from today, if not already done for coordination and compliance of above directions which will be the responsibility of the Chief Secretaries of the States/UTs.*

- g. Compliance reports in respect of significant environmental issues may be furnished in terms of order dated 07.01.2020 quarterly with a copy to CPCB."*

14. In short, the Tribunal expected three model cities, towns and villages to be made compliant in six months and the remaining State with one year. It was this target for the State by setting up of environmental cells directly under the Chief Secretaries, regular periodical monitoring by the Chief Secretaries at the State level and by the District Magistrates at the District level. Further direction also was to take action for non-compliance by recovery of compensation and recording adverse ACRs against erring officers. The Tribunal also directed filing of quarterly reports by the Chief Secretaries. Based on such reports, CPCB was to file consolidated status reports. The Chief Secretaries were to appear again after six months with updated status of compliance. It is difficult to hold that the State has taken directions of the Tribunal seriously or even endeavoured to go by this mandate. Even after three years, neither there is adequate compliance nor the same has been projected in immediate future. No accountability fixed, no performance audit shown to have been conducted and no entries in ACRs are shown to have been made. There is nothing to show that compensation has been recovered in terms of directions of the Tribunal. The State assumes that none is responsible for such gross violations of law and directions of Hon'ble Supreme Court and this Tribunal. It is difficult to say how rule of law will be achieved. We thus record our disappointment with the attitude of the State and hope the State makes amends in compliance now.

15. The Tribunal has been receiving progress reports from States as well as monitoring Committees wherever functioning which have been considered by further orders.

Further Review after completing round of interaction with all Chief Secretaries by order dated 12.9.2019

16. The matter was then reviewed on 12.09.2019 in the light of report of the CPCB dated 09.09.2019 **showing wide gaps in compliance of solid waste, plastic waste, bio-medical waste management, rejuvenation of identified polluted river stretches, polluted industrial clusters and non-attainment cities.** A fresh schedule for appearance of the Chief Secretaries was issued. Vide order dated 07.01.2020, the Tribunal directed CPCB to ascertain Compliance of Solid Waste Management Rules, 2016 in terms of MSW generated, segregated and treated, gaps in the waste processing, enforcement of statutory timelines and orders of this Tribunal, number of sites remediated, and quantity of legacy waste therein and timelines for completing remediation. It was further directed that on the subject of sewage treatment, CPCB has to ascertain quantity of sewage generated and treated in the State, gap in the sewage treatment and timelines to bridge the gap, including strategy for use of treated water for secondary purpose. CPCB was accordingly directed to redesign its formats for securing relevant quantifiable information.

Order dated 28.02.2020

17. Accordingly, the Chief Secretaries of 18 States/UTs appeared and filed updated status reports. Since there still existed huge gaps in compliance, further directions were issued by way of different orders. Last such order is of 28.2.2020. Other orders are on same pattern. The direction part of the said order is reproduced below:

“41. In view of above, consistent with the directions referred to in Para 29 issued on 10.01.2020 in the case of UP, Punjab and Chandigarh which have also been repeated for other States in matters already dealt with, we direct:

- a. In view of the fact that most of the statutory timelines have expired and directions of the Hon’ble Supreme Court and this Tribunal to comply with Solid Waste Management Rules, 2016 remain unexecuted, **interim compensation scale is hereby laid down for continued failure after 31.03.2020. The compliance of the Rules requires taking of several steps mentioned in Rule 22 from Serial No. 1 to 10 (mentioned in para 12 above). Any such continued failure will result in liability of every Local Body to pay compensation at the rate of Rs. 10 lakh per month per Local Body for population of above 10 lakhs, Rs. 5 lakh per month per Local Body for population between 5 lakhs and 10 lakhs and Rs. 1 lakh per month per other Local Body from 01.04.2020 till compliance. If the Local Bodies are unable to bear financial burden, the liability will be of the State Governments with liberty to take remedial action against the erring Local Bodies. Apart from compensation, adverse entries must be made in the ACRs of the CEO of the said Local Bodies and other senior functionaries in Department of Urban Development etc. who are responsible for compliance of order of this Tribunal. Final compensation may be assessed and recovered by the State PCBs/PCCs in the light of Para 33 above within six months from today. CPCB may prepare a template and issue an appropriate direction to the State PCBs/PCCs for undertaking such an assessment in the light thereof within one month.**
- b. **Legacy waste remediation was to ‘commence’ from 01.11.2019 in terms of order of this Tribunal dated 17.07.2019 in O.A. No. 519/2019 para 28⁵ even though statutory timeline for ‘completing’ the said step is till 07.04.2021 (as per serial no. 11 in Rule 22), which direction remains unexecuted at most of the places and delay in clearing legacy waste is causing huge damage to environment in monetary terms as noted in para 33 above, pending assessment and recovery of such damage by the**

⁵ The Chief Secretaries may ensure allocation of funds for processing of legacy waste and its disposal and in their respective next reports, give the progress relating to management of all the legacy waste dumpsites. Remediation work on all other dumpsites may commence from 01.11.2019 and completed preferably within six months and in no case beyond one year. Substantial progress be made within six months. We are conscious that the SWM Rules provide for a maximum period of upto five years for the purpose, however there is no reason why the same should not happen earlier, in view of serious implications on the environment and public health.

concerned State PCB within four months from today, continued failure of every Local Body on the subject of commencing the work of legacy waste sites remediation from 01.04.2020 till compliance will result in liability to pay compensation at the rate of Rs. 10 lakh per month per Local Body for population of above 10 lakhs, Rs. 5 lakh per month per Local Body for population between 5 lakhs and 10 lakhs and Rs. 1 lakh per month per other Local Body. If the Local Bodies are unable to bear financial burden, the liability will be of the State Governments with liberty to take remedial action against the erring Local Bodies. Apart from compensation, adverse entries must be made in the ACRs of the CEO of the said Local Bodies and other senior functionaries in Department of Urban Development etc. who are responsible for compliance of order of this Tribunal. Final compensation may be assessed and recovered by the State PCBs/PCCs in the light of Para 33 above within six months from today.

- c. Further, with regard to thematic areas listed above in para 20, steps be ensured by the Chief Secretaries in terms of directions of this Tribunal especially w.r.t. plastic waste, bio-medical waste, construction and demolition waste which are linked with solid waste treatment and disposal. Action may also be ensured by the Chief Secretaries of the States/UTs with respect to remaining thematic areas viz. hazardous waste, e-waste, polluted industrial clusters, reuse of treated water, performance of CETPs/ETPs, groundwater extraction, groundwater recharge, restoration of water bodies, noise pollution and illegal sand mining.
- d. The compensation regime already laid down for failure of the Local Bodies and/or Department of Irrigation and Public Health/In-charge Department to take action for treatment of sewage in terms of observations in Para 36 above will result in liability to pay compensation as already noted above which are reproduced for ready reference:
 - i. **Interim measures for phytoremediation/ bioremediation etc. in respect of 100% sewage to reduce the pollution load on recipient water bodies – 31.03.2020. Compensation is payable for failure to do so at the rate of Rs. 5 lakh per month per drain by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2020.**
 - ii. **Commencement of setting up of STPs – 31.03.2020. Compensation is payable for**

failure to do so at the rate of Rs. 5 lakh per month per STP by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2020.

iii. Commissioning of STPs – 31.03.2021. Compensation is payable for failure to do so at the rate of Rs. 10 lakh per month per STP by concerned Local Bodies/States (in terms of orders dated 28.08.2019 in O.A. No. 593/2017 and 06.12.2019 in O.A. No. 673/2018) w.e.f. 01.04.2021.

- e. Compensation in above terms may be deposited with the CPCB for being spent on restoration of environment which may be ensured by the Chief Secretaries' of the States/UTs.
- f. An 'Environment Monitoring Cell' may be set up in the office of Chief Secretaries of all the States/UTs within one month from today, if not already done for coordination and compliance of above directions which will be the responsibility of the Chief Secretaries of the States/UTs.
- g. Compliance reports in respect of significant environmental issues may be furnished in terms of order dated 07.01.2020 quarterly with a copy to CPCB."

18. Timelines under the Rules referred to in sub para (a) above are :

"22. Time frame for implementation:- Necessary infrastructure for implementation of these rules shall be created by the local bodies and other concerned authorities, as the case may be, on their own, by directly or engaging agencies within the time frame specified below:

Sl. No.	Activity	Time limit from the date of notification of rules
(1)	(2)	(3)
1.	Identification of suitable sites for setting up solid waste processing facilities.	1 year
2.	Identification of suitable sites for setting up common regional sanitary landfill facilities for suitable clusters of local authorities under 0.5 million population and for setting up common regional sanitary landfill facilities or stand alone sanitary landfill facilities by all local authorities having a population of 0.5 million or more.	1 year
3.	Procurement of suitable sites for setting up solid waste processing facility and sanitary landfill facilities.	2 years

4.	<i>Enforcing waste generators to practice segregation of bio degradable, recyclable, combustible, sanitary waste domestic hazardous and inert solid wastes at source.</i>	<i>2 years</i>
5.	<i>Ensure door to door collection of segregated waste and its transportation in covered vehicles to processing or disposal facilities.</i>	<i>2 years</i>
6.	<i>ensure separate storage, collection and transportation of construction and demolition wastes.</i>	<i>2 years</i>
7.	<i>setting up solid waste processing facilities by all Local Bodies having 100000 or more population.</i>	<i>2 years</i>
8.	<i>Setting up solid waste processing facilities by Local Bodies and census towns below 100000 population.</i>	<i>3 years</i>
9.	<i>setting up common or stand alone sanitary landfills by or for all Local Bodies having 0.5 million or more population for the disposal of only such residual wastes from the processing facilities as well as untreatable inert wastes as permitted under the Rules.</i>	<i>3 years</i>
10.	<i>setting up common or regional sanitary landfills by 3 years all Local Bodies and census towns under 0.5 million population for the disposal of permitted waste under the rules.</i>	<i>3 years</i>
11.	<i>bio-remediation or capping of old and abandoned dump sites.</i>	<i>5 years</i>

”

19. **Our comments with regard to compliance of directions dated 28.2.2020 remain the same as in para 13 above.**

Order dated 02.07.2020

20. The matter was then considered on 02.07.2020. Having regard to the pandemic, appearance of remaining Chief Secretaries was deferred.

Order dated 14.12.2020

21. The matter was further considered on 14.12.2020 for review of progress. Scheduled appearance of remaining Chief Secretaries was dispensed with but it was directed that monitoring at the level of Chief Secretaries may continue and quarterly status reports be filed with CPCB so that CPCB may file a consolidated report every six months before the Tribunal. It was further directed that compensation in terms of earlier

orders be recovered and credited to a separate account with the Environment Department of concerned State to be used for restoration of environment. It was also observed that in these proceedings Solid Waste Management also will be monitored, other issues being considered in separate proceedings.

22. As already noted above, there is nothing to show compliance by the State of Telangana on the issue of deposit of compensation and its utilization as directed.

Further review on 30.11.2021 – huge gaps still found and hence, another round of interaction with Chief Secretaries proposed

23. The matter was thereafter taken up on 30.11.2021 to consider the report of CPCB dated 25.10.2020 giving compliance status in 32 States/UTs as in March, 2021 as follows:-

“Solid Waste Management

4.0 SUMMARY & CONCLUSIONS

- a. *Total No. of ULBs in 29 States/UTs is 4186.*
- b. ***As per information provided by 29 States/UTs - total waste generated is 150858.951 TPD of which 94435.318 TPD is processed, which is 62.6% of the total waste generated in these States/UT. 11772.4538 TPD (7.8%) of the waste is landfilled and the gap in Solid waste management in 29 States is 45071.771 TPD which is 29.8% of the waste generated in these States/UTs.***
- c. *Information on MRF has been provided for 28 States/UTs covering 77% of ULBs in these States/UTs.*
- d. *Information on Recycling facilities have been provided for 22 States/UTs covering 39% of ULBs in these States/UTs*
- e. *Information on Composting facilities has been provided for all 29 States/UTs covering 70% of ULBs in these States/UTs*
- f. *Information on WtE has been provided for 25 out of 29 States/UTs covering 1.9% of ULBs in these States/UTs.*
- g. *Information on RDF has been provided for 24 out of 29 States/UTs covering 12.4% of ULBs in these States/UTs.*

- h. *Information on Bio-methanation has been provided for 27 out of 29 States/UTs covering 7.1% of ULBs in these States/UTs.*
- i. ***Information on Landfills has been provided in 24 out of 29 States/UTs covering 18.9% of ULBs in the States.***
- j. *498 of 2111 (23%) dumpsites in 25 States/UTs have been cleared and Remediation has been initiated in 23% (496) of the dumpsites.*
- k. *Model Town/Cities have been identified in 25 States/UTs.*
- l. *16 States /UTs have established environmental cells.*
- m. ***15 States /UTs have standardised rates for procurement of services/equipment required for solid waste management.***
- n. *In view of above, States/UTs need to develop of ULB wise action plan for collection, segregation, transportation and processing of waste and lay down an appropriate governance framework at state and district levels.”*

24. The Tribunal in its order dated 30.11.2021 observed:-

“1to17....xxxx.....xxx.....xxx

18. We are of the view that hence forthwith proceedings in this matter need to cover Solid Waste Management and Sewage Management, these issues being crucial and required to be monitored by this Tribunal by the Hon’ble Supreme Court. Absence of management of waste results in adding to air and water pollution in a big way. All the legacy waste dump sites in the country need to be remediated to reduce methane gas, foul smell and leachate and also to release valuable land occupied by such sites which can be used for waste management/plantation or raising funds. Waste collected must be scientifically processed and disposed at the earliest in the interest of hygiene and public health. It needs to be ensured that instead of remediating the legacy waste sites, the garbage is not shifted to new sites which is not a solution to the problem. It only results in shifting the problem from one place to the other without any advancement of environment protection. What is necessary is that the garbage must be finally disposed of and land reclaimed. The authorities must move towards zero garbage at the end of the day by ensuring that instead of garbage being collected and dumped, it is taken to destination where it is finally processed scientifically and appropriately, except for reused/recycling of such residues as is possible. This is also the mandate of Swachh Bharat Mission, initiated by the Central Government. Similarly, sewage has to be scientifically treated to give effect to the mandate of Water (Prevention and Control of Pollution) Act, 1974 in the interest of availability of clean water in rivers and other waterbodies. Central Governments programmes also provide for initiatives

on these subjects. On both aspects, compensation regime has been laid down which is necessary to enforce the rule of law and for protection of environment and public health. The compensation laid down has to be duly collected and utilized for restoration of environment, by being kept in a separate account. Accountability for the failures needs to be fixed by way of ACRs and departmental action as such failures result in crimes under the law of land and damage to public health. Such failure is also breach of Constitutional obligation to uphold the Right to Life. The country is committed to Sustainable Development Goals of providing clean air and safe drinking water.

19. In view of above, continued failure of Rule of Law must be remedied in terms of mandate of orders of the Hon'ble Supreme Court in Writ Petition No. 888/1996, Almitra H. Patel Vs. Union of India & Ors. and Paryavaran Suraksha vs. Union of India,⁶ followed by orders of this Tribunal. It is necessary that Chief Secretaries continue the monitoring and interact with this Tribunal periodically by video conferencing. Accordingly, we lay down following further schedule for personal appearance of the Chief Secretaries, by Video Conferencing, with the status of compliance in respect of each of the States/UTs on the subject of Solid Waste Management and Sewage Management. The data to be furnished should cover all categories of areas in the State – big cities, towns and villages.

20. The hearing on each of above dates will commence at 10:30 a.m. sharp. The Chief Secretaries may not delegate the responsibility. As far as possible, they may adjust other work for which long advance notice is being given. In case adjustment is found difficult for any unforeseen reason, request for change of date may be mailed by e-mail at judicial-ngt@gov.in.

21. All the States/CPCB may undertake process of verification of data after having interaction on video conferencing with the concerned States/UTs within one month. The Secretaries, Environment, Urban Development Department and Irrigation Department may also coordinate with the Member Secretaries of State Legal Services Authorities in all State/UTs in the light of background mentioned in paras 3 and 4 above for the awareness programmes on the subject."

Separate orders dated 28.8.2019, 12.9.2019, 6.12.2019 and 22.02.2021 on the subject of Liquid Waste Management

25. Issue of liquid waste management was separately dealt with in OA 593/2017 on directions of Hon'ble Supreme Court and in suo motu proceedings for restoration of 351 identified polluted river stretches in OA

⁶ (2017) 5 SCC 326

673/2018. Vide order dated 28.08.2019, the Tribunal directed that 100% sewage treatment must be ensured by all local bodies. Vide further order dated 06.12.2019 in O.A. No. 673/2018⁷, the Tribunal directed that for failure to commence in-situ remediation, compensation will be payable at the rate of Rs. 5 lakh per month per drain after 31.03.2020 and for failure to commence setting up of STPs after 31.03.2020 compensation is to be paid at the rate of Rs. 5 lakh per month per STP. For failure to complete the project, compensation has to be paid at the rate of Rs. 10 lakh per STP per month after 31.03.2021. Relevant part of the order is quoted below:

***“47. (i) 100% treatment of sewage may be ensured as directed by this Tribunal vide order dated 28.08.2019 in O.A. No. 593/2017 by 31.03.2020 atleast to the extent of in-situ remediation and before the said date, commencement of setting up of STPs and the work of connecting all the drains and other sources of generation of sewage to the STPs must be ensured. If this is not done, the local bodies and the concerned departments of the States/UTs will be liable to pay compensation as already directed vide order dated 22.08.2019 in the case of river Ganga i.e. Rs. 5 lakhs per month per drain, for default in in-situ remediation and Rs. 5 lakhs per STP for default in commencement of setting up of the STP.*”**

ii. Timeline for completing all steps of action plans including completion of setting up STPs and their commissioning till 31.03.2021 in terms of order dated 08.04.2019 in the present case will remain as already directed. In default, compensation will be liable to be paid at the scale laid down in the order of this Tribunal dated 22.08.2019 in the case of river Ganga i.e. Rs. 10 lakhs per month per STP.”

26. Both the matters were disposed of vide order dated 22.02.2021 with a direction that further monitoring be continued at the level of the Chief Secretaries in States and Central Monitoring Committee headed by Secretary, Ministry of Jal Shakti at the national level.

⁷ News item published in "The Hindu" authored by Shri Jacob Koshy Titled "More river stretches are now critically polluted: CPCB"

Today’s hearing in the presence of Chief Secretary, Telangana to ascertain compliance status and way forward

Compliance status in Telangana presented

27. The presentation filed by the Chief Secretary, Telangana on 28.09.2022 shows following data:

SUMMARY OF STATUS

A: <u>Solid Waste Management*</u>					
Quantity of waste generation in the State (in TPD)	Waste Processed (in TPD)	Gap in generation and Processing (in TPD)	Quantity of waste being disposed in landfills (in TPD)	Quantity of Legacy waste in the State (Tones)	Status of Bio-mining
12,125 (142 ULBs)	9679	2446	2446	5.9 Million Tonnes (151 dump sites in 123 ULBs)	• One site (GHMC) capped with 12 Million Tonnes • 5.9 Million Tonnes to be remediated

* Data taken from page no. 4 and 25 of the presentation filed by the Chief Secretary.

B): <u>Sewage Management**</u>					
Quantity of sewage generation in the State (in MLD)	Utilization of Treatment capacity (in MLD)	Current Gap in treatment (in MLD)	Utilization of treated sewage in		
			Agriculture/ Horticulture purpose	Industrial purpose	Any other purpose
2750	925.58	1824.42	925.58 MLD		

** Data taken from page no. 38 and 47 of the presentation filed by the Chief Secretary.

Our Observations findings and Directions

28. It is seen from the data presented by the Chief Secretary that after 14.02.2020 when the Chief Secretary, Telangana last appeared before the Tribunal in the present matter, there is no substantial progress as there still exist huge gaps in management of solid and liquid waste.

29. **On the issue of solid waste management**, un-remediated legacy waste is 5.9 Million Tonnes in 141 ULBs. Further, more unprocessed waste is being added on daily basis to the extent of 2446 Tonne Per Day (TPD). Dump sites in operation as well as the legacy waste dump sites remain source of air, water and land pollution resulting in damage to environment and public health. In recent order of the Tribunal dated 18.08.2022 in RA No. 21/2022 in OA No. 286/2022, two scientific studies on the subject of environmental damage have been referred to. These are reproduced below:

“7. ...Legacy waste dumpsites are serious threat to public health and also source of generation of greenhouse gases. The Tribunal considered the issue of quantification of loss to environment by legacy waste dump sites inter alia in OA 514/2018 and OA 519/2019. Orders passed show that as per expert studies, loss for such failure, due to release of pollutants in air atmosphere, release of leachate into ground / surface water and soil, due to pollution from the landfill site, damage cost associated with climate change due to carbon di-oxide and methane, damage caused due to aesthetics loss, price depreciation due to disamenity cost etc., is huge running in hundreds of crores. Some of the orders showing this are quoted below:

Order dated 23.03.2020 in O.A. No. 519/2019

“xxx.....xxx.....xxx

18. We may observe that non-compliance of rules relating to waste disposal results in damage to the environment and public health. Any failure needs to be visited with assessment and recovery of compensation for such damage from the persons responsible for such failure. **A study was recently got conducted by CPCB, under orders of this Tribunal requiring such a study by a joint Committee comprising CPCB, NEERI and IIT, Delhi about the monetary cost of damage caused to the environment on account of existence of legacy waste dump site at Gurgaon (Bandhewadi) vide order dated 05.03.2019 in O.A. No. 514/2018. The report of the CPCB filed on 13.02.2020 is that damage on account of the said legacy waste dump site was Rs. 148.46 crore, on account of damage to the air quality, soil and water quality, climate change and disamenity (aesthetic).** The damage has been assessed in terms of impact on health due to release of pollutants in air atmosphere, release of leachate into ground / surface water and soil, due to pollution from the landfill site, damage cost associated with climate change due to carbon di-oxide and

methane, damage caused due to aesthetics loss, price depreciation due to disamenity cost etc.

19. Thus, monetary cost of every legacy dump site is expected to be huge depending upon the location, quantity and quality of waste and area covered, its proximity to water body/ stream and human habitation etc. Needless to say that there is huge cost for non-compliance of provisions relating to waste management – Solid as well as Liquid. Loss to the environment and public health is taking place not only on account of delay in clearing legacy waste but also for not complying with other provisions of the Rules resulting in huge gap in generation and processing of waste. It may be necessary to determine such cost for delay in clearing legacy waste at every dump site as well as for delay in complying with other rules and failure to treat sewage and recover the same from the persons responsible for action in the matter. **Let the Committee comprising CPCB, NEERI & IIT Delhi carry out similar study as mentioned in Para 18 above to assess the amount of damage to environment on account of dump sites in Delhi within two months.”**

Order dated 29.01.2021 in O.A. No. 519/2019

“6. Accordingly, status report dated 28.01.2021 has been filed by the CPCB as follows:-

“2.0 Action Taken :-

In compliance of Para 19 of aforesaid Hon'ble NGT's Order, Joint committee comprising of following members has been formed:

- Dr. S. K. Goyal, Chief Scientist and Head, NEERI Delhi Zonal Center
- Dr. G .V .Ramanna, Professor, Department. of Civil Engg., IIT-Delhi
- Ms D. Sinha, DH- UPC-II, CPCB
- Mr. P. Agarwal, Scientist-E, CPCB

Report on **"Assessment of amount of damage to environment on account of dumpsites in Delhi"** as prepared by Joint committee is placed at **Annexure-A**. Amount of Damage to Environment due to three dumpsites of Delhi to be levied on Municipal Corporations of Delhi is given in the following table:

S. No.	Name of Municipal Corporation	Name of Dumpsite	Damage Cost assessed, (Rupees)
1.	NDMC (North Delhi Municipal Corp.)	Bhalswa	155.9 Crore

2.	EDMC (East Delhi Municipal Corp.)	Ghazipur	142.5 Crore
3.	SDMC (South Delhi Municipal Corp.)	Okhla	151.1 Crore

xxx.....xxx.....xxx

7. Report of inspection conducted by the joint Committee comprising of the CPCB, NEERI and IIT Delhi is filed with following summary and conclusion:

“5.0 SUMMARY & CONCLUSION :

- i. Hon'ble NGT in OA No. 519/2019 constituted a Committee comprising of CPCB, NEERI & IIT Delhi to assessment of damage to environment due of dump sites in Delhi within two months.
- ii. Baseline information was collected by Committee through Questionnaire sent to three concerned Municipal Corporations (MCs). As per the information provided by the MCs, bio mining is being carried out at all three sites. **However, about 6% of waste has been bio-remediated at the three sites.** Further, fresh waste is being dumped at all three dumpsites.
- iii. Potential sources of air pollution at the sites include handling of fresh waste, Bio mining of legacy waste, Methane and other Green House gases from the Dumpsite , transportation of fresh waste & screened fractions, Odour & Fire accidents. Potential sources of water pollution at the sites includes Leachate which is being generated at all the three dumpsites
- iv. Air Pollution control measures taken at site includes mainly includes sprinkling of water. It has been informed by the authorities that smog guns are being procured for control of air pollution. **No concrete measures for leachate collection and treatment have being taken at the three dumpsites. Leachate is partially being recirculated for stabilization of waste and the remaining is being discharged into nearby surface water drains. Actual details regarding quantity of leachate used/ discharged not provided by the concerned authorities**

- v. Concentration of TDS, TSS, COD & BOD in leachate exceeds the stipulated norms at all the three dumpsites. Concentration of Heavy metals is within the stipulated norms with the exception of lead which has marginally exceeded the permissible limits at Ghazipur. Assessment of Ambient Air, Surface & Ground Water quality is based on monitoring data of CPCB for the past three years. Zone of impact has been considered to be 5 km and information related to monitored stations located within and beyond this radius has been compiled and analysed. In addition, information provided by Delhi Pollution Control Committee regarding ground water monitoring has been taken into consideration.
- vii. **As per air quality monitoring data, PM₁₀ & PM_{2.5} concentrations exceeded the prescribed values at all monitored stations upto 5 km distance & beyond from the Dumpsite sites.** SO₂ & NH₃ concentrations are within the prescribed values at all monitored stations. **Benzene has exceeded the stipulated limit at one station and NO_x has exceeded the permissible limit at 7 monitored stations.**
- viii. **As per the water quality monitoring data, concentration value of Arsenic, Chromium, Copper, Chloride, TDS, Fluoride, Cadmium and Iron exceeded the permissible limits at specified locations of Surface & Ground Water locations. Besides COD was detected at several stations monitored.** As heavy metals (except iron) concentration in leachate was within specified norms and Chloride and TDS were within the permissible drinking water limits (BIS 10500) at most stations monitored, further analysis was done in terms of COD & Fe concentration levels and following are the observations:
- **High level of COD & Fe reported in Ground water at all three sites in Ground water which may be due to leachate from the dumpsite**
 - **Very High level of COD, Chloride, TDS, TSS, Turbidity reported in surface water body (Bhalswa lake) located within a radius of 0-1 km from Bhalswa site, which may be due to leachate from the dumpsite**

- **High COD values reported in surface water body (Sanjay Lake) located at a distance of 3-5 km from Ghazipur site. Owing to the distance from the site, actual impact due to dumpsite can be confirmed based on the hydrogeology of the region and contaminant transport modelling**
 - **Fluctuating trend in Iron & COD concentration in ground water observed within 5 km radius at the three sites. Overall increase in Iron and COD levels observed with increase in distance from the dumpsites, indicating, marginal impact on ground water quality due to dumpsite within 5 km distance from dumpsite**
 - **Ground water outside 5 km radius have reported higher value of COD & Fe than stations located within 5 km radius, indicating minimal impact of dumpsite on ground water quality. Local factors are contributing in deterioration in water quality at these stations**
 - **As several sources of water pollution including open drains observed in these regions, actual impact of the local sources as well as that of the dumpsite can be confirmed based on the hydrogeology of the region and contaminant transport modelling**
- ix. *There are currently 37 Continuous Air Quality monitoring locations in Delhi, of which 10 are located within a distance of 5 km from the dumpsites.*
- x. *Range in variation in PM2.5 & PM10, NOx & Benzene concentration levels within 5 km overlaps the range observed for stations located at distance greater than 5 km from dumpsites. Fluctuating trend is observed in NOx /Benzene concentration levels vis-a-vis distance from the dumpsite.*
- xi. *Several local factors such as drains, road dust, vehicular pollution, C&D waste etc. also contribute towards air & water pollution in the region.*
As per analysis of air and water quality carried out, deterioration in environmental quality cannot be attributed directly to the various activities happening at the

dumpsites. As further detailed investigations are required to assess actual impact of the dumpsite related activities on the environment (air, water & soil quality), interim cost of damage to environment is based on the Environmental Compensation to be levied for violation of Solid Waste Management Rules, 2016. Cost of damage to environment has been calculated based on the Environmental Compensation to be levied for violation of Solid Waste Management Rules and has been assessed as Rs.155.9 Crore (for Bhalswa), Rs. 142.5 Crore (for Ghazipur) and Rs. 151.1 Crore (for Okhla).

- xii. Source apportionment studies are required to assess the actual impact of air pollution sources at dumpsite on air quality in the region.*
- xiii. Detailed hydrogeological investigations and containment transport modelling is required to assess the impact of dumpsites on surface / ground water.”*

8. As shown above, in O.A. No. 514/2018, damage to the environment was assessed at Rs. 148.46 crores for Air pollution, Water pollution, Soil pollution, Climatic (GHG emissions) and Aesthetics has been taken into consideration in the report and damage cost to environment is estimated at Rs 148.46 crores. The report has following conclusions:-

“7. Results & Conclusion

The report focuses on identifying and estimating monetary losses (in 2019 Rupees) on the environment due to the operation of Bandhwari municipal dumpsite. The damage was assessed with a consideration that there is no major polluting industries existing in nearby vicinity other than the dumpsite. The study estimates a total incurred damage of about ₹ 148.46 Crore due to externalities from Bandhwari dumpsite. The breakup is shown in Table 22. The cost for damages includes drivers of externalities like greenhouse gas emissions, air pollution, water pollution, soil pollution and aesthetic loss.

Table 22: Break Up of Monetary Estimation of Damages (reported in 2019 values)

Environment	Estimated Damage Cost in Lakhs, INR
Air	Nil
Water	2900

Soil	31*
Climatic (for last 5 years)	7,000
Aesthetic	4,946
Total	14,846

**Soil value is not considered in total, to avoid double-counting, as it based on total quantum of heavy metal from leachate which is considered in water as well.*

The valuation of damages is done for greenhouse gas emissions using social cost of carbon approach recommended by USEPA. The social cost of carbon is indirect measure of loss in economy due to emission of CO₂ and is contributing by 73% of total damage due to Bandhwari municipal dumpsite. Air pollution damages are not valued as the emissions hardly breach the limits and the area in which emissions are higher, no population exposure is there. Further, the leachate contaminated groundwater and soil damages are valued using cost transfer method and Extern report valuations. Groundwater sample analysis shows lead and nickel exceeding the BIS standards at sampling locations near the dumpsite. Groundwater beneath the dumpsite showed high contamination due to heavy metals such as Cr, Cu, Pb & Ni. Physiochemical characteristics such as BOD, COD, SS, N, P of the treated leachate showed higher concentration and have contributed to half of the total damage cost in water environment. The leachate is valued for the damages which it can cause due to contamination of soil and water. The damages to water are considered as overall damages. The total quantum of heavy metals due to leachate is fixed and is used for valuation for both soil and water, however, higher damages are seen for water and hence considered in total. Aesthetic losses due to dumpsite are valued using hedonic pricing method. GHG emissions are a part and parcel of any dumpsite. If proper control systems are kept in place these emissions can be controlled and may be utilized as well and hence maximum damages can be averted. Leachate also should be controlled and treated scientifically.”

30. In view of above, since statutory timelines for remediation of legacy waste have expired on 07.04.2021, liability of the State for past violations has to be quantified on ‘Polluter Pays’ principle to be utilised for restoration of the environment. State Government is free to raise fund from contributors of waste in an appropriate manner. Suitable mechanism be

laid down in two months such as user charges by households/contribution of corporate, business sectors, commercial establishments who contribute to waste. Further steps have to be taken in a mission mode to comply with MSW Rules without further delay.

31. We have also noted that 12 Million Tonnes legacy waste has been capped at Jawaharnagar dumpsite by the Greater Hyderabad Municipal Corporation (GHMC). As per Solid Waste Management Rules (Rule 15(zj), potential of bio-mining and bio-remediation has to be first explored before resorting to capping. Similarly, as per para J of Schedule I to the Rules (giving specifications of sanitary landfills), option of bio-mining has to be first explored which has not been done. As the Tribunal has earlier held, such capping is not permissible. It is not clear whether CPCB guidelines have been looked into before capping in the present case and whether such capping has prejudiced the environment irreversibly. We direct CPCB to examine this aspect in consultation with the concerned Experts and determine whether capping can be retained and if not what further course of action is to be taken for protection of environment. The State is expected to follow the advice of the CPCB in the matter, subject to any grievance against such advice being raised before the Tribunal. CPCB may finalise its viewpoint in the matter within two months.

32. **On the issue of liquid waste/sewage**, gap mentioned is 1824 MLD in generation of sewage and utilized capacity of the existing STPs. Further, there is no information about compliance status with respect to the laid down standards for results at the outlets of STPs. There may also be unauthorised colonies where sewage is generated and remains untreated which has not been taken into account. Timeline for the establishing requisite treatment systems in terms of judgment of Hon'ble Supreme

Court in *Paryavaran Suraksha vs. Union of India*, supra has long expired. This Tribunal had also directed that for delay after 01.04.2020, coercive measures are to be taken. Till the gaps are bridged, untreated liquid waste will continue to remain source of degradation of environment and damage to public health, including deaths and diseases which the society can ill afford. Hence, the urgency of the situation for good governance for ensuring emergent measures in public interest to protect the environment, natural resources and public health as per mandate of the Constitution. We have to levy compensation for continuing violation on polluter pays principle to be utilised for restoration measures following suggestive mechanism given in para 30.

33. As already noted and also observed in the judgement of the Hon'ble Supreme Court in *Paryavaran Surakhsha*, supra, quoted earlier, the matter falls in 11th and 12th Schedules to the Constitution. It is constitutional responsibility of the State and the Local Bodies to provide pollution free environment and to arrange necessary funds from contributors or others. Being part of right to life, which is also basic human right and absolute liability of the State, lack of funds cannot be plea to deny such right. While there may be no objection to any central funds being availed, the State cannot avoid its responsibility or delay its discharge on that pretext. In this context, it may also be mentioned that viability of policy of freeship of water, if any, without considering available options for ensuring waste treatment capacity need review. Providing clean air, clean water, hygiene and environment have to be the top most priorities for good governance.

34. It is a matter of concern that even after 48 years of enactment of Water (Prevention and Control of Pollution) Act, 1974 and expiry of

timelines for taking necessary steps for solid waste management in terms of Solid Waste Management Rules, 2016 and binding direction in the judgment of the Hon'ble Supreme Court and this Tribunal in *Almitra H. Patel vs. Union of India & Ors.* and *Paryavaran Suraksha vs. Union of India*, supra, huge gaps still exist. Are there insurmountable difficulties for State authorities or lack of will and determination? We find it difficult to believe the first. In our view, it is lack of good governance and determination responsible for the situation which needs to be remedied soonest.

35. We have suggested change in approach in realizing that remedial action cannot wait for indefinite period as is being proposed by the Administration. Sources of funding are laid down in the orders of the Hon'ble Supreme Court. Responsibility of the State is to have comprehensive plan to control pollution which is its absolute liability, which is not being understood. If there is deficit in budgetary allocations, it is for the State and state alone to have suitable planning by reducing cost or augmenting resources. By way of suggestion, one may consider harnessing traditional knowledge and community involvement. People must be involved in the problem by appropriate awareness and strategies to encourage public participation and contribution. At the cost of repetition, health issues cannot be deferred to long future. Long future dates which, breach of which is established from the track record of last several decades, is not convincing solution. There is no accountability for the past breaches. It is poor substitute for compliance. This approach may project lack of concern or not realizing the grim ground situation crying for emergent remedial measures on priority. There is no time for leisure, reflected in timelines proposed for bridging the acknowledged gaps.

36. It is the mindset and determination to act in a mission mode which can produce results.

37. While addressing the issue on bridging the gap in management of MSW, segregation of the solid waste at source particularly by the bulk generators and its earliest processing nearest to the point of generation with defined destination is imperative. In particular, adequate composting/vermicomposting/bio-methanation centers need to be set up and upgraded nearest to the source of generation of wet solid waste, listing people's involvement. Waste generators can themselves be required to process the waste under guidance and handholding by the Administration, with the assistance of identified empaneled service providers and such details may be posted on State's/Center's GeM portal. This may perhaps reduce planned expenditure. In order to reduce the gap in waste generation and processing, option of waste energy projects for bigger cities or at regional/cluster level needs consideration. The proposed cluster approach presented today for 129 ULBs to process 2974 TPD of waste with keeping environmental safety issues may be operationalized expeditiously.

38. Similarly, sewage can be required to be processed by cost-effective methods at least at several identified locations with least expenses. Decentralized and the prefabricated/modular treatment plants can be explored, apart from imposing condition of ZLD on industries, Group Housing Societies etc. Reduced load can be processed partly with the help of water using commercial establishments requiring water for their processes enforcing consent conditions in CTEs and CTOs whereby State's financial burden can be reduced. In this context, the draft Notification of MoEF&CC dated 25.02.2022⁸ etc. and the relevant part of the draft

⁸ https://www.compfi.com/wp-content/uploads/2022/03/01032022_EHS_02.pdf

Notification in context of sewage and solid waste management is reproduced below:

“xxx xxx.....xxx

C. Management of sewage/waste water, Reuse and recycle of treated wastewater by dual plumbing system

10. Dual Plumbing System shall be implemented - one for supplying fresh water for drinking, cooking and bathing etc. and another for supply of treated water for flushing.

11. Only treated water shall be used for flushing.

12. In no case, sewage or untreated waste water generated within the project area shall be discharged through storm water drains or otherwise into water bodies nor discharged/injected into the ground water by any mode.

13. Subject to Clause (3) of this notification, the project authority may opt or avail to common off-site treatment facility, as feasible, for treatment with reuse & recycle of corresponding quantity of treated water through the dual plumbing system for flushing and other non-potable use.

A. For projects with built up area of 5,000 sq. mtrs. to 20,000 sq. mtrs. –

i. In areas where there is no municipal sewage network,

a. Either Onsite Sewage Treatment Systems with capacity to treat 100% waste water may be installed with appropriate tertiary treatment system with disinfection for black & grey water. Such treated water should be used with dual plumbing system for flushing and other non-potable use;

OR

b. In case of usage of septic tank, only black water shall be discharged in the septic tank. Grey water may be treated through natural treatment systems or other secondary treatment as feasible. Such treated water should be used with dual plumbing system for flushing and other non-potable use;

The excess treated water should conform to the general discharge norms of CPCB/MoEF&CC.

ii. In areas where there is municipal sewage network

- a. Either Onsite Sewage Treatment Systems with capacity to treat 100% waste water may be installed with appropriate tertiary treatment system with disinfection for black & grey water. Such treated water should be used with dual plumbing system for flushing and other non-potable use;*

OR

- b. The project authority may opt to discharge only black water in such municipal sewage network subject to availability of trunk sewer line. For this purpose, two separate pipeline network– one for black water discharge and other for collection of grey water shall be installed. Grey water may be treated through natural treatment systems or other secondary treatment as feasible. Such treated water should be used with dual plumbing system for flushing and other non-potable use;*

B. For projects involving built-up area of 20,000 sq. mts. or more –

14. Subject to Clause (3) of this notification, Onsite Sewage Treatment Plant with capacity to treat 100% waste water generated within the project area through tertiary treatment shall be installed. Treated waste water shall be reused on site for landscape, flushing, HVAC, fire-fighting, and other end-uses.

15. The adequacy of the Sewage Treatment Plant (STP) shall be certified by an independent expert and a report in this regard shall be submitted to the authorized agency.

16. Discharge of excess treated wastewater outside the premises, after treatment in STP, should meet the discharge standards as notified by CPCB/MoEF&CC from time to time.

17. Wastewater and treated water quantification system through metering/ sub-metering shall be installed.

18. Sludge from the onsite sewage treatment shall be collected, conveyed and disposed as per the Central Public Health and Environmental Engineering Organization (CPHEEO) Manual, Ministry of Housing and Urban Affairs, on Sewerage and Sewage Treatment Systems.

19. Where Common Sewage Treatment Plant facility has been availed, it shall be ensured that treated waste water is recycled back to respective building for reuse.

D. Solid Waste Management

20. Subject to Clause (3) of this notification, onsite solid waste management facility should be developed and a formal contractual arrangement shall be ensured with authorized recyclers/concerned municipal agency for disposal of all non-biodegradable waste.

21. Subject to Clause (3) of this notification, where there is no alternate arrangement for disposal of biodegradable waste, Organic waste composter/Vermiculture pit with a minimum capacity of 1.0 kg/150 sqm. of built-up area/day shall be installed & operated.”

39. We also find that sanctity of natural storm water drains needs to be maintained. Storm water drains, if left unpolluted, can be source of drinking water for humans, birds, animals or aquatic life and discharge of sewage or even treated water which is not of standard of drinking water seriously affects such drinking water resource adversely affecting their health. Failure of duties of the State on this aspect has resulted in rivers like Musi in Hyderabad becoming channel to carry sewerage which needs to be remedied. Sewage should be separately managed without mixing it in storm water drains/rivers/waterbodies. The Tribunal has comprehensively dealt with this issue on 03.08.2022 in OA No. 1002/2018, *Abhisht Kusum Gupta vs. State of Uttar Pradesh & Ors.*

40. Efforts are also required on utilization of treated sewage such as by establishments like malls, industrial estates, automobile establishments, power plants, playgrounds, railways, bus stands, local bodies, universities etc. to save potable water for drinking. The treated sewage can be utilized for industrial/agricultural/other non-drinking uses like washing railway

wagons/yards, buses, roads, water sprinkling and several such models reportedly exist⁹.

41. We have noted that C&D processing plants are set up by GHMC. Three plants (with 240 TPD capacity) are proposed on cluster basis. 1356 TPD of plastic waste is being generated which is processed through recycling, co-processing in cement kilns, production of waste oil and utilizing as RDF.

42. Thus, it may be necessary to brain storm with available experts and other stake holders in the State at different levels, evolve models for both solid and sewage management which can be fast replicated, initiate special campaigns with community/media involvement in the larger interest of protecting environment and public health with determination for prompt action. Such brain storming sessions may enable capacity enhancement of the regulators and the processes. Campaigns and community involvement may result in reducing the financial and administrative load on the administration.

⁹ <https://www.newindianexpress.com/cities/chennai/2019/jul/31/chennai-industries-to-now-use-treated-sewage-water-2011837.html>
<https://timesofindia.indiatimes.com/city/surat/surat-water-reuse-model-goes-global/articleshow/85668103.cms>
<https://www.aninews.in/news/national/general-news/surat-generating-massive-revenue-by-selling-treated-water-to-industries20201217051127/>
<https://swachhindia.ndtv.com/surat-generating-massive-revenue-by-selling-treated-water-of-river-tapi-to-industries-54411/>
https://m.timesofindia.com/city/ahmedabad/amc-offers-rs43/kl-treated-wastewater-for-industries/amp_articleshow/87169850.cms <https://theprint.in/india/governance/nagpur-to-become-the-first-indian-city-to-treat-and-reuse-90-of-its-sewage/180493/>
https://www.business-standard.com/content/press-releases-ani/india-s-1st-and-largest-ppp-on-waste-water-reuse-completed-in-record-time-during-pandemic-bags-ficci-water-award-2020-121022500841_1.html
https://mpcb.gov.in/sites/default/files/focus-area-reports-documents/NMC_%26_KTPS_success_story_28052019.pdf
<https://cpcb.nic.in/success-stories/upload/1501156301.pdf>
http://cpheeo.gov.in/upload/uploadfiles/files/engineering_chapter7.pdf

43. Compliance of environmental norms on the subject of waste management has to be on high on priority. It is high time that the State realizes its duty to law and to citizens and adopts further monitoring at its own level.

Conclusion with hope for future remedial action

44. **We hope in the light of interaction with the Chief Secretary, the State of Telangana will take further measures in the matter by innovative approach, stringent monitoring at appropriate level, including at the level of the District Magistrates (who execute the District Environment Plans) and the Chief Secretary, ensuring that the gap in solid and liquid waste generation and treatment is bridged at the earliest, shortening the proposed timelines, adopting alternative/interim measures to the extent and wherever found viable.** The State may devise an operative mechanism by which service providers with due diligent process can execute work relating to solid and sewage management simultaneously throughout the State – all districts, cities and towns. Considering the environment compensation imposed for restoration dovetailed with the State budget and availability of confirmed sites, there should not be any difficulty in execution without delay.

45. The Chief Secretary may consider designating a Senior Nodal Officer at the rank of ACS to regularly assess the progress in bridging the gaps in sewage and solid waste management and establishing stocktaking at the district levels. Existing and upcoming STPs need to have linkages with industries and other bulk users including Agriculture/horticulture for using treated sewage. Legacy waste sites need to be remediated and reclaimed areas utilized for setting up of waste processing plants so to process day-to-day waste generation. More and more green belts/dense

forests need to be set up to mitigate adverse impact of waste. Based on the gained experience, standardized processing and treatment methodologies be replicated for areas of other Corporations, Municipalities and Panchayats. Alongwith the cluster approach, it appears to be necessary to deal with the bigger towns with population of more than one lakh like Hyderabad, Warangal, Nizamabad, Khammam, Karimnagar, Ramagundam, Mahabubnagar, Nalgonda, Adilabad, Suryapet, Miryalaguda, Siddipet, Jagtial on separate footing for sewage and solid waste management.

46. Laid down statutory norms need to be complied as per prescribed timelines and directions in the judgments of Hon'ble Supreme Court and this Tribunal, including directions in orders dated 25.4.2019, 28.2.2020 and 14.12.2020 and other orders in individual cases. In the light of observations in paras 14, 19 and 22 above, accountability be fixed for erring officers and compensation collected and utilised, as already directed.

Need for monitoring by NMCG and MoUD for centrally assisted/sponsored schemes

47. In view of continuing huge gap in solid and liquid waste generation and treatment, it is high time that Ministry of Housing and Urban Development (MoUD) and National Mission for Clean Ganga (NMCG) who have programmes like Swachh Bharat Mission (SBM), AMRUT - 1 and 2.0 and River Cleaning, appropriately monitor compliance of waste management norms by concerned States and take remedial action on their part. Central Funding and State budgetary provisions need to be adequately allocated and apportioned keeping in view of environment compensation which is based on the restoration work estimate. While

granting/disbursing funds to States, execution mechanism for centralized tendering at the State level to overcome delays at each city/town level may be considered. This may facilitate timely utilization of funds. MoEF&CC and CPCB may continue monitoring as per MSW Rules and the Water Act.

Determination of liability for compensation for restoration of environment

48. **Apart from compliance in future, the liability of the State has to be fixed for the past violations in the light of earlier binding orders passed in pursuance of orders of Hon'ble Supreme Court dated 2.9.2014 in WP 888/1996, Almitra Patel and dated 22.2.2017 in WP 375/2012, Paryavaran Suraksha. Order dated 22.12.2016 in Almitra Patel clearly laid down liability for compensation for breach of statutory timelines. Similarly, liability for compensation was laid down for failing to install water pollution control devices after 31.3.2020.** The Tribunal has to follow 'Polluter Pays' principle under Section 20 of the NGT Act. The State Authorities contributing to the pollution by failing in their constitutional duties are to be held accountable on this principle. Admittedly, timelines under Supreme Court orders and orders of this Tribunal for preventing water pollution and statutory timelines for solid waste management are over. Thus, atleast from 01.01.2021, the 'Polluter Pays' principle has to be applied. Compensation has to be equal to the loss to the environment and also taking into account cost of remediation.

49. In our recent order dated 01.09.2022 in O.A No. 606/2018 (in respect of State of West Bengal), considering scale of compensation adopted in earlier cases including in OA No. 1002/2018, *Abhisht Kusum Gupta vs. State of Uttar Pradesh & Ors.*, compensation was determined @

Rs. 2 Crore per MLD for untreated liquid waste and in OA No. 286/2022 for unprocessed legacy waste compensation was fixed @ Rs. 300 per MT to be utilized for restoration measures, including preventing discharge of untreated sewage and solid waste treatment/processing facilities, as per appropriate mechanism for planning and execution that may be evolved, within three months. Operative part of the said order is reproduced below:-

“Conclusion about quantum of compensation

*49. In the light of above and considering damage to the recipient environment, we hold that apart from ensuring compliance at the earliest, compensation has to be paid by the State for past violations. The amount of compensation is fixed @ Rs. 2 crore per MLD (at which rate compensation has been levied against Noida and DJB in OA No. 1002/2018, Abhisht Kusum Gupta vs. State of Uttar Pradesh & Ors, referred to in para 48 above for detailed reasons mentioned therein). As noted earlier, **gap in generation and treatment in West Bengal, as per data furnished is 1490 MLD. Thus, under this head, liability of the State of West Bengal is to pay compensation of Rs. 2980 crores, rounded off to Rs. 3000 crore in view of continuing damage. For failure to process solid waste, unprocessed legacy waste being 1.20 crore MT, compensation is assessed @ Rs. 300 per MT (at which approximate rate compensation has been awarded in OA No. 286/2022 against Municipal Corporation, Ludhiana, for the reasons given therein). This works out to Rs. 366 crore but adding 134 crore for continuing addition of unprocessed waste @ 13469.19 TPD, the total amount is rounded off to Rs. 500 crore. Thus, final amount of compensation under the two heads (solid and liquid waste) is assessed at Rs. 3500 crores which may be deposited by the State of West Bengal in a separate ring-fenced account within two months, to be operated as per directions of the Chief Secretary and utilised for restoration measures, including preventing discharge of untreated sewage and solid waste treatment/processing facilities, as per appropriate mechanism for planning and execution that may be evolved, within three months. If violations continue, liability to pay additional compensation may have to be considered. Compliance will be the responsibility of the Chief Secretary.”***

Finding about quantum of compensation by Telangana and its utilisation for restoration measures

50. Following the above pattern, we determine compensation payable by the State of Telangana. In respect of **gap in treatment of liquid waste/ sewage i.e. 1824 MLD, compensation works out to Rs. 3648/- crores.**

Un-remediated legacy waste is to the extent of 5.9 Million MT. The total compensation under the head of failure to scientifically manage solid waste works out to Rs. 177 crores. The total compensation comes to Rs 3825 crores, or say Rs. 3800 crores, which may be deposited by the State of Telangana in a separate ring-fenced account within two months, to be operated as per directions of the Chief Secretary and utilised for restoration measures. It will be open to the State to plan raising funds from generators/contributors to waste.

51. **The restoration measures with respect to sewage management** would include: setting up of sewage treatment and utilization systems, upgrading systems/operations of existing sewage treatment facilities to ensure utilization of their full capacities, ensuring compliance of standards, including those of fecal coliform and setting up of proper fecal sewage and sludge management in rural areas.

52. **With regard to solid waste management**, the execution plan would include setting up of required waste processing plants and remediation of left out sites. Bio-remediation/bio-mining process need to be executed as per CPCB guidelines and the stabilized organic waste from biomining as well as from compost plants need to comply with laid down specifications. Other material recovered during such processes are to be put to use through authorized dealers/handlers/users.

53. The restoration plans need to be executed at the earliest simultaneously in all districts/cities/ towns/ villages in a time bound manner without further delay. If violations continue, liability to pay additional compensation may have to be considered. Compliance will be the responsibility of the Chief Secretary for which a Special Senior Level

Nodal Secretary with team of technical experts may be deputed immediately.

54. Award of above compensation has become necessary under section 15 of the NGT Act to remedy the continuing damage to the environment and to comply with directions of the Hon'ble Supreme Court requiring this Tribunal to monitor enforcement of norms for solid and liquid waste management. Moreover, without fixing quantified liability necessary for restoration, mere passing of orders has not shown any tangible results in the last eight years (for solid waste management) and five years (for liquid waste management), even after expiry of statutory/laid down timelines. Continuing damage is required to be prevented in future and past damage is to be restored.

Directions for further follow up

55. Further, six monthly progress reports with verifiable progress may be filed by the Chief Secretary with a copy to the Registrar General of this Tribunal 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. Copies thereof may be furnished to the NMCG, MoUD and CPCB and also be placed on the website of the State Government. CPCB may file a separate report in the light of observations in Para 31 above by e-mail.

A copy of this order be forwarded for compliance to the Chief Secretary, Telangana, Secretary, Ministry of Housing and Urban Development, MoEF&CC, GoI, National Mission for Clean Ganga and CPCB.

On report being filed with the Registrar General of this Tribunal, the same may be placed before the Bench, if found necessary.

If any grievance survives, it will be open to the aggrieved parties to take further remedies as per law.

Adarsh Kumar Goel, CP

Arun Kumar Tyagi, JM

Prof. A. Senthil Vel, EM

Dr. Afroz Ahmad, EM

September 29, 2022
Original Application No. 606/2018

**BEFORE THE NATIONAL GREEN
TRIBUNAL (SOUTHERN ZONE)
CHENNAI**

**Original Application No 199 of 2021 (SZ)
& I. A No. 96 of 2022 (SZ)**

IN THE MATTER OF:

Sri Shankar Narayana Bala Krishna
& Ors ... Applicant (s)

Versus

State of Telangana & Ors

..... Respondent (S)

**ACTION TAKEN REPORT IN
COMPLIANCE TO HON'BLE NGT
ORDER DATED 15/07/2024 ON
BEHALF OF THE CENTRAL
POLLUTION CONTROL BOARD
(CPCB), RESPONDENT NO. 3**

Advocate N Nathami

COUNSEL FOR CPCB